

WSR 20-16-001
EXPEDITED RULES
DEPARTMENT OF HEALTH
 (Board of Naturopathy)
 [Filed July 22, 2020, 12:04 p.m.]

Title of Rule and Other Identifying Information: WAC 246-836-410 (naturopathic physicians) AIDS prevention and information education requirements, the board of naturopathy (board) is considering repealing WAC 246-836-410 as required by ESHB 1551 Modernizing the control of certain communicable diseases (chapter 76, Laws of 2020).

Purpose of the Proposal and Its Anticipated Effects, Including Any Changes in Existing Rules: ESHB 1551 requires the board to repeal rules that require HIV/AIDS education and training as a condition for licensure.

Section 22, paragraph (11) of ESHB 1551 repeals RCW 70.24.270 Health professionals—Rules for AIDS education and training. This repeal no longer requires health professionals to obtain AIDS education and training. As a result, the board proposes to repeal the requirement for AIDS training in WAC 246-836-410.

The intent of ESHB 1551 is to help reduce stigma toward people living with HIV/AIDS by not singling out AIDS as an exceptional disease requiring special training and education separate from other communicable health conditions.

Reasons Supporting Proposal: When Washington adopted statutes concerning AIDS, very little was known about the disease compared to today. Now, AIDS is very treatable and preventable. In 2014, Governor Inslee issued a proclamation which included efforts to reduce stigma, which included updating state law. ESHB 1551 repeals statutes concerning AIDS education and training for emergency medical personnel, health professionals, and health care facility employees, which helps reduce stigma towards people living with HIV/AIDS by not singling out AIDS as an exceptional disease that requires specific training and education separate from other communicable health conditions.

Statutory Authority for Adoption: RCW 18.36A.160.

Statute Being Implemented: ESHB 1551 (chapter 76, Laws of 2020).

Rule is not necessitated by federal law, federal or state court decision.

Name of Proponent: Washington state board of naturopathy, governmental.

Name of Agency Personnel Responsible for Drafting, Implementation, and Enforcement: Susan Gragg, 111 Israel Road S.E., Tumwater, WA 98501, 360-236-4941.

This notice meets the following criteria to use the expedited repeal process for these rules:

The statute on which the rule is based has been repealed and has not been replaced by another statute providing statutory authority for the rule.

Explanation of the Reason the Agency Believes the Expedited Rule-Making Process is Appropriate: ESHB 1551 repeals RCW 70.240.270, which requires the board of naturopathy to also repeal a rule to implement the bill.

NOTICE

THIS RULE IS BEING PROPOSED UNDER AN
 EXPEDITED RULE-MAKING PROCESS THAT WILL

ELIMINATE THE NEED FOR THE AGENCY TO HOLD PUBLIC HEARINGS, PREPARE A SMALL BUSINESS ECONOMIC IMPACT STATEMENT, OR PROVIDE RESPONSES TO THE CRITERIA FOR A SIGNIFICANT LEGISLATIVE RULE. IF YOU OBJECT TO THIS USE OF THE EXPEDITED RULE-MAKING PROCESS, YOU MUST EXPRESS YOUR OBJECTIONS IN WRITING AND THEY MUST BE SENT TO Susan Gragg, Department of Health, P.O. Box 47852, Olympia, WA 98504-7852, phone 360-236-4941, fax 360-236-2901, email <https://fortress.wa.gov/doh/policyreview>, AND RECEIVED BY October 5, 2020.

June 11, 2020
 Chad Aschtgen, ND
 Chair

REPEALER

The following section of the Washington Administrative Code is repealed:

WAC 246-836-410 AIDS prevention and information education requirements.

WSR 20-16-045
EXPEDITED RULES
DEPARTMENT OF HEALTH
 (Pharmacy Quality Assurance Commission)
 [Filed July 27, 2020, 1:26 p.m.]

Title of Rule and Other Identifying Information: Chapters 246-856, 246-858, 246-860, 246-863, 246-865, 246-867, 246-869, 246-870, 246-871, 246-873, 246-874, 246-875, 246-877, 246-878, 246-879, 246-881, 246-883, 246-885, 246-886, 246-887, 246-888, 246-889, 246-891, 246-895, 246-897, 246-899, 246-901 (except for WAC 246-901-061), 246-903, 246-904, and 246-905 WAC. The pharmacy quality assurance commission (commission) consolidated multiple chapters of rules into one chapter, chapter 246-945 WAC, that covers the practice of pharmacy. The commission is proposing to repeal the old chapters relating to the practice of pharmacy.

Purpose of the Proposal and Its Anticipated Effects, Including Any Changes in Existing Rules: The commission recently completed a two and a half year process to consolidate its thirty-three separate chapters of WAC into one new chapter, chapter 246-945 WAC. The proposal repeals the chapters of rules relating to pharmacy that were replaced by chapter 246-945 WAC, with the exception of the continuing education (CE) sections (chapter 246-861 WAC and WAC 246-901-061), which have a delayed effective date in the new chapter to align with rule making currently in progress regarding fees collected by the commission.

When the commission began its rules rewrite project, the commission created four separate rule-making packages to divide the rule-making process into four parts. The repeal language was going to be filed in each of the four separate rule-making packages so that there would be no gaps in

implementation of rules for the practice of pharmacy. However, the commission decided to combine all four parts into the same rule rewrite process. When the four parts were rolled up into one rule-making package, the repeal language was not added in at that point. Therefore, although it was the commission's intention to repeal the old WAC when they adopted chapter 246-945 WAC, the old rules must be repealed separately. The proposal simply repeals the thirty-three [thirty] chapters of rule that the new WAC replaced, adding clarity for licensees and the public.

Reasons Supporting Proposal: Without repealing the WAC chapters replaced by chapter 246-945 WAC, both sets of rules will be codified at the same time and could lead to confusion. The commission issued a policy statement to help clarify, but the repeal of the old WAC chapters replaced by chapter 246-945 WAC is necessary to avoid confusion and complete the goal of simplifying and streamlining regulations relating to the practice of pharmacy.

Statutory Authority for Adoption: RCW 18.64.005, 18.64.080, 18.130.075, 18.64.043, 18.64.044, 18.64.045, 18.64.046, 18.64.370, 18.64.460, 69.50.310, 18.64.011, 18.64.245, 18.64.470, 18.64.255, 18.64.205, 18.64.253, 18.64.410, 18.64.500, 18.64.590.

Statute Being Implemented: RCW 18.64.005.

Rule is not necessitated by federal law, federal or state court decision.

Name of Proponent: Washington state pharmacy quality assurance commission, governmental.

Name of Agency Personnel Responsible for Drafting, Implementation, and Enforcement: Lindsay Trant, 111 Israel Road S.E., Tumwater, WA 98501, 360-236-2932.

This notice meets the following criteria to use the expedited repeal process for these rules:

Other rules of the agency or of another agency govern the same activity as the rule, making the rule redundant.

Explanation of the Reason the Agency Believes the Expedited Rule-Making Process is Appropriate: The commission has adopted a new chapter that consolidates the old chapters making the old chapters redundant. Other rules of the agency govern the same activity as the chapters this package proposes to repeal.

NOTICE

THIS RULE IS BEING PROPOSED UNDER AN EXPEDITED RULE-MAKING PROCESS THAT WILL ELIMINATE THE NEED FOR THE AGENCY TO HOLD PUBLIC HEARINGS, PREPARE A SMALL BUSINESS ECONOMIC IMPACT STATEMENT, OR PROVIDE RESPONSES TO THE CRITERIA FOR A SIGNIFICANT LEGISLATIVE RULE. IF YOU OBJECT TO THIS USE OF THE EXPEDITED RULE-MAKING PROCESS, YOU MUST EXPRESS YOUR OBJECTIONS IN WRITING AND THEY MUST BE SENT TO Lindsay Trant, Pharmacy Quality Assurance Commission, P.O. Box 47852, Olympia, WA 98504, phone 360-236-2932, fax 360-236-2321, email <https://fortress.wa.gov/doh/policyreview>, AND RECEIVED BY October 5, 2020.

May 29, 2020

Tim Lynch, PharmD, MS, Chair
Pharmacy Quality Assurance Commission

REPEALER

The following chapter of the Washington Administrative Code is repealed:

- WAC 246-856-001 Purpose.
- WAC 246-856-020 Adjudicative proceedings—Procedural rules for the board of pharmacy.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

- WAC 246-858-020 General requirements.
- WAC 246-858-030 Registration of interns.
- WAC 246-858-040 Rules for the pharmacy intern.
- WAC 246-858-050 Intern training reports.
- WAC 246-858-060 Requirements for preceptor certification.
- WAC 246-858-070 Rules for preceptors.
- WAC 246-858-080 Special internship approval.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

- WAC 246-860-010 Purpose of chapter.
- WAC 246-860-020 Definitions.
- WAC 246-860-100 Sexual misconduct.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

- WAC 246-863-020 Examinations.
- WAC 246-863-030 Applicants—Reciprocity applicants.
- WAC 246-863-035 Temporary permits.
- WAC 246-863-040 Foreign-trained applicants.
- WAC 246-863-060 Licensed pharmacists—Employed as responsible managers—Duty to notify board.
- WAC 246-863-070 Inactive credential.
- WAC 246-863-080 Retired pharmacist license.
- WAC 246-863-090 Expired license.
- WAC 246-863-095 Pharmacist's professional responsibilities.

- WAC 246-863-100 Pharmacist prescriptive authority—
Prior board notification of written
guideline or protocol required.
- WAC 246-863-110 Monitoring of drug therapy by pharma-
cists.
- WAC 246-863-120 AIDS prevention and information edu-
cation requirements.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

- WAC 246-865-010 Definitions.
- WAC 246-865-020 Promulgation.
- WAC 246-865-030 Emergency kit.
- WAC 246-865-040 Supplemental dose kits.
- WAC 246-865-050 Drug facilities.
- WAC 246-865-060 Pharmaceutical services.
- WAC 246-865-070 Provision for continuity of drug therapy
for residents.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

- WAC 246-867-001 Purpose and scope.
- WAC 246-867-010 Definitions.
- WAC 246-867-020 Applicability.
- WAC 246-867-030 Reporting and freedom from liability.
- WAC 246-867-040 Approval of substance abuse monitor-
ing programs.
- WAC 246-867-050 Participation in approved substance
abuse monitoring program.
- WAC 246-867-060 Confidentiality.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

- WAC 246-869-010 Pharmacies' responsibilities.
- WAC 246-869-020 Pharmacies and differential hours.
- WAC 246-869-030 Pharmacy license notice requirements.
- WAC 246-869-040 New pharmacy registration.
- WAC 246-869-060 Employers to require evidence of phar-
macist's qualifications.
- WAC 246-869-070 Responsible manager—Appointment.
- WAC 246-869-080 Clinic dispensaries.
- WAC 246-869-090 Prescription transfers.
- WAC 246-869-100 Prescription record requirements.

- WAC 246-869-105 Continuity of care refills in proclaimed
emergencies.
- WAC 246-869-110 Refusal to permit inspection.
- WAC 246-869-130 Return or exchange of drugs.
- WAC 246-869-140 Prescription department—Conversing
with pharmacist prohibited.
- WAC 246-869-150 Physical standards for pharmacies—
Adequate stock.
- WAC 246-869-160 Physical standards for pharmacies—
Adequate facilities.
- WAC 246-869-170 Physical standards for pharmacies—
Sanitary conditions.
- WAC 246-869-180 Physical standards for pharmacies—
Adequate equipment.
- WAC 246-869-190 Pharmacy inspections and self-inspec-
tion worksheets.
- WAC 246-869-200 Poison control.
- WAC 246-869-210 Prescription labeling.
- WAC 246-869-220 Patient counseling required.
- WAC 246-869-230 Child-resistant containers.
- WAC 246-869-235 Prescription drug repackaging—Defi-
nitions.
- WAC 246-869-250 Closing a pharmacy.
- WAC 246-869-255 Customized patient medication pack-
ages.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

- WAC 246-870-010 Purpose.
- WAC 246-870-020 What definitions do I need to know to
understand these rules?
- WAC 246-870-030 What is included in the electronic trans-
mission and transfer of prescription
information?
- WAC 246-870-040 Can all prescriptions be transmitted
electronically?
- WAC 246-870-050 What are the requirements for fax
machines?
- WAC 246-870-060 What are the board requirements for
electronic prescription transmission
systems?
- WAC 246-870-070 What are the board requirements for
pharmacies using electronic prescrip-
tion transmission systems?
- WAC 246-870-080 Can prescription records be stored elec-
tronically?

WAC 246-870-090 Can electronic mail systems be used to transmit patient information?

REPEALER

The following chapter of the Washington Administrative Code is repealed:

WAC 246-871-001 Scope and purpose.
 WAC 246-871-010 Definitions.
 WAC 246-871-020 Policy and procedure manual.
 WAC 246-871-030 Physical requirements.
 WAC 246-871-040 Personnel.
 WAC 246-871-050 Drug distribution and control.
 WAC 246-871-060 Antineoplastic medications.
 WAC 246-871-070 Clinical services.
 WAC 246-871-080 Quality assurance.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

WAC 246-873-010 Definitions.
 WAC 246-873-020 Applicability.
 WAC 246-873-030 Licensure.
 WAC 246-873-040 Personnel.
 WAC 246-873-050 Absence of a pharmacist.
 WAC 246-873-060 Provision of emergency department discharge medications when pharmacy services are unavailable.
 WAC 246-873-070 Physical requirements.
 WAC 246-873-080 Drug procurement, distribution and control.
 WAC 246-873-090 Administration of drugs.
 WAC 246-873-100 Investigational drugs.
 WAC 246-873-110 Additional responsibilities of pharmacy service.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

WAC 246-874-010 Definitions.
 WAC 246-874-020 General applicability.
 WAC 246-874-025 Responsible manager designation requirement for an ADDD.
 WAC 246-874-030 General requirements for an ADDD.
 WAC 246-874-040 Security and safety requirements for ADDD.

WAC 246-874-050 Accountability requirements for an ADDD.

WAC 246-874-060 Quality assurance process requirements for ADDD.

WAC 246-874-070 Nursing students ADDD access.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

WAC 246-875-001 Purpose.
 WAC 246-875-010 Definitions.
 WAC 246-875-020 Minimum required information in an automated patient medication record system.
 WAC 246-875-030 Minimum required information in a manual patient medication record system.
 WAC 246-875-040 Minimum procedures for utilization of a patient medication record system.
 WAC 246-875-050 Auxiliary recordkeeping procedure.
 WAC 246-875-060 Retrieval of information from an automated system.
 WAC 246-875-070 Confidentiality and security of data.
 WAC 246-875-080 Extension of time for compliance.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

WAC 246-877-020 Drug sample prohibitions.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

WAC 246-878-010 Definitions.
 WAC 246-878-020 Compounded drug products—Pharmacist.
 WAC 246-878-030 Organization and personnel.
 WAC 246-878-040 Facilities.
 WAC 246-878-050 Sterile pharmaceutical.
 WAC 246-878-060 Radiopharmaceuticals.
 WAC 246-878-070 Special precaution products.
 WAC 246-878-080 Equipment.
 WAC 246-878-090 Control of components and drug product containers and closures.
 WAC 246-878-100 Drug compounding controls.
 WAC 246-878-110 Labeling control of excess products.

WAC 246-878-120 Records and reports.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

- WAC 246-879-010 Definitions.
- WAC 246-879-020 Minimum standards for wholesalers.
- WAC 246-879-030 Inspections.
- WAC 246-879-040 Records.
- WAC 246-879-050 Security.
- WAC 246-879-060 Unauthorized sales.
- WAC 246-879-070 Application for full line wholesaler license and over-the-counter only wholesaler license.
- WAC 246-879-080 Application for controlled substance wholesaler license.
- WAC 246-879-090 Export wholesaler.
- WAC 246-879-100 Salvaging and reprocessing companies.
- WAC 246-879-110 Violations and penalties.
- WAC 246-879-120 Reciprocity.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

- WAC 246-881-010 Drug price advertising defined.
- WAC 246-881-020 Drug price advertising conditions.
- WAC 246-881-030 Prohibition on advertising controlled substances.
- WAC 246-881-040 Drug price disclosure—Required.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

- WAC 246-883-020 Identification of legend drugs for purposes of chapter 69.41 RCW.
- WAC 246-883-025 Introductory trade or stock packages.
- WAC 246-883-030 Ephedrine prescription restrictions.
- WAC 246-883-040 Regulated steroids.
- WAC 246-883-050 Theophylline prescription restrictions.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

- WAC 246-885-020 Drug imprint information provided by manufacturers and distributors.

WAC 246-885-030 Over-the-counter (OTC) drug imprint regulation.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

- WAC 246-886-001 Purpose.
- WAC 246-886-010 Definitions.
- WAC 246-886-020 Registration.
- WAC 246-886-030 Approved legend drugs.
- WAC 246-886-035 Sodium pentobarbital—Approved controlled substance.
- WAC 246-886-040 Training of personnel.
- WAC 246-886-050 Legend drug administration.
- WAC 246-886-060 Responsible individuals.
- WAC 246-886-080 Recordkeeping and reports.
- WAC 246-886-090 Drug storage and field use.
- WAC 246-886-100 Violations.
- WAC 246-886-150 Chemical capture programs.
- WAC 246-886-160 Registration requirements.
- WAC 246-886-170 Authorized individuals.
- WAC 246-886-180 Approved legend drugs.
- WAC 246-886-190 Controlled substances training.
- WAC 246-886-200 Storage requirements.
- WAC 246-886-210 Controlled substances records and reports.
- WAC 246-886-220 Approved controlled substances.
- WAC 246-886-230 Controlled substances registration disciplinary actions.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

- WAC 246-887-020 Uniform Controlled Substances Act.
- WAC 246-887-040 Designation of nonnarcotic stimulant drugs for purposes of RCW 69.50.402 (1)(c).
- WAC 246-887-045 Prescribing, dispensing, or administering of Schedule II nonnarcotic stimulants.
- WAC 246-887-080 Sodium pentobarbital registration disciplinary action.
- WAC 246-887-090 Authority to control.
- WAC 246-887-100 Schedule I.
- WAC 246-887-140 Schedule II.
- WAC 246-887-150 Schedule II immediate precursors.

- WAC 246-887-160 Schedule III.
- WAC 246-887-170 Schedule IV.
- WAC 246-887-180 Schedule V.
- WAC 246-887-200 Other controlled substance registrants—Requirements.
- WAC 246-887-210 Standards for transmission of controlled substances sample distribution reports.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

- WAC 246-888-010 Purpose.
- WAC 246-888-020 What is self-administration with assistance and how is it different from independent self-administration or medication administration?
- WAC 246-888-030 How is self-administration with assistance initiated in a community-based care setting or an in-home setting?
- WAC 246-888-045 What is an enabler?
- WAC 246-888-050 How can medications be altered to assist with self-administration?
- WAC 246-888-060 Can all medications be altered to facilitate self-administration?
- WAC 246-888-070 What other type of assistance can a nonpractitioner provide?
- WAC 246-888-080 Is oxygen covered under this rule?
- WAC 246-888-090 If a individual/resident is able to administer his or her own oral medication through a gastrostomy or "g-tube," can a nonpractitioner provide assistance as outlined in these rules?
- WAC 246-888-100 Are there any other requirements I need to be aware of?

REPEALER

The following chapter of the Washington Administrative Code is repealed:

- WAC 246-889-010 Definitions.
- WAC 246-889-020 Precursor substance defined.
- WAC 246-889-030 Reports of precursor receipt.
- WAC 246-889-040 Monthly reporting option.
- WAC 246-889-050 Suspicious transactions and reporting requirements.
- WAC 246-889-070 Retail sales of nonprescription ephedrine, pseudoephedrine, and phenylpropanolamine products.

- WAC 246-889-085 Requirements for the sale of restricted product.
- WAC 246-889-090 Acceptable forms of photo identification.
- WAC 246-889-095 Record of sales—Electronic methamphetamine precursor tracking.
- WAC 246-889-110 Maintenance of and access to retail sales records of restricted products.
- WAC 246-889-115 Exemptions from electronic reporting.
- WAC 246-889-120 Denial of sale—Override.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

- WAC 246-891-010 Definitions.
- WAC 246-891-020 Conditions for the sale of condoms.
- WAC 246-891-030 Condom standards.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

- WAC 246-895-010 Definitions.
- WAC 246-895-020 Finished pharmaceuticals—Manufacturing practice.
- WAC 246-895-030 Personnel.
- WAC 246-895-040 Buildings or facilities.
- WAC 246-895-050 Equipment.
- WAC 246-895-060 Production and control procedures.
- WAC 246-895-070 Components.
- WAC 246-895-080 Component and drug product containers and closures.
- WAC 246-895-090 Reuse of teat dip containers and closures.
- WAC 246-895-100 Laboratory controls.
- WAC 246-895-110 Stability.
- WAC 246-895-120 Expiration dating.
- WAC 246-895-130 Packaging and labeling.
- WAC 246-895-140 Master production and control records—Batch production and control records.
- WAC 246-895-150 Distribution records.
- WAC 246-895-160 Complaint files.
- WAC 246-895-170 Variance and procedure.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

WAC 246-897-020 Availability.
WAC 246-897-060 Identity.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

WAC 246-899-020 Dispensing responsibilities.
WAC 246-899-030 Product selection responsibilities.
WAC 246-899-040 Manufacturers, wholesalers, distributors, pharmacy location, requirement that drug products offered for sale comply with 21 U.S.C. 355—Immediate suspension and subsequent revocation of licenses authorized for violation.
WAC 246-899-050 Out-of-state prescriptions.

REPEALER

The following sections of the Washington Administrative Code are repealed:

WAC 246-901-010 Definitions.
WAC 246-901-020 Pharmacy ancillary personnel utilization.
WAC 246-901-030 Technician education and training.
WAC 246-901-035 Pharmacy technician specialized functions.
WAC 246-901-040 Limitations, trainees.
WAC 246-901-050 Technician program approval.
WAC 246-901-060 Technician certification.
WAC 246-901-065 Expired technician license.
WAC 246-901-070 Pharmacy assistant utilization.
WAC 246-901-080 Pharmacy assistant registration.
WAC 246-901-090 Identification.
WAC 246-901-100 Board approval of pharmacies utilizing pharmacy ancillary personnel and specialized functions.
WAC 246-901-120 AIDS prevention and information education requirements.
WAC 246-901-130 Pharmacist to pharmacy technician ratio.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

WAC 246-903-001 Purpose and scope.
WAC 246-903-010 Definitions.
WAC 246-903-020 Nuclear pharmacies.

WAC 246-903-030 Nuclear pharmacists.
WAC 246-903-040 Minimum equipment requirements.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

WAC 246-904-010 Definition.
WAC 246-904-020 New health care entity licensing.
WAC 246-904-030 Pharmacist in charge.
WAC 246-904-040 Drug procurement, distribution and control.
WAC 246-904-050 Dispensing of prescription medications from health care entities.
WAC 246-904-060 Labeling.
WAC 246-904-070 Records.
WAC 246-904-080 Absence of a pharmacist.
WAC 246-904-090 Administration.
WAC 246-904-100 Closing.

REPEALER

The following chapter of the Washington Administrative Code is repealed:

WAC 246-905-020 Home dialysis program—Legend drugs.
WAC 246-905-030 Pharmacist consultant.
WAC 246-905-040 Records.
WAC 246-905-050 Quality assurance.

WSR 20-16-068
EXPEDITED RULES
BUILDING CODE COUNCIL

[Filed July 29, 2020, 8:48 a.m.]

Title of Rule and Other Identifying Information: Chapter 51-51 WAC, amendments to the 2018 International Residential Code.

Purpose of the Proposal and Its Anticipated Effects, Including Any Changes in Existing Rules: Reconciling state amendments with section renumbering in the 2018 International Residential Code.

Reasons Supporting Proposal: With the exception of the following issues, this represents section and reference numbering housekeeping.

	WAC	Section	Changes	Discussion
1	51-51-0202	R202	Definitions: SLEEPING LOFT: Added the missing word "on" after "main floor" for clarity.	Editorial correction.
2			Definitions: MEZZANINE: Eliminated amendment.	Deleted because amendment matched model code language.
3			Definitions: BALANCED VENTILATION: Eliminated amendment	This definition is not defined, therefore, not adopted is inappropriate.
4			Definitions: DISTRIBUTED VENTILATION SYSTEM: Eliminated amendment.	This definition is not defined, therefore, not adopted is inappropriate.
5	51-51-0314	R314.3.1	R314.3.1 Installation near cooking appliances: Eliminated amendment.	Deleted because amendment matched model code language.
6	51-51-0315	R315.1	General: Eliminated amendment.	Deleted because amendment matched model code language.
7		R315.1.1	Listings: Eliminated amendment.	Deleted because amendment matched model code language.
8		R315.4	Combination alarms: Eliminated amendment.	Deleted because amendment matched model code language.
9	51-51-03240	R324.5.1	Photovoltaic shingles: Eliminated amendment.	Deleted because amendment matched model code language.
10		R324.7.1	Fire separation distances: Corrected incorrect section number.	Corrects which section is not being adopted.
11	51-51-0404	R404.1.3.3.6	Form materials and form ties: Clarification language added.	Addresses clarification language.
12	51-51-0602	R602.1.1	Sawn lumber: Eliminated amendment.	Deleted because amendment matched model code language.
13	51-51-0703	R703.1	General: Eliminated amendment.	Deleted because amendment matched model code language.
14	51-51-1004	R1004.1.1	Emission Standards for Factory-built Fireplaces: Corrected standard title.	Corrects standard title.
15	51-51-440	Standards	ANCE: NMX-J-521/2-40-ANCE—2019/CAN/CSA-22.2 No. 60335-2-40—19/UL 60335-2-40-2019 Household and Similar Electrical Appliances - Safety-Part 2-40: Corrected standard title.	Addresses incorrect standard title.
16		Standards	ASTM E2558-2013: Standard Test Method for Determining Particulate Matter Emissions from Fires in Wood-burning Fireplaces R1004.1.1: Furnishes standard referenced in the body of the code.	Addresses referenced standard.
17		Standards	ASHRAE: 34—2019: Designation and Safety Classification of Refrigerants: Provided missing citation.	Addressed missing citation.
18	51-51-60104	AQ103	Ceiling height: Removes an incorrect deletion.	Addresses text erroneously deleting a section.
19		AQ104	Lofts: Removes an incorrect deletion.	Addresses text erroneously deleting a section.

	WAC	Section	Changes	Discussion
20	51-51-60105	Appendix U	Appendix U—Dwelling unit fire sprinkler systems: Relocated text from P2904 regarding fire sprinkler locations.	Addressed where best to place amendments to P2904.

Statutory Authority for Adoption: RCW 19.27.031, 19.27.074.

Statute Being Implemented: RCW 19.27.031, 19.27.074

Rule is not necessitated by federal law, federal or state court decision.

Name of Proponent: State building code council, governmental.

Name of Agency Personnel Responsible for Drafting and Implementation: Richard Brown, 1500 Jefferson Street S.E., Olympia, WA 98504, 360-407-9277; Enforcement: Local jurisdictions having authority.

This notice meets the following criteria to use the expedited adoption process for these rules:

Corrects typographical errors, make address or name changes, or clarify language of a rule without changing its effect.

Explanation of the Reason the Agency Believes the Expedited Rule-Making Process is Appropriate: This addresses clerical oversight.

NOTICE

THIS RULE IS BEING PROPOSED UNDER AN EXPEDITED RULE-MAKING PROCESS THAT WILL ELIMINATE THE NEED FOR THE AGENCY TO HOLD PUBLIC HEARINGS, PREPARE A SMALL BUSINESS ECONOMIC IMPACT STATEMENT, OR PROVIDE RESPONSES TO THE CRITERIA FOR A SIGNIFICANT LEGISLATIVE RULE. IF YOU OBJECT TO THIS USE OF THE EXPEDITED RULE-MAKING PROCESS, YOU MUST EXPRESS YOUR OBJECTIONS IN WRITING AND THEY MUST BE SENT TO Richard Brown, State Building Code Council, 1500 Jefferson Street S.E., Olympia, WA 98504, phone 360-407-9277, email richard.brown@des.wa.gov, AND RECEIVED BY October 5, 2020.

July 29, 2020
Diane Glenn
Chair

AMENDATORY SECTION (Amending WSR 16-03-025, filed 1/11/16, effective 7/1/16)

WAC 51-51-0102 Section R102—Applicability.

R102.5 Appendices. Provisions in the appendices shall not apply unless specifically referenced in the adopting ordinance. An appendix adopted by a local jurisdiction shall not be effective unless approved by the state building code council pursuant to RCW 19.27.060 (1)(a).

EXCEPTIONS: 1. The state building code council has determined that a local ordinance providing specifications for light straw-clay or strawbale construction, or requiring a solar-ready zone or requiring fire sprinklers in accordance with Appendix R, S, U or V of this chapter may be adopted by any local government upon notification of the council.

2. Appendix F, Radon Control Methods, and Appendix Q, Dwelling Unit Fire Sprinkler Systems, are included in adoption of the International Residential Code.

R102.7.1 Additions, alterations or repairs. Additions, alterations or repairs to any structure shall conform to the requirements for a new structure without requiring the existing structure to comply with the requirements of this code, unless otherwise stated. Additions, alterations or repairs and relocations shall not cause an existing structure to become unsafe or adversely affect the performance of the building.

EXCEPTIONS: 1. Additions with less than 500 square feet of conditioned floor area are exempt from the requirements for Whole House Ventilation Systems, Section ((M1508)) M1505.4.
2. Additions or alterations to existing buildings which do not require the construction of foundations, crawlspaces, slabs or basements shall not be required to meet the requirements for radon protection in Section ((R327.1)) R332.1 and Appendix F.

R102.7.2 Moved buildings. Buildings or structures moved into or within a jurisdiction shall comply with the provisions of this code, the *International Building Code* (chapter 51-50 WAC), the *International Mechanical Code* (chapter 51-52 WAC), the *International Fire Code* (chapter 51-54A WAC), the *Uniform Plumbing Code and Standards* (chapter 51-56 WAC), and the *Washington State Energy Code* (chapter 51-11R WAC) for new buildings or structures.

EXCEPTION: Group R-3 buildings or structures are not required to comply if:
1. The original occupancy classification is not changed; and
2. The original building is not substantially remodeled or rehabilitated. For the purposes of this section a building shall be considered to be substantially remodeled when the costs of remodeling exceed 60 percent of the value of the building exclusive of the costs relating to preparation, construction, demolition or renovation of foundations.

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

WAC 51-51-0202 Section R202—Definitions.

ADULT FAMILY HOME means a dwelling in which a person or persons provide personal care, special care, room and board to more than one but not more than six adults who are not related by blood or marriage to the person or persons providing the services.

~~((**BALANCED VENTILATION.** This definition is not adopted.))~~

BALANCED WHOLE HOUSE VENTILATION. Balanced whole house ventilation is defined as any combination of concurrently operating residential unit mechanical exhaust and mechanical supply whereby the total mechanical exhaust airflow rate is within 10 percent or 5 cfm, whichever is greater,

of the total mechanical supply airflow rate. Intermittent dryer exhaust, intermittent range hood exhaust, and intermittent toilet room exhaust airflow rates above the residential dwelling or sleeping unit minimum ventilation rate are exempt from the balanced airflow calculation.

BATTERY SYSTEM, STATIONARY STORAGE. This definition is not adopted.

BUILDING, EXISTING. A building or structure erected prior to the adoption of this code, or one that has passed a final inspection.

BUILDING. Any one- or two-family dwelling or *townhouse*, or portion thereof used or intended to be used for human habitation, for living, sleeping, cooking or eating purposes, or any combination thereof, or any accessory structure.

CHILD CARE, FAMILY HOME. A child care facility, licensed by Washington state, located in the dwelling of the person or persons under whose direct care and supervision the child is placed, for the care of twelve or fewer children, including children who reside at the home.

CHILD DAY CARE, shall, for the purposes of these regulations, mean the care of children during any period of a 24 hour day.

CONDITIONED SPACE. An area, room or space that is enclosed within the building thermal envelope and that is directly or indirectly heated or cooled. Spaces are indirectly heated or cooled where they communicate through openings with conditioned spaces, where they are separated from conditioned spaces by uninsulated walls, floors or ceilings, or where they contain uninsulated ducts, piping or other sources of heating or cooling.

~~((**DISTRIBUTED VENTILATION SYSTEM.** This definition is not adopted.))~~

DISTRIBUTED WHOLE HOUSE VENTILATION. A whole house ventilation system shall be considered distributed when it supplies outdoor air directly (not transfer air) to each dwelling or sleeping unit habitable space (living room, den, office, interior adjoining spaces or bedroom), and exhausts air from all kitchens and bathrooms directly outside.

DWELLING UNIT. A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation. Dwelling units may also include the following uses:

1. Adult family homes, foster family care homes and family day care homes licensed by the Washington state department of social and health services.

2. Offices, mercantile, food preparation for off-site consumption, personal care salons or similar uses which are conducted primarily by the occupants of the dwelling unit and are secondary to the use of the unit for dwelling purposes, and which do not exceed 500 square feet (46.4 m²).

EGRESS ROOF ACCESS WINDOW. A skylight or roof window designed and installed to satisfy the *Emergency Escape and Rescue Opening* requirements of Section R310.2.

ENERGY STORAGE SYSTEMS (ESS). One or more devices, assembled together, capable of storing energy in order to supply electrical energy at a future time.

FIRE SEPARATION DISTANCE. The distance measured from the foundation wall or face of the wall framing, whichever is closer, to one of the following:

1. To the closest interior lot line; or
2. To the centerline of a street, an alley or public way; or
3. To an imaginary line between two buildings on the lot.

The distance shall be measured at a right angle from the wall.

FLOOR AREA. The area within the inside perimeter of exterior walls of the building. The floor area of a building, or portion thereof, not provided with surrounding exterior walls shall be the usable area under the horizontal projection of the roof or floor above.

LANDING PLATFORM. A landing provided as the top step of a stairway accessing a *Sleeping Loft*.

LOCAL EXHAUST. An exhaust system that uses one or more fans to exhaust air from a specific room or rooms within a residential dwelling or sleeping unit.

LOT. A measured portion or parcel of land considered as a unit having fixed boundaries.

LOT LINE. The line which bounds a plot of ground described as a *lot* in the title to the property.

~~((**MEZZANINE.** An intermediate level or levels between the floor and ceiling of any story.))~~

MIXED VENTILATION ZONE. This definition is not adopted.

SALT WATER COASTAL AREA. Those areas designated as salt water coastal areas by the local jurisdiction.

SLEEPING LOFT. A sleeping space on a floor level located more than 30 inches (726 mm) above the main floor and open to the main floor on one or more sides with a ceiling height of less than 6 feet 8 inches (2032 mm).

SMALL BUSINESS. Any business entity (including a sole proprietorship, corporation, partnership or other legal entity) which is owned and operated independently from all other businesses, which has the purpose of making a profit, and which has fifty or fewer employees.

TOWNHOUSE. A building that contains three or more attached *townhouse units*.

TOWNHOUSE UNIT. A single-family *dwelling unit* in a *townhouse* that extends from foundation to roof and that has a yard or public way on not less than two sides that extends at least 50 percent of the length of each of these two sides.

WHOLE HOUSE VENTILATION SYSTEM. A mechanical ventilation system, including fans, controls, and ducts, which replaces, by direct means, air from the habitable rooms with outdoor air.

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

WAC 51-51-03100 Section ((3100)) 310—Emergency escape and rescue openings.

((R3100.1)) R310.1 Emergency escape and rescue opening required. Basements, habitable attics and every sleeping room shall have not less than one operable emergency escape and rescue opening. Where basements contain one or more sleeping rooms, an emergency escape and rescue opening shall be required in each sleeping room. Emergency escape and rescue openings shall open directly into a public way, or to a yard or court providing an unobstructed path with a width of not less than 36 inches (914 mm) that opens to a public way.

- EXCEPTIONS:
1. Storm shelters and basements used only to house mechanical equipment not exceeding a total floor area of 200 square feet (18.58 m).
 2. Where the *dwelling unit* or *townhouse unit* is equipped with an automatic sprinkler system installed in accordance with Section P2904, sleeping rooms in basements shall not be required to have emergency escape and rescue openings provided that the basement has one of the following:
 - 2.1. One means of egress complying with Section R311 and one emergency escape and rescue opening.
 - 2.2. Two means of egress complying with Section R311.

((R3100.1.1)) R310.1.1 Operational constraints and opening control devices. Emergency escape and rescue openings shall be operational from the inside of the room without the use of keys, tools, or special knowledge. Window opening control devices on windows serving as a required emergency escape and rescue opening shall be not more than 70 inches (177.8 cm) above the finished floor and shall comply with ASTM F2090.

((R3100.2.4)) R310.2.4 Emergency escape and rescue openings under decks and porches. Emergency escape and rescue openings installed under decks and porches shall be fully openable and provided with an unobstructed pathway of not less than 36 inches (914 mm) in height, 36 inches (914 mm) in width, and no greater than 60 inches (1524 mm) in length that opens to a yard or court. The pathway shall be measured from the exterior face of the glazed opening, or if the glazed opening is in a window well, at the window well wall furthest from the exterior face of the glazed opening.

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

WAC 51-51-0314 Section R314—Smoke alarms and heat detection.

R314.1 General. Smoke alarms, heat detectors, and heat alarms shall comply with NFPA 72 and this section.

R314.1.1 Listings. Smoke alarms shall be listed in accordance with UL 217. Heat detectors and heat alarms shall be listed for the intended application. Combination smoke and carbon monoxide alarms shall be listed in accordance with UL 217 and UL 2034.

R314.2 Where required. Smoke alarms, heat detectors, and heat alarms shall be provided in accordance with this section.

R314.2.1 New construction. Smoke alarms shall be provided in *dwelling units*. A heat detector or heat alarm shall be provided in new attached garages.

R314.2.2 Alterations, repairs and additions. Where *alterations, repairs* or *additions* requiring a permit occur, or where one or more sleeping rooms are added or created in existing dwellings, or where an accessory dwelling unit is created within an existing *dwelling unit*, each *dwelling unit* shall be equipped with smoke alarms as required for new dwellings.

- EXCEPTIONS:
1. Work involving the exterior surfaces of *dwellings*, such as the replacement of roofing or siding, the *addition* or replacement of windows or doors, or the addition of a porch or deck are exempt from the requirements of this section.
 2. Installation, *alteration* or repairs of plumbing, electrical or mechanical systems are exempt from the requirements of this section.

R314.2.3 New attached garages. A heat detector or heat alarm rated for the ambient outdoor temperatures and humidity shall be installed in new garages that are attached to or located under new and existing dwellings. Heat detectors and heat alarms shall be installed in a central location and in accordance with the manufacturer's instructions.

- EXCEPTION:
- Heat detectors and heat alarms shall not be required in dwellings without commercial power.

R314.3 Location. Smoke alarms shall be installed in the following locations:

1. In each sleeping room or sleeping loft.
2. Outside each separate sleeping area in the immediate vicinity of the bedrooms.
3. On each additional story of the dwelling, including basements and habitable attics but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.
4. Smoke alarms shall be installed not less than 3 feet (914 mm) horizontally from the door or opening of a bathroom that contains a bathtub or shower unless this would prevent placement of a smoke alarm required by Section R314.3.
5. In napping areas in a family home child care.

((R314.3.1 Installation near cooking appliances. Smoke alarms shall not be installed in the following locations unless this would prevent placement of a smoke alarm in a location required by Section R314.3.

1. Ionization smoke alarms shall not be installed less than 20 feet (6096 mm) horizontally from a permanently installed cooking *appliance*.
2. Ionization smoke alarms with an alarm silencing switch shall not be installed less than 10 feet (3048 mm) horizontally from a permanently installed cooking *appliance*.
3. Photoelectric smoke alarms shall not be installed less than 6 feet (1828 mm) horizontally from a permanently installed cooking *appliance*.)

R314.4 Interconnection. Where more than one smoke alarm is required to be installed within an individual *dwelling unit* in accordance with Section R314.2, the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual *dwelling unit*. Where an accessory *dwelling unit* is created within an existing *dwelling unit* all required smoke alarms, in the accessory *dwelling unit* and the primary *dwelling unit*, shall be interconnected in such a manner that the actuation of one alarm will activate all alarms in both the primary *dwelling unit* and the accessory *dwelling unit*. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm.

EXCEPTION: Smoke alarms and alarms installed to satisfy Section R314.4.1 shall not be required to be interconnected to existing smoke alarms where such existing smoke alarms are not interconnected or where such new smoke alarm or alarm is not capable of being interconnected to the existing smoke alarms.

R314.4.1 Heat detection interconnection. Heat detectors and heat alarms shall be connected to an alarm or a smoke alarm that is installed in the *dwelling*. Alarms and smoke alarms that are installed for this purpose shall be located in a hallway, room, or other location that will provide occupant notification.

R314.6 Power source. Smoke alarms, heat alarms, and heat detectors shall receive their primary power from the building wiring where such wiring is served from a commercial source and, where primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection.

EXCEPTIONS: 1. Smoke alarms shall be permitted to be battery operated where installed in buildings without commercial power.
2. Smoke alarms installed in accordance with Section R314.2.2 shall be permitted to be battery powered.

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

WAC 51-51-0315 Section R315—Carbon monoxide alarms.

~~((R315.1 General. Carbon monoxide alarms shall comply with Section R315.~~

~~**R315.1.1 Listings.** Carbon monoxide alarms shall be listed in accordance with UL 2034. Combination carbon monoxide and smoke alarms shall be listed in accordance with UL 2034 and UL 217.))~~

R315.2 Where required. Carbon monoxide alarms shall be provided in accordance with Sections R315.2.1 and R315.2.2.

R315.2.1 New construction. For new construction, an approved carbon monoxide alarm shall be installed outside of each separate sleeping area in the immediate vicinity of the

bedrooms in dwelling units and on each level of the dwelling in accordance with the manufacturer's recommendation.

R315.2.2 Alterations, repairs, and additions. Existing dwellings shall be equipped with carbon monoxide alarms in accordance with Section R315.2.1. An inspection will occur where alterations, repairs, or additions requiring a permit occur, or where one or more sleeping rooms are added or created.

EXCEPTIONS: 1. Work involving only the exterior surfaces of dwellings, such as the replacement of roofing or siding, or the addition or replacement of windows or doors, or the addition of a porch or deck, is exempt from the inspection requirements of this section.
2. Installation, alteration or repairs of nonfuel burning plumbing or mechanical systems or electrical systems are exempt from the inspection requirements of this section.
3. Owner-occupied single-family residences legally occupied before July 26, 2009. RCW 19.27.530 (2)(b).

R315.3 Location. Carbon monoxide alarms in dwelling units shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms and on each level of the dwelling and in accordance with the manufacturer's recommendations. Where a fuel burning appliance is located within a bedroom or its attached bathroom, a carbon monoxide alarm shall be installed within the bedroom.

~~((R315.4 Combination alarms. Combination carbon monoxide and smoke alarms shall be permitted to be used in lieu of carbon monoxide alarms.))~~

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

WAC 51-51-03240 Section R324—Solar energy systems.

R324.3 Photovoltaic systems. Installation, modification, or alteration of solar photovoltaic power systems shall comply with this section and the *International Fire Code*. Section R104.11 alternate materials and methods of this code shall be considered when approving the installation of solar photovoltaic power systems. Photovoltaic systems shall be designed and installed in accordance with Sections R324.3.1 through R324.6 and chapter 19.28 RCW. Inverters shall be listed and labeled in accordance with UL 1741. Systems connected to the utility grid shall use inverters listed for utility interaction.

EXCEPTION: Detached, nonhabitable Group U structures shall not be subject to the requirements of this section for structural and fire safety.

R324.4 Rooftop-mounted photovoltaic systems. Rooftop-mounted photovoltaic panel systems installed on or above the roof covering shall be designed and installed in accordance with Section R907.

EXCEPTION((S)): The roof structure shall be deemed adequate to support the load of the rooftop solar photovoltaic system if all of the following requirements are met:

1. The solar photovoltaic panel system shall be designed for the wind speed of the local area, and shall be installed per the manufacturer's specifications.

2. The ground snow load does not exceed 70 pounds per square foot.
3. The total dead load of modules, supports, mountings, raceways, and all other appurtenances weigh no more than 4 pounds per square foot.
4. Photovoltaic modules are not mounted higher than 18 inches above the surface of the roofing to which they are affixed.
5. Supports for solar modules are to be installed to spread the dead load across as many roof-framing members as needed, so that no point load exceeds 50 pounds.

~~((R324.5.1 Photovoltaic shingles. Photovoltaic shingles shall comply with Section R905.16.~~

~~R324.6)) R324.7.1~~ This section is not adopted.

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

WAC 51-51-0325 Section R325—((Reserved)) Mezzanines.

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

WAC 51-51-0507 Section R507—Decks.

R507.1 Decks. Wood-framed decks shall be in accordance with this section. Decks shall be designed for the live load required in Section R301.5 or the ground snow load indicated in Table R301.2(1), whichever is greater. For decks using materials and conditions not prescribed in this section, refer to Section R301.

TABLE R507.3.1

MINIMUM FOOTING SIZE FOR DECKS

LIVE OR GROUND SNOW LOAD ^b (psf)	TRIBUTARY AREA ^c (sq.ft.)	SOIL BEARING CAPACITY ^{acd}								
		1500 psf			2000 psf			≥ 3000 psf		
		Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness ^f (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness ^f (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness ^f (inches)
60 Live or 70 Ground Snow Load	5	7	8	6	7	8	6	7	8	6
	20	12	14	6	11	13	6	9	10	6
	40	18	20	6	15	17	6	12	14	6
	60	21	24	8	19	21	6	15	17	6
	80	25	28	9	21	24	8	18	20	6
	100	28	31	11	24	27	9	20	22	7
	120	30	34	12	26	30	10	21	24	8
	140	33	37	13	28	32	11	23	26	9
	160	35	40	15	30	34	12	25	28	9

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m², 1 pound per square foot = 0.0479 kPa.

- a. Interpolation permitted, extrapolation not permitted.
- b. Reserved.
- c. Footing dimensions shall allow complete bearing of the post.
- d. If the support is a brick or CMU pier, the footing shall have a minimum 2-inch projection on all sides.
- e. Area, in square feet, of deck surface supported by post and footings.
- f. Minimum thickness shall only apply to plain concrete footings.

R507.4 Deck posts. For single-level decks, wood post size shall be in accordance with Table R507.4.

R325.1 General. Mezzanines shall comply with Sections R325 through R325.5. *Habitable attics* shall comply with Section R326.

AMENDATORY SECTION (Amending WSR 16-03-025, filed 1/11/16, effective 7/1/16)

WAC 51-51-0404 ((Reserved)) Section R404—Foundation and retaining walls.

R404.1.3.3.6 Form materials and form ties. Forms shall be made of wood, steel, aluminum, plastic, a composite of cement and foam insulation, a composite of cement and wood chips, or other approved material suitable for supporting and containing concrete. Forms shall be positioned and secured before placing concrete and shall provide sufficient strength to contain concrete during the concrete placement operation.

Form ties shall be steel, solid plastic, foam plastic, a composite of cement and wood chips, a composite of cement and foam plastic, or other suitable material capable of resisting the forces created by fluid pressure of fresh concrete.

**TABLE R507.4
DECK POST HEIGHT**

LOADS ^b (psf)	POST SPECIES ^c	POST SIZE ^d	MAXIMUM DECK POST HEIGHT ^a (feet-inches)							
			Tributary Area ^{g,h} (sq. ft.)							
			20	40	60	80	100	120	140	160
60 Live Load, ≤60 Ground Snow Load	Douglas Fir ^e , Hem-fir ^e , SPF ^e	4 x 4	14-0	10-10	8-7	7-0	5-8	4-1	NP	NP
		4 x 6	14-0	13-10	11-1	9-5	8-2	7-3	6-4	5-4
		6 x 6	14-0	14-0	14-0	14-0	14-0	13-3	10-9	6-11
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
	Redwood ^f , Western Cedars ^f , Ponderosa Pine ^f , Red Pine ^f	4 x 4	14-0	10-3	7-0	NP	NP	NP	NP	NP
		4 x 6	14-0	13-6	10-6	8-4	5-10	NP	NP	NP
		6 x 6	14-0	14-0	14-0	14-0	11-11	NP	NP	NP
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
70 Ground Snow Load	Douglas Fir ^e , Hem-fir ^e , SPF ^e	4 x 4	14-0	10-1	7-11	6-6	5-3	3-7	NP	NP
		4 x 6	14-0	12-10	10-3	8-9	7-7	6-8	5-10	4-11
		6 x 6	14-0	14-0	14-0	14-0	14-0	12-2	9-9	5-9
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
	Redwood ^f , Western Cedars ^f , Ponderosa Pine ^f , Red Pine ^f	4 x 4	14-0	9-5	6-5	NP	NP	NP	NP	NP
		4 x 6	14-0	12-6	9-8	7-7	5-3	NP	NP	NP
		6 x 6	14-0	14-0	14-0	14-0	10-8	NP	NP	NP
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m², 1 pound per square foot = 0.0479 kPa, NP = Not permitted.

- a. Measured from the underside of the beam to top of footing or pier.
- b. 10 psf dead load. Snow load not assumed to be concurrent with live load.
- c. No. 2 grade, wet service factor included.
- d. Notched deck posts shall be sized to accommodate beam size per in accordance with Section R507.5.2.
- e. Includes incising factor.
- f. Incising factor not included.
- g. Area, in square feet, of deck surface supported by post and footing.
- h. Interpolation permitted. Extrapolation not permitted.

R507.5 Deck beams. Maximum allowable spans for wood deck beams, as shown in Figure R507.5, shall be in accordance with Tables R507.5(1) through R507(4). Beam plies shall be fastened with two rows of 10d (3-inch × 0.128-inch) nails minimum at 16 inches (406 mm) on center along each edge. Beams shall be permitted to cantilever at each end up to one-fourth of the allowable beam span. Deck beams of other materials shall be permitted where designed in accordance with accepted engineering practices.

**TABLE R507.5
MAXIMUM DECK BEAM SPAN - 60 PSF LIVE LOAD or
70 PSF GROUND SNOW LOAD^c**

BEAM SPECIES ^d	BEAM SIZE ^e	MAXIMUM BEAM SPAN ^{a,b,f} (feet-inches)						
		Deck Joist Span ^{a,i} (feet)						
		6	8	10	12	14	16	18
Douglas fir-larch ^g , Hem-fir ^g , Spruce-pine-fir ^g	1-2×6	3-5	2-10	2-5	2-2	2-0	1-10	1-9
	1-2×8	4-7	3-8	3-2	2-10	2-7	2-5	2-4
	1-2×10	5-8	4-9	4-1	3-8	3-4	3-1	2-11
	1-2×12	6-7	5-8	5-0	4-6	4-1	3-10	3-7
	2-2×6	5-2	4-6	4-0	3-5	3-1	2-10	2-7
	2-2×8	6-11	6-0	5-3	4-7	4-1	3-8	3-5
	2-2×10	8-5	7-4	6-6	5-10	5-2	4-9	4-5
	2-2×12	9-10	8-6	7-7	6-11	6-4	5-9	5-4
	3-2×6	6-6	5-7	5-0	4-7	4-2	3-9	3-5
	3-2×8	8-8	7-6	6-8	6-1	5-6	5-0	4-7
	3-2×10	10-7	9-2	8-2	7-6	6-11	6-4	5-10
3-2×12	12-4	10-8	9-7	8-9	8-1	7-7	7-1	
Redwood ^h , Western Cedars ^h , Ponderosa Pine ^h , Red Pine ^h	1-2×6	3-6	2-11	2-6	2-3	2-0	1-11	1-9
	1-2×8	4-6	3-10	3-3	2-11	2-8	2-6	2-4
	1-2×10	5-6	4-9	4-2	3-9	3-5	3-2	3-0
	1-2×12	6-4	5-6	4-11	4-6	4-2	3-11	3-8
	2-2×6	5-3	4-7	4-1	3-6	3-2	2-11	2-8
	2-2×8	6-8	5-9	5-2	4-8	4-2	3-10	3-6
	2-2×10	8-2	7-1	6-4	5-9	5-4	4-10	4-6
	2-2×12	9-5	8-2	7-4	6-8	6-2	5-9	5-5
	3-2×6	6-4	5-8	5-1	4-8	4-3	3-10	3-6
	3-2×8	8-4	7-3	6-5	5-11	5-5	5-1	4-8
	3-2×10	10-2	8-10	7-11	7-2	6-8	6-3	5-11
3-2×12	11-10	10-3	9-2	8-4	7-9	7-3	6-10	

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

- a. Interpolation allowed. Extrapolation is not allowed.
- b. Beams supporting a single span of joists with or without cantilever.
- c. Dead load = 10 psf, L/Δ = 360 at mainspan, L/Δ = 180 at cantilever. Snow load not assumed to be concurrent with live load.
- d. No. 2 grade, wet service factor included.
- e. Beam depth shall be equal to or greater than the depth of intersecting joist for a flush beam connection.
- f. Beam cantilevers are limited to the adjacent beam's span divided by 4.
- g. Includes incising factor.
- h. Incising factor not included.
- i. Deck joist span as shown in Figure R507.5.

TABLE R507.5(1)
MAXIMUM DECK BEAM SPAN - 40 PSF LIVE LOAD (NOT ADOPTED)

TABLE R507.5(2)
MAXIMUM DECK BEAM SPAN - 50 PSF LIVE LOAD (NOT ADOPTED)

TABLE R507.5(3)
MAXIMUM DECK BEAM SPAN - 60 PSF LIVE LOAD^c

BEAM SPECIES ^d	BEAM SIZE ^e	DECK JOIST SPAN ^{a,i} (feet)						
		6	8	10	12	14	16	18
		MAXIMUM BEAM SPAN ^{a,b,f} (feet-inches)						
Douglas fir-larch ^g , Spruce-pine-fir ^g	1-2×6	3-8	3-1	2-8	2-4	2-2	2-0	1-10
	1-2×8	5-0	4-1	3-6	3-1	2-10	2-7	2-5
	1-2×10	6-1	5-2	4-6	4-0	3-7	3-4	3-2
	1-2×12	7-1	6-1	5-5	4-10	4-5	4-1	3-10
	2-2×6	5-6	4-9	4-3	3-10	3-5	3-1	2-10
	2-2×8	7-5	6-5	5-9	5-0	4-6	4-1	3-9
	2-2×10	9-0	7-10	7-0	6-4	5-9	5-2	4-10
	2-2×12	10-6	9-1	8-1	7-5	6-10	6-4	5-10
	3-2×6	6-11	6-0	5-4	4-11	4-6	4-2	3-10
	3-2×8	9-3	8-0	7-2	6-6	6-1	5-6	5-0
	3-2×10	11-4	9-10	8-9	8-0	7-5	6-11	6-5
3-2×12	13-2	11-5	10-2	9-4	8-7	8-1	7-7	
Redwood ^h , Western Cedars ^h , Ponderosa Pine ^h , Red Pine ^h	1-2×6	6-9	3-2	2-9	2-5	2-2	2-0	1-11
	1-2×8	4-10	4-2	3-7	3-2	2-11	2-8	2-6
	1-2×10	5-10	5-1	4-6	4-1	3-8	3-5	3-3
	1-2×12	6-10	5-11	5-3	4-10	4-5	4-2	3-11
	2-2×6	5-7	4-10	4-4	3-11	3-6	3-2	2-11
	2-2×8	7-1	6-2	5-6	5-0	4-7	4-2	3-10
	2-2×10	8-8	7-6	6-9	6-2	5-8	5-4	4-11
	2-2×12	10-1	8-9	7-10	7-2	6-7	6-2	5-10
	3-2×6	6-8	6-1	5-5	5-0	4-7	4-3	3-11
	3-2×8	8-9	7-9	6-11	6-4	5-10	5-5	5-2
	3-2×10	10-11	9-5	8-5	7-8	7-2	6-8	6-3
3-2×12	12-8	10-11	9-9	8-11	8-3	7-9	7-3	

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

- a. Interpolation permitted. Extrapolation not permitted.
- b. Beams supporting a single span of joists with or without cantilever.
- c. Dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever. Snow load not assumed to be concurrent with live load.
- d. No. 2 grade, wet service factor included.
- e. Beam depth shall be equal to or greater than the depth intersecting joist for a flush beam connection.
- f. Beam cantilevers are limited to the adjacent beam's span divided by 4.
- g. Includes incising factor.
- h. Incising factor not included.
- i. Deck joist span as shown in Figure R507.5.

TABLE R507.5(4)
MAXIMUM DECK BEAM SPAN - 70 PSF LIVE LOAD^c

BEAM SPECIES ^d	BEAM SIZE ^e	DECK JOIST SPAN ^{a,i} (feet)						
		6	8	10	12	14	16	18
		MAXIMUM BEAM SPAN ^{a,b,f} (feet-inches)						
Douglas fir-larch ^g , Spruce-pine-fir ^g	1-2×6	3-5	2-10	2-5	2-2	2-0	1-10	1-9
	1-2×8	4-7	3-8	3-2	2-10	2-7	2-5	2-4
	1-2×10	5-8	4-9	4-1	3-8	3-4	3-1	2-11
	1-2×12	6-7	5-8	5-0	4-6	4-1	3-10	3-7
	2-2×6	5-2	4-6	4-0	3-5	3-1	2-10	2-7
	2-2×8	6-11	6-0	5-3	4-7	4-1	3-8	3-5
	2-2×10	8-5	7-4	6-6	5-10	5-2	4-9	4-5
	2-2×12	9-10	8-6	7-7	6-11	6-4	5-9	5-4
	3-2×6	6-6	5-7	5-0	4-7	4-2	3-9	3-5
	3-2×8	8-8	7-6	6-8	6-1	5-6	5-0	4-7
	3-2×10	10-7	9-2	8-2	7-6	6-11	6-4	5-10
3-2×12	12-4	10-8	9-7	8-9	8-1	7-7	7-1	
Redwood ^h , Western Cedars ^h , Ponderosa Pine ^h , Red Pine ^h	1-2×6	3-6	2-11	2-6	2-3	2-0	1-11	1-9
	1-2×8	4-6	3-10	3-3	2-11	2-8	2-6	2-4
	1-2×10	5-6	4-9	4-2	3-9	3-5	3-2	3-0
	1-2×12	6-4	5-6	4-11	4-6	4-2	3-11	3-8
	2-2×6	5-3	4-7	4-1	3-6	3-2	2-11	2-8
	2-2×8	6-8	5-9	5-2	4-8	4-2	3-10	3-6
	2-2×10	8-2	7-1	6-4	5-9	5-4	4-10	4-6
	2-2×12	9-5	8-2	7-4	6-8	6-2	5-9	5-5
	3-2×6	6-4	5-8	5-1	4-8	4-3	3-10	3-6
	3-2×8	8-4	7-3	6-5	5-11	5-5	5-1	4-8
	3-2×10	10-2	8-2	7-11	7-2	6-8	6-3	5-11
3-2×12	11-10	10-3	9-2	8-4	7-9	7-3	7	

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

- a. Interpolation permitted. Extrapolation not permitted.
- b. Beams supporting a single span of joists with or without cantilever.
- c. Dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever. Snow load not assumed to be concurrent with live load.
- d. No. 2 grade, wet service factor included.
- e. Beam depth shall be equal to or greater than the depth intersecting joist for a flush beam connection.
- f. Beam cantilevers are limited to the adjacent beam's span divided by 4.
- g. Includes incising factor.
- h. Incising factor not included.
- i. Deck joist span as shown in Figure R507.5.

R507.6 Deck joists. Maximum allowable spans for wood deck joists, as shown in Figure R507.6, shall be in accordance with Table R507.6. The maximum joist spacing shall be limited by the decking materials in accordance with Table R507.7.

TABLE R507.6
MAXIMUM DECK JOIST SPANS

((LOAD* (psf)	JOIST SPECIES ^b	JOIST SIZE	ALLOWABLE JOIST SPAN ^c (feet-inches)			MAXIMUM CANTILEVER ^d (feet-inches) ADJACENT JOIST SPAN ^e							
			JOIST SPACING (inches)			JOIST BACK SPAN ^e (feet)							
			12	16	24	4	6	8	10	12	14	16	18
60 Ground-Snow-Load	Douglas Fir ^e , Hem-fir ^e , SPF ^e	2×6	8-4	7-6	6-2	1-0	1-6	1-4	NP	NP	NP	NP	NP
		2×8	10-11	9-11	8-3	1-0	1-6	2-0	2-2	NP	NP	NP	NP
		2×10	13-11	12-4	10-0	1-0	1-6	2-0	2-6	2-10	NP	NP	NP
		2×12	16-6	14-3	11-8	1-0	1-6	2-0	2-6	3-0	3-5	3-5	NP
	Redwood ^f , Western Cedars ^f , Ponderosa Pine ^f , Red Pine ^f	2×6	7-9	7-0	6-2	1-0	1-4	NP	NP	NP	NP	NP	NP
		2×8	10-2	9-3	7-11	1-0	1-6	2-0	1-11	NP	NP	NP	NP
		2×10	13-0	11-9	9-7	1-0	1-6	2-0	2-6	2-7	NP	NP	NP
		2×12	15-9	13-8	11-2	1-0	1-6	2-0	2-6	3-0	3-2	NP	NP
70 Ground-Snow-Load	Douglas Fir ^e , Hem-fir ^e , SPF ^e	2×6	7-11	7-1	5-9	1-0	1-6	NP	NP	NP	NP	NP	NP
		2×8	10-5	9-5	7-9	1-0	1-6	2-0	2-1	NP	NP	NP	NP
		2×10	13-3	11-6	9-5	1-0	1-6	2-0	2-6	2-8	NP	NP	NP
		2×12	15-5	13-4	10-11	1-0	1-6	2-0	2-6	3-0	3-3	NP	NP
	Redwood ^f , Western Cedars ^f , Ponderosa Pine ^f , Red Pine ^f	2×6	7-4	6-8	5-10	1-0	1-4	NP	NP	NP	NP	NP	NP
		2×8	9-8	8-10	7-4	1-0	1-6	1-11	NP	NP	NP	NP	NP
		2×10	12-4	11-0	9-0	1-0	1-6	2-0	2-6	2-6	NP	NP	NP
		2×12	14-9	12-9	10-5	1-0	1-6	2-0	2-6	3-0	3-0	NP	NP

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg, NP = Not permitted.

- a. Dead load = 10 psf dead load. Snow load not assumed to be concurrent with live load.
- b. No. 2 grade, wet service factor included.
- c. L/Δ = 360 at main span.
- d. L/Δ = 180 at cantilever with 220-pound point load applied to end.
- e. Includes incising factor.
- f. Incising factor not included.
- g. Interpolation permitted. Extrapolation not permitted.))

LOAD ^a (psf)	JOIST SPECIES ^b	JOIST SIZE	ALLOWABLE JOIST SPAN ^{b,c} (feet-inches)			MAXIMUM CANTILEVER ^{f,g} (feet-inches)							
			Joist Spacing (inches)			Adjacent Joist Back Span ^e (feet)							
			12	16	24	4	6	8	10	12	14	16	18
60 Live Load or 70 Ground Snow Load	Douglas fir-larch ^e , Hem-fir ^e , Spruce-pine-fir ^e	2×6	7-11	7-1	5-9	1-0	1-6	NP	NP	NP	NP	NP	NP
		2×8	10-5	9-5	7-8	1-0	1-6	2-0	2-1	NP	NP	NP	NP
		2×10	13-3	11-6	9-5	1-0	1-6	2-0	2-6	2-8	NP	NP	NP
		2×12	15-5	13-4	10-11	1-0	1-6	2-0	2-6	3-0	3-3	NP	NP
	Redwood ^f , West-ern Cedars ^f , Pon-derosa Pine ^f , Red Pine ^f	2×6	7-4	6-8	5-10	1-0	1-4	NP	NP	NP	NP	NP	NP
		2×8	9-8	8-10	7-4	1-0	1-6	1-11	NP	NP	NP	NP	NP
		2×10	12-4	11-0	9-0	1-0	1-6	2-0	2-6	2-6	NP	NP	NP
		2×12	14-9	12-9	10-5	1-0	1-6	2-0	2-6	3-0	3-0	NP	NP

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg, NP = Not permitted.

- a. Dead load = 10 psf dead load. Snow load not assumed to be concurrent with live load.
- b. No. 2 grade, wet service factor included.
- c. L/Δ = 360 at main span.
- d. L/Δ = 180 at cantilever with 220-pound point load applied to end.
- e. Includes incising factor.
- f. Incising factor not included.

g. Interpolation permitted. Extrapolation not permitted.

R507.9.1.2 Band joist details. Band joists supporting a ledger shall be a minimum 2-inch-nominal (51 mm), solid-sawn, spruce-pine-fir or better lumber or minimum 1-inch (25 mm) nominal engineered wood rim boards in accordance with Section R502.1.7. Band joists shall bear fully on the primary structure capable of supporting all required loads.

TABLE R507.9.1.3(1)
DECK LEDGER CONNECTION TO BAND JOIST

LOAD ^c (psf)	JOIST SPAN ^a (feet)	ON-CENTER SPACING OF FASTENERS ^b (inches)		
		1/2-inch diameter lag screw with 1/2-inch maximum sheathing ^{d,e}	1/2-inch diameter bolt with 1/2-inch maximum sheathing ^e	1/2-inch diameter bolt with 1-inch maximum sheathing ^f
60 Live Load or 70 Ground Snow Load	6	22	36	35
	8	16	31	26
	10	13	25	21
	12	11	20	17
	14	9	17	15
	16	8	15	13
	18	7	13	11

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

- a. Interpolation permitted. Extrapolation is not permitted.
- b. Ledgers shall be flashed in accordance with Section R703.4 to prevent water from contacting the house band joist.
- c. Dead load = 10 psf. Snow load shall not be assumed to act concurrently with live load.
- d. The tip of the lag screw shall fully extend beyond the inside face of the band joist.
- e. Sheathing shall be wood structural panel or solid sawn lumber.
- f. Sheathing shall be permitted to be wood structural panel, gypsum board, fiberboard, lumber or foam sheathing. Up to 1/2-inch thickness of stacked washers shall be permitted to substitute for up to 1/2 inch of allowable sheathing thickness where combined with wood structural panel or lumber sheathing.

R507.9.2 Deck lateral load connections. Lateral loads shall be transferred to the ground or to a structure capable of transmitting them to the ground. Where the lateral load connection is provided in accordance with Figure R507.9.2(1), hold-down tension devices shall be installed in not less than two locations per deck, within 24 inches of each end of the deck. Each device shall have an allowable stress design capacity of not less than 1500 pounds (6672 N). Where the lateral load connections are provided in accordance with Figure R507.9.2(2), the hold-down tension devices shall be installed in not less than four locations per deck, and each device shall have an allowable stress design capacity of not less than 750 pounds (3336 N).

EXCEPTION: Decks not more than 30 inches above grade at any point may be unattached.

TABLE R507.9.1
PLACEMENT OF LAG SCREWS AND BOLTS IN DECK LEDGERS AND BAND JOISTS

MINIMUM END AND EDGE DISTANCES AND SPACING BETWEEN ROWS				
	TOP EDGE	BOTTOM EDGE	ENDS	ROW SPACING
Ledger ^a	2 inches ^d	3/4 inch	2 inches ^b	1 5/8 inches ^b
Band joist ^e	3/4 inch	2 inches ^e	2 inches ^b	1 5/8 inches ^b

For SI: 1 inch = 25.4 mm.

- a. Lag screws or bolts shall be staggered from the top to the bottom along the horizontal run of the deck ledger in accordance with Figure R507.2.1(1).
- b. Maximum 5 inches.

- c. For engineered rim joists, the manufacturer's recommendations shall govern.
- d. The minimum distance from bottom row of lag screws to the top edge of the ledger shall be in accordance with Figure R507.2.1(1).
- e. The 2 inches may be reduced to 3/4 inch when the band joist is directly supported by a mudsill, a header or by double top wall plates.

TABLE R507.9.3(1)
DECK LEDGER CONNECTION TO BAND JOIST

LOAD ^c (psf)	JOIST SPAN ^a (feet)	1/2-inch diameter leg screw with 1/2-inch maximum sheathing ^{d,e}	1/2-inch diameter bolt with 1/2-inch maximum sheathing ^e	1/2-inch diameter bolt with 1-inch maximum sheathing ^f
		ON-CENTER SPACING OF FASTENERS ^b (inches)		
60 Ground Snow Load	6	25	36	36
	8	18	35	30
	10	15	28	24
	12	12	23	20
	14	10	20	17
	16	9	17	15
	18	8	15	13

LOAD ^c (psf)	JOIST SPAN ^a (feet)	1/2-inch diameter leg screw with 1/2-inch maximum sheathing ^{d,e}	1/2-inch diameter bolt with 1/2- inch maxi- mum sheathing ^e	1/2-inch diameter bolt with 1-inch maxi- mum sheath- ing ^f
		ON-CENTER SPACING OF FASTENERS ^b (inches)		
70 Ground Snow Load	6	22	36	35
	8	16	31	26
	10	13	25	21
	12	11	20	17
	14	9	17	15
	16	8	15	13
	18	7	13	11

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

- a. Interpolation permitted. Extrapolation not permitted.
- b. Legers shall be flashed in accordance with Section R703.4 to prevent water from contacting the house band joist.
- c. Dead Load = 10 psf. Snow load shall not be assumed to act concurrently with live load.
- d. The tip of the lag screw shall fully extend beyond the inside face of the band joist.
- e. Sheathing shall be wood structural panel or solid sawn lumber.
- f. Sheathing shall be permitted to be wood structural panel, gypsum board, fiberboard, lumber or foam sheathing. Up to 1/2 inch thickness of stacked washers shall be permitted to substitute for up to 1/2 inch of allowable sheathing thickness where combined with wood structural panel or lumber sheathing.

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

WAC 51-51-0602 Section R602—Wood wall framing.

~~((**R602.1.1 Sawn lumber.** Sawn lumber shall be identified by a grade mark of an accredited lumber grading or inspection agency and have design values certified by an accreditation body that complies with DOC PS 20. In lieu of a grade mark, a certification of inspection issued by a lumber grading or inspection agency meeting the requirements of this section shall be accepted.))~~

R602.1.1.1 Used sawn lumber. Used sawn lumber identified with a grade mark, in good condition and devoid of areas of decay shall be assumed to meet the requirements of Section 602.1.1 or shall comply with the following:

1. Dimensional lumber not identified with a grade mark that has a nominal thickness of 2 inches with a nominal width of 6 inches, or less, shall be assumed to be spruce-pine-fir stud grade and shall have structural properties assigned in accordance with current adopted standards. All other dimensional lumber shall be assumed to be hem-fir No. 2 grade and shall have structural properties assigned in accordance with current adopted standards.

R602.9 Cripple walls. Foundation cripple walls shall be framed of studs not smaller than the studding above. When exceeding 4 feet (1219 mm) in height, such walls shall be

framed of studs having the size required for an additional story.

Cripple walls supporting bearing walls or exterior walls or interior braced wall panels as required in Sections R403.1.2 and R602.10.9.1 with a stud height less than 14 inches (356 mm) shall be continuously sheathed on one side with wood structural panels fastened to both the top and bottom plates in accordance with Table R602.3(1), or the cripple walls shall be constructed of solid blocking. All cripple walls shall be supported on continuous footings or foundations.

EXCEPTION: Footings supporting cripple walls used to support interior braced wall panels as required in Sections R403.1.2 and R602.10.9.1 shall be continuous for the required length of the cripple wall and constructed beyond the cripple wall for a minimum distance of 4 inches and a maximum distance of the footing thickness. The footings extension is not required at intersections with other footings.

R602.10.10 Cripple wall bracing. Cripple walls shall be constructed in accordance with Section R602.9 and braced in accordance with this section. Cripple walls supporting bearing walls or exterior walls or interior braced wall panels as required in Section R403.1.2 shall be braced with the length and method of bracing used for the wall above in accordance with Tables R602.10.3(1) and R602.10.3(3), and the applicable adjustment factors in Table R602.10.3(2) or R602.10.3(4), respectively, except the length of the cripple wall bracing shall be multiplied by a factor of 1.15.

Where gypsum wall board is not used on the inside of the cripple wall bracing, the length adjustments for the elimination of the gypsum wallboard, or equivalent, shall be applied as directed in Tables R602.10.3(2) and R602.10.3(4) to the length of cripple wall bracing required. This adjustment shall be taken in addition to the 1.15 increase.

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

WAC 51-51-0703 Section R703—Exterior covering.

~~((**R703.1 General.** Exterior walls shall provide the building with a weather-resistant exterior wall envelope. The exterior wall envelope shall include flashing as described in Section R703.4.))~~

EXCEPTION: Log walls designed and constructed in accordance with the provisions of ICC 400.))

R703.1.1 Water resistance. The exterior wall envelope shall be designed and constructed in a manner that prevents the accumulation of water within the wall assembly by providing a water-resistant barrier behind the exterior veneer as required by Section R703.2 and a means of draining water that enters the assembly to the exterior. Protection against condensation in the exterior wall assembly shall be provided in accordance with Section R702.7 of this code.

EXCEPTIONS: 1. A weather-resistant exterior wall envelope shall not be required over concrete or masonry walls designed in accordance with Chapter 6 and flashed according to Section R703.4 or R703.8.

2. Compliance with the requirements for a means of drainage, and the requirements of Sections R703.2 and R703.4, shall not be required for an exterior wall envelope that has been demonstrated to resist wind-driven rain through testing of the exterior wall envelope, including joints, penetrations and intersections with dissimilar materials, in accordance with ASTM E 331 under the following conditions:

2.1. Exterior wall envelope test assemblies shall include at least one opening, one control joint, one wall/eave interface and one wall sill. All tested openings and penetrations shall be representative of the intended end-use configuration.

2.2. Exterior wall envelope test assemblies shall be at least 4 feet (1219 mm) by 8 feet (2438 mm) in size.

2.3. Exterior wall assemblies shall be tested at a minimum differential pressure of 6.24 pounds per square foot (299Pa).

2.4. Exterior wall envelope assemblies shall be subjected to a minimum test exposure duration of 2 hours. The exterior wall envelope design shall be considered to resist wind-driven rain where the results of testing indicate that water did not penetrate control joints in the exterior wall envelope; joints at the perimeter of opening penetration; or intersections of terminations with dissimilar materials.

3. The requirement for a means of drainage shall not be construed to mean an air space cavity under the exterior cladding for an exterior wall clad with panel or lapped siding made of plywood, engineered wood, hardboard, or fiber cement. A water-resistive barrier as required by Section R703.2 will be required on exterior walls.

R703.2 Water-resistive barrier. Not fewer than one layer of water-resistive barrier shall be applied over studs or sheathing with flashing as indicated in Section R703.4, in such a manner as to provide a continuous water resistive barrier behind the exterior wall veneer. Water-resistive barrier materials shall comply with one of the following:

1. No. 15 felt complying with ASTM D226, Type 1.
2. ASTM E2556, Type 1 or 2.
3. ASTM E331 in accordance with Section R703.1.1; or
4. Other approved materials in accordance with the manufacturer's installation instructions.

R703.4 Flashing. Approved corrosion-resistant flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structure framing components. Self-adhered membranes used as flashing shall comply with AAMA 711. Fluid-applied membranes used as flashing in exterior walls shall comply with AAMA 714. The flashing shall extend to the surface of the exterior wall finish. Approved corrosion-resistant flashing shall be installed at all of the following locations:

1. Exterior window and door openings. Flashing at exterior window and door openings shall extend to the surface of the exterior wall finish or to the water resistive barrier complying with Section 703.2 for subsequent drainage. Mechanically attached flexible flashings shall comply with AAMA 712.

2. At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings.

3. Under and at the ends of masonry, wood or metal copings and sills.

4. Continuously above all projecting wood trim.

5. Where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame construction.

6. At wall and roof intersections.

7. At built-in gutters.

R703.10.2 Lap siding. Fiber-cement lap siding having a maximum width of 12 inches (305 mm) shall comply with the requirements of ASTM C 1186, Type A, minimum Grade II or ISO 8336, Category A, minimum Class 2. Lap siding shall be lapped a minimum of 1 1/4 inches (32 mm) and lap siding shall be installed in accordance with the manufacturer's installation instructions or shall be designed to comply with Section R703.1. Lap siding courses shall be installed with the fastener heads exposed or concealed, in accordance with Table R703.3(1) or approved manufacturer's instructions.

AMENDATORY SECTION (Amending WSR 13-04-068, filed 2/1/13, effective 7/1/13)

WAC 51-51-1004 Section R1004—Factory-built fireplaces.

R1004.1.1 Emission standards for factory-built fireplaces. No new or used factory-built fireplace shall be installed in Washington state unless it is certified and labeled in accordance with procedures and criteria specified in ASTM E2558 Standard Test Method for determining particulate matter emission from fires in ((~~low mass~~)) wood burning fireplaces.

To certify an entire fireplace model line, the internal assembly shall be tested to determine its particulate matter emission performance. Retesting and recertifying is required if the design and construction specifications of the fireplace model line internal assembly change. Testing for certification shall be performed by a Washington state department of ecology (DOE) approved and U.S. Environmental Protection Agency (EPA) accredited laboratory.

R1004.1.2 Emission standards for certified masonry and concrete fireplaces. Masonry and concrete fireplace model lines certified to Washington State Building Code Standard 31-2 prior to July 1, 2013, may retain certification provided the design and construction specifications of the fireplace model line internal assembly do not change.

NEW SECTION

WAC 51-51-1503 Section M1503—Domestic cooking exhaust equipment.

M1503.2.1 Open-top broiler exhaust. Domestic open-top broiler units shall be provided with a metal exhaust hood, having a minimum thickness of 0.0157 inch (0.3950 mm) (No. 28 gage). Such hoods shall be installed with a clearance of not less than 1/4 inch (6.4 mm) between the hood and the underside of combustible material or cabinets. A clearance of

not less than 24 inches (610 mm) shall be maintained between the cooking surface and the combustible material or cabinets. The hood width shall not be less than the width of the broiler unit and shall extend over the entire unit.

- EXCEPTIONS:
1. Broiler units that incorporate an integral exhaust system, and that are listed and labeled for use without an exhaust hood, shall not be required to have an exhaust hood.
 2. Broiler units permanently installed outside the building envelope and having the cooking surface at least 5 feet below a 1-hour fire resistance rated ceiling shall not be required to have an exhaust hood.

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

WAC 51-51-4400 Referenced standards.

ANCE

NMX-J-521/2-40-ANCE—2019/CAN/CSA-22.2 No. 60335-2-40—19/UL 60335-2-40-2019 Household and Similar Electrical Appliances – Safety-Part 2-40((-Safety)): Particular Requirements for Electric Heat Pumps, Air-Conditioners and Dehumidifiers.

M1403.1, M1412.1, M1413.1

ANSI

LC 1/CSA 6.26—18: Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing (CSST)

G2414.5.4, G2411.3, G2415.5
403.5.5

ASHRAE

34—2019: Designation and Safety Classification of Refrigerants

M1411.1

ASTM

E2556/E2556M-10: Standard Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment.

M1411.1

E2558-2013: Standard Test Method for Determining Particulate Matter Emissions from Fires in Wood-burning Fireplaces

R1004.1.1

CSA

CAN/CSA/C22.2 No. 60335-2-40—2012 60335-2-40—2019

NMX-J-521/2-40-ANCE—2019/CAN/CSA-C22.2 No. 60335-2-40—19/UL 60335-2-40-2019 Household and Similar Electric Appliances, Part 2-40-Safety: Particular Requirements for Electric Heat Pumps, Air-Conditioners and Dehumidifiers.

M2006.1

UL

UL/CSA/ANCE 60335-2-40—2019 Household and Similar Electrical Appliances Safety-Part 2-40: Particular Requirements for Electrical Heat Pumps, Air Conditioners and Dehumidifiers.

M1403.1, M1412.1, M1413.1

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

WAC 51-51-60104 Appendix Q—Tiny houses.

AQ102 Definitions.

EGRESS ROOF ACCESS WINDOW. See Chapter 2.

LANDING PLATFORM. See Chapter 2.

LOFT. This definition is not adopted.

SLEEPING LOFT. See Chapter 2.

TINY HOUSE. A *dwelling unit* that is 400 square feet (37 m²) or less in floor area excluding *sleeping lofts*.

AQ103.1 Minimum ceiling height. Habitable space in tiny houses shall have a ceiling height of not less than 6 feet 8 inches (2032 mm). Bathrooms, toilet rooms and kitchens shall have a ceiling height of not less than 6 feet 4 inches (1930 mm). Obstructions including, but not limited to, beams, girders, ducts and lighting, shall not extend below these minimum ceiling heights.

EXCEPTION: Ceiling heights in *sleeping lofts* shall be in accordance with Section R326.

~~((AQ103 Ceiling height. This section is not adopted.))~~

AQ104 Energy conservation.

AQ104.1 Air leakage testing. The air leakage rate for tiny houses shall not exceed 0.30 cfm at 50 Pascals of pressure per foot of the dwelling unit enclosure area. Testing shall be conducted in accordance with RESNET/ICC 380, ASTM E 779 or ASTM E 1827 and reported at a pressure of 0.2 inch w.g. (50 Pascals). Where required by the code official, testing shall be conducted by an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. Testing shall be performed after the continuous air barrier, including all penetrations, is completed and sealed.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weather stripping or other infiltration control measures.

2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures.

3. Interior doors, if installed at the time of the test, shall be open.

4. Exterior louvers for continuous ventilation systems and heat recovery ventilators shall be closed and sealed.

5. Heating and cooling systems, if installed at the time of the test, shall be turned off.

6. Supply and return registers, if installed at the time of the test, shall be fully open.

~~((AQ104 Lofts. This section is not adopted.))~~

AQ104.1.1 Whole house mechanical ventilation. Where an air leakage rate not exceeding 0.30 cfm per ft of the dwelling unit enclosure area in accordance with Section AQ106.1 is provided, the tiny house shall be provided with whole house mechanical ventilation in accordance with Section M1505.4.

AQ105 Emergency escape and rescue openings. This section is not adopted.

AMENDATORY SECTION (Amending WSR 20-03-023, filed 1/6/20, effective 7/1/20)

WAC 51-51-60105 Appendix U—Dwelling unit fire sprinkler systems. The design and installation of residential fire sprinkler systems shall be in accordance with the 2018 International Residential Code Section P2904 Dwelling Unit Fire Sprinkler Systems.

P2904.1.1 Required sprinkler locations. Sprinklers shall be installed to protect all areas of a dwelling unit.

EXCEPTIONS:

1. Uninhabitable attics, crawl spaces and normally unoccupied concealed spaces that do not contain fuel-fired appliances do not require sprinklers. In uninhabitable attics, crawl spaces and normally unoccupied concealed spaces that contain fuel-fired equipment, a sprinkler shall be installed above the equipment; however, sprinklers shall not be required in the remainder of the space.
2. Clothes closets, linen closets and pantries not exceeding 24 square feet (2.2 m²) in area, with the smallest dimension not greater than 3 feet (915 mm) and having wall and ceiling surfaces of gypsum board.
3. Bathrooms not more than 55 square feet (5.1 m²) in area.
4. Garages; carports; exterior porches; unheated entry areas, such as mud rooms, that are adjacent to an exterior door; and similar areas.

AMENDATORY SECTION (Amending WSR 16-03-025, filed 1/11/16, effective 7/1/16)

WAC 51-51-60106 Appendix ((U)) I—Solar-ready provisions—detached one-and two-family dwellings, multiple single-family dwellings (townhouses). The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

((U101)) AT101 Scope.

((U101.1)) AT101.1 General. These provisions shall be applicable for new construction where solar-ready provisions are required.

((U102)) AT102 General definitions. Solar-ready zone. A section or sections of the roof or building overhang designated and reserved for the future installation of a solar photovoltaic or solar water-heating system.

((U103)) AT103 Solar ready zone.

((U103.1)) AT103.1 General. New detached one- and two-family dwellings, and multiple single-family dwellings (townhouses) with not less than 600 square feet (55.74 m²) of roof area oriented between 90 degrees and 270 degrees of true north shall comply with Sections U103.2 through U103.10.

EXCEPTIONS:

1. New residential buildings with a permanently installed on-site renewable energy system.
2. A building where all areas of the roof that would otherwise meet the requirements of Section ((U103)) **AT103** are in full or partial shade for more than 70 percent of daylight hours annually.

((U103.2)) AT103.2 Construction document requirements for solar ready zone. Construction documents shall indicate the solar ready zone.

((U103.3)) AT103.3 Solar-ready zone area. The total solar-ready zone area shall be not less than 300 square feet (27.87 m²) exclusive of mandatory access or set back areas as required by this code. New multiple single-family dwellings (townhouses) three stories or less in height above grade plane and with a total floor area less than or equal to 2,000 square feet (185.8 m²) per dwelling shall have a solar-ready zone area of not less than 150 square feet (13.94 m²). The solar-ready zone shall be composed of areas not less than 5 feet (1.52 m) in width and not less than 80 square feet (7.44 m²) exclusive of access or set back areas as required in this code or the applicable provisions of the *International Fire Code*. No portion of the solar zone shall be located on a roof slope greater than 2:12 that faces within 45 degrees of true north.

((U103.4)) AT103.4 Obstructions. Solar-ready zones shall be free from obstructions including, but not limited to, vents, chimneys, and roof-mounted equipment.

((U103.5)) AT103.5 Shading. The solar-ready zone shall be set back from any existing or new permanently affixed object on the building or site that is located south, east, or west of the solar zone a distance at least two times the object's height above the nearest point on the roof surface. Such objects include, but are not limited to, taller portions of the building itself, parapets, chimneys, antennas, signage, rooftop equipment, trees and roof plantings.

((U103.6)) AT103.6 Capped roof penetration sleeve. A capped roof penetration sleeve shall be provided adjacent to a solar-ready zone when the solar-ready zone has a roof slope of 2:12 or less. The capped roof penetration sleeve shall be sized to accommodate the future photovoltaic system conduit, but shall have an inside diameter not less than 1 1/4 inches.

((U103.7)) AT103.7 Roof load documentation. The structural design loads for roof dead load and roof live load shall be clearly indicated on the construction documents.

((U103.8)) AT103.8 Interconnection pathway. Construction documents shall indicate pathways for routing of conduit or plumbing from the solar-ready zone to the electrical service panel or service hot water system.

((U103.9)) AT103.9 Electrical service reserved space. The main electrical service or feeder panel for each dwelling unit shall have a reserved space to allow installation of a dual pole circuit breaker for future solar electric installation and shall be labeled "For Future Solar Electric." The reserved space shall be positioned at the opposite (load) end from the input feeder location or main circuit location.

~~(U103-10)~~ **AT103.10 Construction documentation certificate.** A permanent certificate, indicating the solar-ready zone and other requirements of this section, shall be posted near the electrical distribution panel, water heater or other conspicuous location by the builder or registered design professional.

WSR 20-16-104
EXPEDITED RULES
EMPLOYMENT SECURITY DEPARTMENT

[Filed July 31, 2020, 10:08 a.m.]

Title of Rule and Other Identifying Information: Technical corrections to WAC 192-170-010, 192-320-070, 192-320-075, 192-320-080, 192-320-081, 192-320-082, 192-320-083, and 192-320-084.

Purpose of the Proposal and Its Anticipated Effects, Including Any Changes in Existing Rules: The rule change corrects numbering within the WAC created from rules adopted in WSR 20-11-022 and 20-10-056. It also corrects cross-references to subsections of RCW 50.29.021, which was amended in 2020 by the legislature in SHB 2613, section 3, chapter 86, Laws of 2020.

Reasons Supporting Proposal: WSR 20-11-022 and 20-10-056 each went into effect on July 5, 2020. The amended rule will correct internal references within WAC 192-170-010. SHB 2613, chapter 86, Laws of 2020, went into effect on June 11, 2020. The amended rule will correct cross-references to a statute amended by that bill.

Statutory Authority for Adoption: RCW 50.12.010 and 50.12.040 provide general rule-making authority to the employment security department (ESD).

Statute Being Implemented: RCW 50.20.010, 50.20.230, and 50.20.240.

Rule is not necessitated by federal law, federal or state court decision.

Name of Proponent: ESD, governmental.

Name of Agency Personnel Responsible for Drafting: Scott Michael, Olympia, 360-890-3448; Implementation and Enforcement: Julie Lord, Olympia, 360-890-9579.

This notice meets the following criteria to use the expedited adoption process for these rules:

Corrects typographical errors, make address or name changes, or clarify language of a rule without changing its effect.

Content is explicitly and specifically dictated by statute.

Explanation of the Reason the Agency Believes the Expedited Rule-Making Process is Appropriate: The rule change corrects numbering within the WAC created from rules adopted in WSR 20-11-022 and 20-10-056. It also corrects cross-references to subsections of RCW 50.29.021, which was amended in 2020 by the legislature in SHB 2613, section 3, chapter 86, Laws of 2020.

NOTICE

THIS RULE IS BEING PROPOSED UNDER AN EXPEDITED RULE-MAKING PROCESS THAT WILL ELIMINATE THE NEED FOR THE AGENCY TO HOLD

PUBLIC HEARINGS, PREPARE A SMALL BUSINESS ECONOMIC IMPACT STATEMENT, OR PROVIDE RESPONSES TO THE CRITERIA FOR A SIGNIFICANT LEGISLATIVE RULE. IF YOU OBJECT TO THIS USE OF THE EXPEDITED RULE-MAKING PROCESS, YOU MUST EXPRESS YOUR OBJECTIONS IN WRITING AND THEY MUST BE SENT TO Joshua Dye, ESD, P.O. Box 9046, Olympia, WA 98507-9046, phone 360-890-3472, fax 844-652-7096, email rules@esd.wa.gov, TTD [TDD] relay 711, AND RECEIVED BY October 5, 2020.

July 31, 2020
Dan Zeitlin
Policy Director

AMENDATORY SECTION (Amending WSR 20-11-022, filed 5/13/20, effective 7/5/20)

WAC 192-170-010 Availability for work—RCW 50.20.010. (1) In general, the department will consider you available for work if you:

(a) Are willing to work full-time, part-time, and accept temporary work during all of the usual hours and days of the week customary for your occupation.

(i) You are not required to be available for part-time or temporary work if it would substantially interfere with your return to your regular occupation.

(ii) The requirement to be available for full-time work does not apply under the circumstances described in WAC 192-170-050 (1)(b) or 192-170-070;

(b) Are capable of accepting and reporting for any suitable work within the labor market in which you are seeking work;

(c) Do not impose conditions that substantially reduce or limit your opportunity to return to work at the earliest possible time;

(d) Are available for work during the hours customary for your trade or occupation; and

(e) Are physically present in your normal labor market area, unless you are actively seeking and willing to accept work outside your normal labor market.

(2) ~~((f))~~ You are considered available for work if you are an active registered electrical apprentice in an approved electrical apprenticeship program under chapter 49.04 RCW and chapter 296-05 WAC.

(3) ~~((g))~~ You are not considered available for work if you fail or refuse to seek work as required in a directive issued by the department under WAC 192-180-010.

~~((h))~~ (4) If you are physically located outside of the United States, Puerto Rico, or the U.S. Virgin Islands, the department will consider you available for work if you meet the requirements of subsections (1) and (2) of this section, and:

(a) You are legally authorized to work in the country in which you are physically located;

(b) You are immediately available for work in the United States; or

(c) You are a spouse or domestic partner of a member of the United States Armed Forces and you are legally authorized to work within the foreign military base where your spouse or domestic partner is stationed.

AMENDATORY SECTION (Amending WSR 10-23-064, filed 11/12/10, effective 12/13/10)

WAC 192-320-070 What conditions apply for relief of benefit charges due to a voluntary quit? (RCW 50.29-021.) (1) A contribution-paying base year employer, who has not been granted relief of charges under RCW 50.29.021 (~~((3))~~) **(2)**, may request relief of charges for a voluntary quit not attributable to the employer under RCW 50.29.021(~~((4))~~) **(3)** and WAC 192-320-065. This section does not apply to local governments.

(2) Reasons for a voluntary quit not attributable to the employer. A claimant may have been denied unemployment benefits for voluntarily quitting work without good cause, but subsequently requalify for unemployment benefits through work and earnings. Even if the claimant has requalified for benefits, the following reasons for leaving work will be considered reasons not attributable to the employer:

(a) The claimant's illness or disability or the illness, disability or death of a member(s) of the claimant's immediate family;

(b) The claimant's domestic responsibilities;

(c) Accepting a job with another employer;

(d) Relocating for a spouse's or domestic partner's employment;

(e) Starting or resuming school or training;

(f) Being in jail;

(g) The distance to the job site when the job was accepted and the distance at the time of the quit remained the same; or the job location may have changed but the distance traveled or difficulty of travel was not increased;

(h) Being dissatisfied with wages, hours or other working conditions generally known when the job was accepted; and the working conditions are determined suitable for the occupation in the claimant's labor market; and

(i) Separation necessary to protect the claimant or any member of the claimant's immediate family from domestic violence or stalking; and

(j) Entry into an apprenticeship program approved by the Washington state apprenticeship training council.

(3) Reasons for a voluntary quit considered attributable to employer are those work-related factors of such a compelling nature as to cause a reasonably prudent person to leave employment. The work factors must have been reported to the employer if the employer has reasons not to be aware of the conditions, and the employer failed to improve the factors within a reasonable period of time. The reason for quitting may or may not have been determined good cause for voluntarily leaving work under RCW 50.20.050. For benefit charging purposes, however, such work-related factors may include, but are not limited to:

(a) Change in work location which causes an increase in distance and/or difficulty of travel, but only if it is clearly greater than is customary for workers in the individual's classification and labor market;

(b) Deterioration of work site safety provided the employee has reported such safety deterioration to the employer and the employer has failed to correct the hazards within a reasonable period of time;

(c) Employee skills no longer required for the job;

(d) Unreasonable hardship on the health or morals of the employee;

(e) Reductions in hours;

(f) Reduction in pay;

(g) Notification of impending layoff; and

(h) Other work-related factors the commissioner considers pertinent.

AMENDATORY SECTION (Amending WSR 04-23-058, filed 11/15/04, effective 12/16/04)

WAC 192-320-075 Charges to the separating employer—RCW 50.29.021 (~~((2))~~) **(1)(c).** (1) If a claimant voluntarily quits work to accept a job with a new employer, one hundred percent of benefits paid on the claim will be charged to the new employer when this new employer is the claimant's last employer, a base period employer, and a contribution-paying employer.

(2) If a claimant quits work because of the working conditions listed in this subsection, the employer from whom the separation occurred will be charged for one hundred percent of benefits paid on the claim if the employer is the claimant's last employer, a base period employer, and a contribution-paying employer. These working conditions include:

(a) A reduction in the individual's usual compensation of twenty-five percent or more under WAC 192-150-115;

(b) A reduction in the individual's usual hours of twenty-five percent or more under WAC 192-150-120;

(c) A change in the work location which caused a substantial increase in distance or difficulty of travel under WAC 192-150-125;

(d) A deterioration in the individual's worksite safety under WAC 192-150-130;

(e) Illegal activities in the individual's worksite under WAC 192-150-135; or

(f) The individual's usual work was changed to work that violates the individual's religious convictions or sincere moral beliefs under WAC 192-150-140.

(3) Benefits based on wages paid by the following entities will **not** be charged to the experience-rating account of the separating employer as described in subsections (1) and (2) if they were earned:

(a) In another state;

(b) From a local government employer;

(c) From the federal government; or

(d) From any branch of the United States military.

AMENDATORY SECTION (Amending WSR 16-21-013, filed 10/7/16, effective 11/14/16)

WAC 192-320-080 Overpayments caused by incorrect reporting of wages and hours—RCW 50.12.070 **(2) (b) and 50.29.021 (~~((3)(a))~~) **(4).**** (1) When an employer incorrectly reports an individual's wages or hours, and the claim becomes invalid due to a later correction in wages or hours, the department will charge that employer one hundred percent of benefits paid to that individual, except as provided in subsection (3) of this section.

(2) When an employer incorrectly reports an individual's wages and a claimant's weekly benefit amount or maximum benefits payable is reduced due to a later correction in wages,

the department will charge that employer for the benefits that should not have been paid, but nonetheless were paid as a result of the employer's incorrect reports, except as provided in subsection (3) of this section.

(3) This section does not apply to the entities listed below. The department will charge only for the percentage of benefits that represent their percentage of base period wages. These include wages earned:

- (a) In another state;
- (b) From a local government employer;
- (c) From the federal government; or
- (d) From any branch of the United States military.

AMENDATORY SECTION (Amending WSR 13-24-108, filed 12/3/13, effective 1/3/14)

WAC 192-320-081 What constitutes an "event" for the purpose of determining if there is a pattern of failing to respond timely or adequately?—RCW 50.29.021(~~(6)~~) (5). (1) An event occurs if a benefit overpayment is created and the employer or the employer's agent significantly contributed to the overpayment by failing to respond timely or adequately without good cause to the department's written request for information relating to a claim.

(2) When deciding if an event has occurred, there must be a decision made by the department resulting in a benefit overpayment.

(3) An event may occur even if the employer is not in the base year of the claim.

(4) The department must examine past events which contributed to benefit overpayments when deciding if a pattern exists.

AMENDATORY SECTION (Amending WSR 13-24-108, filed 12/3/13, effective 1/3/14)

WAC 192-320-082 How will the department determine good cause exists for failing to respond timely or adequately?—RCW 50.29.021(~~(6)~~) (5). (1) The department may find that good cause exists in certain situations when the employer fails to respond due to an unforeseen event outside of the employer's or employer's agent's control, such as:

- (a) The death or serious illness of the employer;
- (b) Destruction of the employer's place of business or business records not caused by, or at the direction of, the employer or the employer's agent;
- (c) Fraud or theft against the employer.

(2) The employer is responsible to provide all pertinent facts and evidence or documentation for the department to determine good cause.

AMENDATORY SECTION (Amending WSR 13-24-108, filed 12/3/13, effective 1/3/14)

WAC 192-320-083 What is a written request for information?—RCW 50.29.021(~~(6)~~) (5). For the purposes of this chapter, a written request for information relating to a claim is a paper or electronic transmission by the department requesting information from an employer or an employer's agent.

AMENDATORY SECTION (Amending WSR 13-24-108, filed 12/3/13, effective 1/3/14)

WAC 192-320-084 What is an employer's agent?—RCW 50.29.021(~~(6)~~) (5). For the purposes of this chapter, the employer's agent is the employer's designated representative responsible for providing information to the department.

WSR 20-16-142
EXPEDITED RULES
DEPARTMENT OF
LABOR AND INDUSTRIES

[Filed August 4, 2020, 12:15 p.m.]

Title of Rule and Other Identifying Information: eRules Phase 10: Chapter 296-307 WAC, Safety standards for agriculture, Parts B through H, J through N, P through Y-10.

Purpose of the Proposal and Its Anticipated Effects, Including Any Changes in Existing Rules: This rule making is part of the division of occupational safety and health (DOSH) eRules project. This rule making will not add or change any requirements; the purpose is to provide consistency in formatting, design and accessibility to the rules via mobile electronic devices.

This rule making will accomplish the following:

- Consistent format for all DOSH rules.
- Easy to access rules for smart phone and tablet users.
- Easy navigation in PDF files provided through bookmarks in the rules.
- Easier referencing by replacing bullets and dashes with numbers and letters.
- Enhanced rule update efficiency for customers through electronic postings.

On March 18, 2020, the department withdrew the CR-102 (WSR 20-05-074) for eRules Phase 10 originally filed on February 18, 2020, canceling the public hearing set for March 24, 2020. On June 29, 2020, the department also withdrew the CR-101 (WSR 17-02-065) for eRules Phase 10 filed on January 3, 2017. This was due to the ongoing public health emergency caused by the coronavirus (COVID-19) outbreak, which has resulted in limited and restricted in-person gatherings, and the department of labor and industries (L&I) limiting the occurrence of public hearings for rule making.

Amended Sections:

WAC 296-307-030 (Part B) through 296-307-10025 (Part H), 296-307-145 (Part J) through 296-307-24036 (Part N); and 296-307-280 (Part P) through 296-307-70480 (Part Y-10).

- Change "you" to "the employer" or "the operator" where applicable.
- Change "you have" to "the employer has" where applicable.
- Change bullets and other symbols to letters or numbers where applicable.
- Change "shall" to "must" where applicable.
- Remove numbers and quotation marks from all defined words.

- Remove words/phrases such as "means," "as defined" or "is an" from all applicable definitions and replace it with a period, making all definitions complete sentences.
- Website addresses and links corrected, where needed.
- Update titles of WAC sections to remove question format.

WAC 296-307-039 First-aid rule summary.

- Update titles of WAC sections embedded in the WAC to agree with updated titles noted.

WAC 296-307-03905 Make sure that first-aid trained personnel are available to provide quick and effective first aid.

- This WAC has language from 29 C.F.R. 1910.151(b) embedded. Update the language to agree with the C.F.R. as currently written.

WAC 296-307-05505 How must orchard ladders be used?

- Rearrange order of items. Prohibited behaviors are now listed together, and at the beginning of the section. Previously, prohibited behaviors were numbered 1 and 4, and are now 1 and 2.

WAC 296-307-085 When must ROPS be provided for material handling equipment?

- The WAC has language from OSHA 1928.52 C.F.R. embedded. Update the language to agree with the C.F.R. as currently written.

WAC 296-307-18010 How must constant-running drives be guarded?

- Definition of "constant-running drives" moved from end of section to beginning for better understanding.

WAC 296-307-24012 How must the potable water supply be maintained?

- Rearrange order of items.
- Prohibited behavior is now listed at the beginning of the section. Previously, prohibited behavior was the last item in the list.

Reasons Supporting Proposal: When the agency updated its website, DOSH rules in HTML were broken and DOSH began forwarding rule users to the office of the code reviser website, causing more confusion among customers. These amendments will resolve stakeholder issues that have caused confusion for rule users by bringing one clear and consistent format to all of our rules.

Statutory Authority for Adoption: RCW 49.17.010, 49.17.040, 49.17.050, 49.17.060.

Statute Being Implemented: Chapter 49.17 RCW.

Rule is not necessitated by federal law, federal or state court decision.

Name of Proponent: L&I, governmental.

Name of Agency Personnel Responsible for Drafting: Chris Miller, Tumwater, Washington, 360-902-5516; Implementation and Enforcement: Anne Soiza, Tumwater, Washington, 360-902-5090.

This notice meets the following criteria to use the expedited adoption process for these rules:

Corrects typographical errors, make address or name changes, or clarify language of a rule without changing its effect.

Explanation of the Reason the Agency Believes the Expedited Rule-Making Process is Appropriate: No requirements are being changed during this rule making, only clarifying language and updating errors, which fits within the parameters of RCW 34.05.353 Expedited rule making.

NOTICE

THIS RULE IS BEING PROPOSED UNDER AN EXPEDITED RULE-MAKING PROCESS THAT WILL ELIMINATE THE NEED FOR THE AGENCY TO HOLD PUBLIC HEARINGS, PREPARE A SMALL BUSINESS ECONOMIC IMPACT STATEMENT, OR PROVIDE RESPONSES TO THE CRITERIA FOR A SIGNIFICANT LEGISLATIVE RULE. IF YOU OBJECT TO THIS USE OF THE EXPEDITED RULE-MAKING PROCESS, YOU MUST EXPRESS YOUR OBJECTIONS IN WRITING AND THEY MUST BE SENT TO Chris Miller, Department of Labor and Industries, P.O. Box 44610, Olympia, WA 98504-4610, phone 360-902-5516, fax 360-902-5619, email Christopher.miller@Lni.wa.gov, AND RECEIVED BY, AND RECEIVED BY October 5, 2020.

August 4, 2020
Joel Sacks
Director

AMENDATORY SECTION (Amending WSR 09-07-098, filed 3/18/09, effective 5/1/09)

WAC 296-307-030 (~~What are the~~) Required elements of an accident prevention program(~~?~~). (1) (~~You~~) The employer 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) (~~Your~~) The employer must develop a written accident prevention program tailored to the needs of (~~your~~) the employer's agricultural operation and to the types of hazards involved.

(3) (~~Your~~) The employer's 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, (~~your~~) the employer 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 (~~your~~) the employer.

Note: Additional requirements in Part G-1, WAC 296-307-097, Outdoor heat exposure, may apply. Employers may address their outdoor heat exposure safety program either in their written accident prevention program (APP) or as a stand-alone written document. See Part G-1.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-033 Requirements for how often ~~((must))~~ safety meetings must be held~~((?))~~. (1) Foreman-crew safety meetings:

- (a) ~~Must~~ be held at least monthly; or
(b) Whenever there are significant changes in job assignments.
(c) 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))~~ The employer 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))~~ The employer must retain minutes of foreman-crew safety meetings for one year and be able to show us copies if we ask to see them.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-036 ~~((What))~~ Items to go on the safety bulletin board~~((?))~~. (1) ~~((You))~~ The employer 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))~~ the employer 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.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-039 First-aid rule summary. ~~((Your))~~ Employer's responsibility: Make sure first-aid trained personnel are available to provide quick and effective first aid.

~~((You must:
Make sure that first-aid trained personnel are available to provide quick and effective first aid.
WAC 296-307-03905.~~

~~Make sure appropriate first-aid supplies are readily available.~~

~~WAC 296-307-03920.)~~

Table with 2 columns: 'The employer must meet the requirements...' and 'in this section:'. Row 1: 'Make sure that first-aid trained personnel are available to provide quick and effective first aid.' / 'WAC 296-307-03905'. Row 2: 'Make sure appropriate first-aid supplies are readily available.' / 'WAC 296-307-03920'.

- Notes:
((*) 1. Employers who require their employees to provide first aid must comply with the bloodborne pathogen rule, chapter 296-823 WAC .
((*) 2. Additional requirements relating to first aid are also located in the following sections:
((-) a. WAC 296-307-07013(12), ~~((What))~~ Rules that apply to vehicles used to transport employees~~((?))~~.
((-) b. WAC 296-307-16175, First-aid ~~((requirements for operators of temporary-worker-housing))~~ and safety.
((-) c. WAC 296-307-16380, First-aid requirements for operators of cherry harvest camps.

Definitions:

First aid: The extent of treatment ~~((you))~~ the employer would expect from a person trained in basic first aid, using supplies from a first-aid kit.

Emergency medical service: Medical treatment and care given at the scene of any medical emergency or while transporting any victim to a medical facility.

~~((You))~~ The employer can get copies of these rules by calling 1-800-4BE SAFE (1-800-423-7233), or by going to http://www.lni.wa.gov.

AMENDATORY SECTION (Amending WSR 04-07-160, filed 3/23/04, effective 5/1/04)

WAC 296-307-03905 Make sure that first-aid trained personnel are available to provide quick and effective first aid.

~~((You must:))~~

The employer must comply with the first-aid training requirements of 29 C.F.R. 1910.151(b) which states:

"In the absence of an infirmary, clinic, or hospital in near proximity to the workplace which is used for the treatment of all injured employees, a person or persons shall be adequately trained to render first aid. Adequate first-aid supplies shall be readily available."

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-03920 Make sure appropriate first-aid supplies are readily available. ~~((You must:~~

~~*) (1) The employer must make sure first-aid supplies are readily available. (See first-aid kit table.)~~

~~((at your))~~ **(2)** The employer must make sure first-aid supplies in workplace are appropriate to:

~~((You))~~ **(a)** The employer's occupational setting.

~~((you))~~ **(b)** The response time of ~~((your))~~ the employer's emergency medical services.

First-Aid Kit Table

Number of employees normally assigned to worksite	Minimum first-aid supplies required at worksite
1 - 15 Employees	1 First-aid kit
16 - 30 Employees	2 First-aid kits
31 - 50 Employees	3 First-aid kits

- Notes:**
- ~~((you))~~ **1.** First-aid kits from ~~((your))~~ a local retailer or safety supplier should be adequate for most nonindustrial employers.
 - ~~((you))~~ **2.** The following is a list of suggested items for ~~((your))~~ the first-aid kit:
 - ~~((-))~~ **a.** 1 absorbent compress, 4 x 8 inches.
 - ~~((-))~~ **b.** 16 adhesive bandages, 1 x 3 inches.
 - ~~((-))~~ **c.** 1 adhesive tape, 5 yards long.
 - ~~((-))~~ **d.** 10 antiseptic single-use packages, 0.5 g application.
 - ~~((-))~~ **e.** 6 burn treatment single-use packages, 0.5 g application.
 - ~~((-))~~ **f.** 1 eye covering (for two eyes).
 - ~~((-))~~ **g.** 1 eye wash, 1 fluid ounce.
 - ~~((-))~~ **h.** 4 sterile pads, 3 x 3 inches.
 - ~~((-))~~ **i.** 2 pair of medical exam gloves.
 - ~~((-))~~ **j.** 1 triangular bandage, 39 x 39 x 55 inches.
 - 3.** Optional first-aid kit contents:
 - ~~((-))~~ **a.** Bandage compresses, 2 x 2 inches, 3 x 3 inches and 5 x 5 inches.
 - ~~((-))~~ **b.** Self-activating cold packs, 4 x 5 inches.
 - ~~((-))~~ **c.** Roller bandages, 6 yards long.
 - ~~((-))~~ **d.** Mouth-to-mouth barrier for CPR.
 - ~~((-))~~ **4.** Kits should be checked at least weekly to ensure adequate number of needed items are available.
 - ~~((-))~~ **5.** Kits may be carried in any motor vehicle that is used near the crew.

~~((You must:))~~

~~((-))~~ **(3)** The employer must make sure that first-aid supplies are:

~~((-))~~ **(a)** Easily accessible to all ~~((your))~~ employees.

~~((-))~~ **(b)** Stored in containers that protect them from damage, deterioration, or contamination. Containers must be clearly marked, not locked, and may be sealed.

~~((-))~~ **(c)** Able to be moved to the location of an injured or acutely ill worker.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-03930 Make sure emergency washing facilities are functional and readily accessible.

~~((You must:))~~

~~((-))~~ **(1)** The employer must provide an emergency shower:

~~((-))~~ **(a)** When there is potential for major portions of an employee's body to contact corrosives, strong irritants, or toxic chemicals.

~~((-))~~ **(b)** That delivers water to cascade over the user's entire body at a minimum rate of 20 gallons (75 liters) per minute for fifteen minutes or more.

~~((-))~~ **(2)** The employer must provide an emergency eye-wash:

~~((-))~~ **(a)** When there is potential for an employee's eyes to be exposed to corrosives, strong irritants, or toxic chemicals.

~~((-))~~ **(b)** That irrigates and flushes both eyes simultaneously while the user holds their eyes open.

~~((-))~~ **(c)** With an on-off valve that activates in one second or less and remains on without user assistance until intentionally turned off.

~~((-))~~ **(d)** That delivers at least 0.4 gallons (1.5 liters) of water per minute for fifteen minutes or more.

Note: Chemicals that require emergency washing facilities:

~~((-You))~~ **1.** The employer can determine whether chemicals in ~~((your))~~ the workplace require emergency washing facilities by looking at the material safety data sheet (MSDS) or similar documents. The MSDS contains information about first-aid requirements and emergency flushing of skin or eyes.

~~((-))~~ **2.** For chemicals developed in the workplace, the following resources provide information about first-aid requirements:

~~((-))~~ **a.** NIOSH Pocket Guide to Chemical Hazards;

~~((-))~~ **b.** *DHHS (NIOSH) Publication No. 97-140;

~~((-http://www.cdc.gov/niosh/npg/ggdstart.html))~~ **c.**

<https://www.cdc.gov/niosh/npg>;

~~((-))~~ **d.** Threshold Limit Values for Chemical Substances and Physical Agents American Conference of Governmental Industrial Hygienists (ACGIH).

~~((You must:))~~

~~((-))~~ **(3)** The employer must make sure emergency washing facilities:

~~((-))~~ **(a)** Are located so that it takes no more than ten seconds to reach;

~~((-))~~ **(b)** Are kept free of obstacles blocking their use;

~~((-))~~ **(c)** Function correctly; and

~~((-))~~ **(d)** Provide the quality and quantity of water that is satisfactory for emergency washing purposes.

Notes: ~~((-))~~ **1.** If water in emergency washing facilities is allowed to freeze, they will not function correctly. Precautions need to be taken to prevent this from happening.

~~((-))~~ **2.** The travel distance to an emergency washing facility should be no more than fifty feet (15.25 meters).

~~((-))~~ **3.** For further information on the design, installation, and maintenance of emergency washing facilities, see American National Standards Institute (ANSI) publication Z358.1 - 1998, *Emergency Eyewash and Shower Equipment*. Emergency washing facilities that are designed to meet ANSI Z358.1 - 1998 also meet the requirements of this standard. The ANSI standard can be obtained from the American National Standards Institute, 1430 Broadway, New York, New York 10018.

Reference: ~~((-))~~ Training in the location and use of ~~((your))~~ the employer's emergency washing facilities is required under the employer chemical hazard communication rule, WAC 296-307-550, and the accident prevention program rule, WAC 296-307-030.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-03935 Inspect and activate ~~((your))~~ emergency washing facilities.

~~((You must:~~

*) (1) The employer must make sure all plumbed emergency washing facilities are inspected once a year to make sure they function correctly.

Note: Inspections should include:

- (*) 1. Examination of the piping.
- (*) 2. Making sure that water is available at the appropriate temperature and quality.
- (*) 3. Activation to check that the valves and other hardware work properly.
- (*) 4. Checking the water flow rate.

~~((You must:~~

*) (2) The employer must make sure plumbed emergency eyewashes and hand-held drench hoses are activated weekly to check the proper functioning of the valves, hardware, and availability of water.

(*) (3) The employer must make sure all self-contained eyewash equipment and personal eyewash units are inspected and maintained according to manufacturer instructions.

(-) (a) Inspections to check proper operation must be done once a year.

(-) (b) Sealed personal eyewashes must be replaced after the manufacturer's expiration date.

Note: Most manufacturers recommend replacing fluid in open self-contained eyewashes every six months. The period for sealed containers is typically two years.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-03940 Make sure supplemental flushing equipment provides sufficient water.

Note: Supplemental flushing equipment cannot be used in place of required emergency showers or eyewashes.

~~((You must:~~

*) (1) The employer must make sure hand-held drench hoses deliver at least 3.0 gallons (11.4 liters) of water per minute for fifteen minutes or more.

Note: Why use a drench hose? A drench hose is useful when:

- (*) 1. The spill is small and does not require an emergency shower.
- (*) 2. Used with a shower for local rinsing, particularly on the lower extremities.

~~((You must:~~

*) (2) The employer must make sure personal eyewash equipment delivers only clean water or other medically approved eye flushing solutions.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-03945 Definitions.

Corrosive (as used in first aid, WAC 296-307-039(-is)). A substance that causes destruction of living tissue by

chemical action, including acids with a pH of 2.5 or below or caustics with a pH of 11.0 or above.

Emergency washing facilities. Emergency washing facilities are emergency showers, eyewashes, eye/face washes, hand-held drench hoses, or other similar units.

Hand-held drench hoses. Hand-held drench hoses are single-headed emergency washing devices connected to a flexible hose that can be used to irrigate and flush the face or other body parts.

Personal eyewash units. Personal eyewash units are portable, supplementary units that support plumbed units or self-contained units, or both, by delivering immediate flushing for less than fifteen minutes.

Strong irritant (as used in first aid, WAC 296-307-039(-is)). A chemical that is not corrosive, but causes a strong, temporary inflammatory effect on living tissue by chemical action at the site of contact.

Toxic chemical (as used in first aid, WAC 296-307-039(-is)). A chemical that produces serious injury or illness when absorbed through any body surface.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-045 ~~((What are the))~~ Requirements ~~((of the))~~ for safe place standard(?). (1) ~~((You))~~ The employer must furnish to each employee a place of employment free from recognized controllable hazards likely to cause serious injury or death.

(2) ~~((You))~~ The employer 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))~~ The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-050 ~~((What))~~ Requirements that 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))~~ The employer must ensure that hand tools are in good condition. Using defective hand tools is prohibited.

(3) ~~((You))~~ The employer must ensure that hand tools are stored safely when not in use.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-05501 (~~(How must ladders be cared for and maintained?)~~) Ladder care and maintenance. (1) Ladders must be checked for defects before use, and thoroughly inspected periodically. Ladders ~~((shall))~~ must 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))~~ the employer is 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-05503 (~~(How must an employer instruct employees to use ladders?)~~) Instructing employees on the use of ladders. (1) At the beginning of employment, ~~((you))~~ the employer 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))~~ the employer must instruct employees to avoid overreaching while standing on the ladder.

(3) ~~((You))~~ The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-05505 (~~(How must))~~ Use of orchard ladders (~~(be used?)~~). (1) Orchard ladders longer than sixteen feet are prohibited.

(2) Standing on the top two steps of the orchard ladder is prohibited.

(3) Employers must instruct employees to not stand on the top two steps (the top cap and the next step down) of orchard ladders.

~~((3))~~ (4) 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.)~~

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-05507 (~~(What other))~~ Ladder 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-060 ~~((What))~~ **Requirements that apply to job-made ladders**~~((?))~~. ~~((A--))~~ **Job-made ladder**~~((is))~~. A ladder that ~~((you or your))~~ the employer or 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.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-061 ~~((What))~~ **Requirements that 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.

Reference: For requirements relating to confined spaces, see WAC 296-307-642 through 296-307-656.

(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

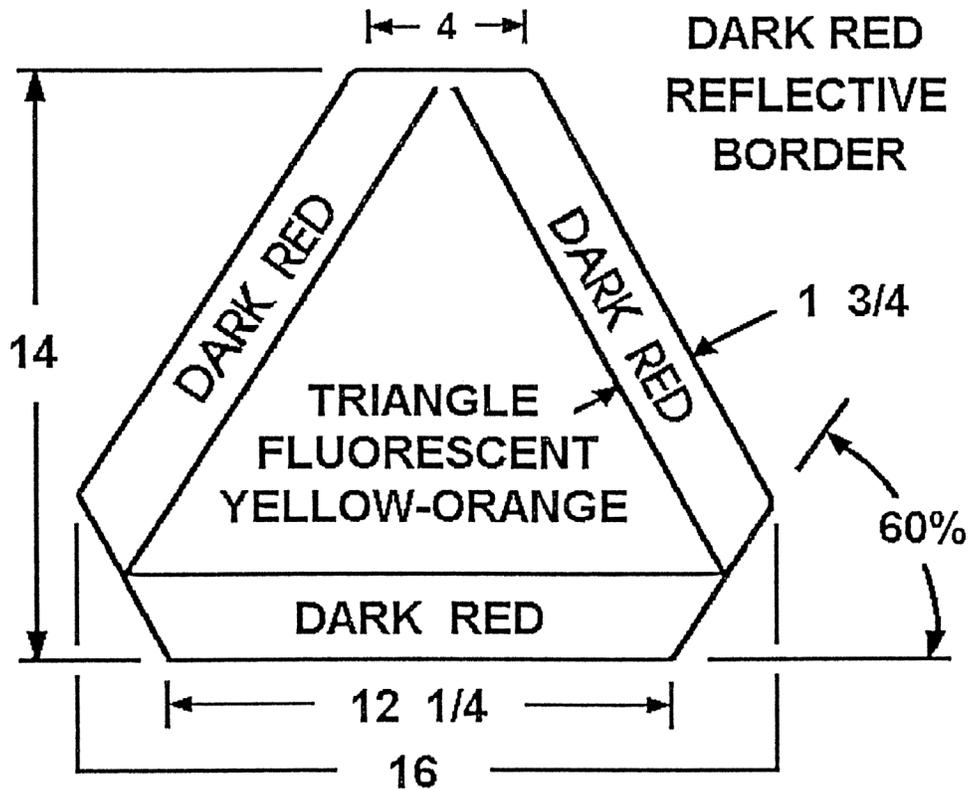
employees, and has authority to take prompt action to eliminate the hazards.

(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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-065 ~~((How must))~~ **Identification of slow-moving vehicles** ~~((be marked?))~~. (1) ~~((You))~~ The employer 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).



AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-07001 ((How must)) Motor vehicle((s be maintained?)) maintenance. (1) ((You)) The employer must maintain all motor vehicles and their parts in good repair and safe condition.

(2) ((You)) The employer must not use tires that are worn beyond the point of safety.

(3) Employees must report to ((you)) the employer any motor vehicle or other farm equipment that is in unsafe operating condition. ((You)) The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-07003 ((How must)) Motor vehicle((s be operated?)) operation. (1) Vehicles must be driven at safe operating speed.

(2) Truck drivers must operate equipment at a safe speed for roadway conditions.

(3) When an employee backing a truck has obstructed vision, the employee must be assisted by a signaler. The sig-

nalener 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-07005 ((Who may)) Qualifications to operate motor vehicle((s?)). Only qualified drivers may operate motor vehicles and must have a current motor vehicle operator's license.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-07007 ((What)) Requirements that apply to motor vehicle brakes((?)). (1) ((You)) The employer 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)) The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-07009 (~~(How must motor vehicles be loaded and unloaded?)~~) **Loading and unloading motor vehicles.** (1) ~~(You)~~ The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-07011 (~~(What)~~) **Required safety equipment** (~~(must)~~) **for 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.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-07013 (~~(What)~~) **Rules that apply to vehicles used to transport employees** (~~(?)~~). ~~(You)~~ The employer 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.

(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 296-307-03920, two blankets, and a fire extinguisher.

Note: Additional requirements relating to first aid are located in WAC 296-307-039.

(13) Heating units with open fires are not used in vehicles transporting crews.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-073 (~~(What)~~) **Requirements that apply to changing and charging, and storage of batteries** (~~(?)~~). (1) Battery changing installations must be located in areas designated for that purpose.

(2) Facilities must be provided for:

(*) (a) Flushing and neutralizing spilled electrolyte;

(*) (b) Fire protection;

(*) (c) Protecting charging apparatus from damage by trucks; and

(*) (d) 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)~~ The employer must ensure that vent caps function. The battery (or compartment) cover(s) must be open for cooling.

(10) Precautions ~~(shall)~~ must 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-076 (~~(How must)~~) **Guarding farm field equipment** (~~(be guarded?)~~), ⁽⁼⁾ **Farm field equipment** (~~(means)~~), Tractors or 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)~~) The employer 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(~~(-~~

~~(-)~~);

(a) Snapping or husking rolls;

(~~(*)~~) (b) Straw spreaders and choppers;

(~~(*)~~) (c) Cutterbars;

(~~(*)~~) (d) Flail rotors;

(~~(*)~~) (e) Rotary beaters;

(~~(*)~~) (f) Mixing augers;

(~~(*)~~) (g) Feed rolls;

(~~(*)~~) (h) Conveying augers;

(~~(*)~~) (i) Rotary tillers; and

(~~(*)~~) (j) 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)~~) the employer 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)~~) The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-08003 (~~(Which)~~) **Agricultural tractors** (~~(are)~~) **covered by this section** (~~(?)~~), ⁽⁼⁾ **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.

(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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-08006 (~~(What)~~) **Definitions that 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:

(~~(*)~~) (a) The front wheel spacing is equal to the rear wheel spacing, as measured between the centerlines of the wheels;

(~~(*)~~) (b) The clearance from the bottom of the tractor chassis to the ground is eighteen inches or less;

(~~(*)~~) (c) The highest point of the hood is sixty inches or less(~~(?)~~); and

(~~(*)~~) (d) The tractor is designed so that the operator straddles the transmission when seated.

AMENDATORY SECTION (Amending WSR 02-12-098, filed 6/5/02, effective 8/1/02)

WAC 296-307-08009 (~~(What)~~) **Requirements that apply to the testing and performance of ROPS used on agricultural tractors** (~~(?)~~), (~~(You)~~) The employer 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 1928.51 C.F.R. 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-08012 (~~What~~) **Requirements that apply to seatbelts used with ROPS on agricultural tractors**(~~?~~). (1) Where ROPS are required by WAC 296-307-080, (~~you~~) the employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-08015 (~~When are~~) **ROPS** (~~not required on~~) **requirements that apply to 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-08018 (~~What~~) **Required employee training** (~~requirements~~) **that apply to ROPS used on agricultural tractors**(~~?~~). (1) (~~You~~) The employer must

ensure that every employee who operates an agricultural tractor is informed of the operating practices listed below and of any other practices dictated by the work environment. (~~You~~) The employer must provide the information at the time of initial assignment and at least annually thereafter.

EXHIBIT A

EMPLOYEE OPERATING INSTRUCTIONS

1. Securely fasten (~~your~~) the 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~~) must 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~~) The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-08021 (~~What other~~) **Requirements that apply to ROPS used on agricultural tractors**(~~?~~). (1) (~~You~~) The employer 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~~) The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-085 (~~When must~~) Requirements for ROPS to 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~~) The employer 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 C.F.R., Protective Frames for Wheel Type Agricultural Tractors-Test Procedures and Performance Requirements, 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-090 (~~What~~) Requirements that 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~~) The employer must ensure that rider-operated

equipment is equipped with an overhead and rear canopy guard meeting the following requirements:

(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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-09503 (~~What does this section cover?~~) Scope. 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 (~~you~~) 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.

AMENDATORY SECTION (Amending WSR 12-24-071, filed 12/4/12, effective 1/4/13)

WAC 296-307-09506 (~~What~~) Definitions that apply to this section(~~?~~). (~~is~~) Accessible(~~means~~), A maximum of one-quarter mile or five minutes travel time from the worksite.

(~~is~~) 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).

(~~is~~) Handwashing facility(~~means~~), A facility that meets the requirements of WAC 296-307-09515 and is approved by the local health authority.

(~~is~~) Potable water(~~means~~), Water that is suitable for drinking by the public and meets the requirements of chapter 246-290 or 246-291 WAC.

(~~is~~) 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-09509 (~~(What orientation must employers provide for)~~) **Required field sanitation(?) training.** ((You)) The employer 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.

AMENDATORY SECTION (Amending WSR 09-07-098, filed 3/18/09, effective 5/1/09)

WAC 296-307-09512 (~~(What)~~) **The employer must provide potable water sources** (~~(must an employer provide?)~~). ((You)) The employer 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. Additional requirements may be found in the outdoor heat exposure standard in Part G-1, WAC 296-307-09740 Drinking water, which applies between May 1st and September 30th of each year.

- (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 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 C.F.R. Part 141 and 40 C.F.R. 147.2400.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-09515 (~~(What)~~) **Handwashing facilities** (~~(must an employer provide?)~~). ((You)) The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-09518 (~~(What)~~) **Toilet facilities** (~~(must an employer provide?)~~). ((You)) The employer 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)) The employer 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 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.

AMENDATORY SECTION (Amending WSR 09-07-098, filed 3/18/09, effective 5/1/09)

WAC 296-307-09710 Scope and purpose. (1) WAC 296-307-097 through 296-307-09760 applies to all employers with employees performing work in an outdoor environment.

(2) The requirements of WAC 296-307-097 through 296-307-09760 apply to outdoor work environments from May 1 through September 30, annually, only when employees are exposed to outdoor heat at or above an applicable temperature listed in Table 1.

Table 1

To determine which temperature applies to each worksite, select the temperature associated with the general type of clothing or personal protective equipment (PPE) each employee is required to wear.

Outdoor Temperature Action Levels

All other clothing	89°
Double-layer woven clothes including coveralls, jackets and sweatshirts	77°
Nonbreathing clothes including vapor barrier clothing or PPE such as chemical resistant suits	52°

Note: There is no requirement to maintain temperature records. The temperatures in Table 1 were developed based on Washington state data and are not applicable to other states.

(3) WAC 296-307-097 through 296-307-09760 does not apply to incidental exposure which exists when an employee is not required to perform a work activity outdoors for more than fifteen minutes in any sixty-minute period. This exception may be applied every hour during the work shift.

(4) WAC 296-307-097 through 296-307-09760 supplement all industry-specific standards with related requirements. Where the requirements under these sections provide more specific or greater protection than the industry-specific standards, the employer ~~((shall))~~ **must** comply with the requirements under these sections. Additional related

requirements are found in chapter 296-305 WAC, Safety standards for firefighters and chapter 296-307 WAC, Safety standards for agriculture.

AMENDATORY SECTION (Amending WSR 09-07-098, filed 3/18/09, effective 5/1/09)

WAC 296-307-09720 Definitions. ~~((+))~~ **Acclimatization** ~~((means))~~. The body's temporary adaptation to work in heat that occurs as a person is exposed to it over time.

~~((2))~~ **Double-layer woven clothing** ~~((means))~~. Clothing worn in two layers allowing air to reach the skin. For example, coveralls worn on top of regular work clothes.

~~((3))~~ **Drinking water** ~~((means))~~. Potable water that is suitable to drink. Drinking water packaged as a consumer product and electrolyte-replenishing beverages (i.e., sports drinks) that do not contain caffeine are acceptable.

~~((4))~~ **Engineering controls** ~~((means))~~. The use of devices to reduce exposure and aid cooling (i.e., air conditioning).

~~((5))~~ **Environmental factors for heat-related illness** ~~((means))~~. Working conditions that increase susceptibility for heat-related illness such as air temperature, relative humidity, radiant heat from the sun and other sources, conductive heat sources such as the ground, air movement, workload (i.e., heavy, medium, or low) and duration, and personal protective equipment worn by employees. Measurement of environmental factors is not required by WAC 296-307-097.

~~((6))~~ **Heat-related illness** ~~((means))~~. A medical condition resulting from the body's inability to cope with a particular heat load, and includes, but is not limited to, heat cramps, heat rash, heat exhaustion, fainting, and heat stroke.

~~((7))~~ **Outdoor environment** ~~((means))~~. An environment where work activities are conducted outside. Work environments such as inside vehicle cabs, sheds, and tents or other structures may be considered an outdoor environment if the environmental factors affecting temperature are not managed by engineering controls. Construction activity is considered to be work in an indoor environment when performed inside a structure after the outside walls and roof are erected.

~~((8))~~ **Vapor barrier clothing** ~~((means))~~. Clothing that significantly inhibits or completely prevents sweat produced by the body from evaporating into the outside air. Such clothing includes encapsulating suits, various forms of chemical resistant suits used for PPE, and other forms of nonbreathing clothing.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-10005 ((Who must provide)) Personal protective equipment((?)). (1) ~~((You))~~ **The employer** 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))~~ **the employer** must ensure that employees use protective clothing; respiratory devices; shields; barriers; and adequate protective equipment for eyes, face, head, and extremities.

(2) ~~((You))~~ **The employer** must provide personal protective equipment at no cost to employees, including replace-

ment due to normal wear and tear. The equipment must be maintained in sanitary and reliable condition.

Exception: ~~((You))~~ The employer 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))~~ the employer must ensure that the equipment is adequate, properly maintained, and sanitary.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-10010 ~~((What))~~ Requirements that apply to eye protection(?), ~~((You))~~ The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-10015 ~~((How must))~~ Requirements for personal protective equipment ~~((be used?))~~, (1) ~~((You))~~ The employer must ensure that employees use personal protective equipment according to the manufacturer's instructions.

(2) ~~((You))~~ The employer 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))~~ the employer of any defects in personal protective equipment or when the equipment becomes contaminated.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-10020 ~~((What must an employer do to prevent))~~ Preventing heat-related ~~((illness?))~~ illnesses, ~~((You))~~ The employer must take appropriate measures to prevent heat-related illness that may be caused by employees wearing any required personal protective equipment.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-10025 ~~((What instruction on))~~ Training for personal protective equipment ~~((must an employer give to employees?))~~, ~~((You))~~ The employer 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.

AMENDATORY SECTION (Amending WSR 04-13-129, filed 6/22/04, effective 8/1/04)

WAC 296-307-14505 ~~((What records must an employer keep))~~ Recordkeeping for pesticide applications(?), (1) If ~~((you apply))~~ the employer applies pesticides, or ~~((have))~~ has pesticides applied ~~((for you))~~, related to the production of an agricultural crop, ~~((you))~~ the employer 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))~~ the employer applies 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))~~ The employer must update records on the same day that a pesticide is applied. ~~((You))~~ The employer may use a copy as the record of the pesticide application. ~~((You))~~ The employer must maintain the records for at least seven years after the date of the application.

(4) ~~((You))~~ The employer 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))~~ The employee may view the pesticide application records and make ~~((you))~~ their 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))~~ the employer 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))~~ The employer must maintain a record of pesticide purchases made between the annual inventory dates.

(a) Instead of this purchase record, ~~((you))~~ the employer may obtain from distributors from whom ~~((you buy))~~ pesticides are purchased, a statement obligating the distributor to maintain the purchase records on ~~((your))~~ the employer's behalf to meet the requirements of this section.

(b) ~~((We))~~ The department may require ~~((you))~~ the employer to submit all purchase records covering the purchases during a specified period of time or in a specified geographical area.

(9) When ~~((you))~~ the employer ends all pesticide activities, ~~((you))~~ the employer must file the records with ~~((us))~~ the department. Anyone who succeeds or replaces ~~((you))~~ the employer must retain the records required by this section, but that person is not liable for any violations ~~((you))~~ the employer commits.

(10) ~~((You))~~ The employer must ensure that the records required under this section are readily accessible to ~~((us))~~ the department of labor and industries for inspection. ~~((You))~~ The employer 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))~~ The department of labor and industries 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))~~ the employer 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))~~ the employer must provide copies of the records within seventy-two hours.

(14) If requested, ~~((you))~~ the employer must provide copies of records on a form provided by the department.

(15) If ~~((you))~~ the employer suspects that an employee is ill or injured because of an exposure to one or more pesticides, ~~((you))~~ the employer must immediately provide the

employee with a copy of the relevant pesticide application records.

(16) If ~~((you))~~ the employer refuses to provide a copy of a requested record, the ~~((requester))~~ requestor may notify the department of the request and ~~((your))~~ the employer's refusal.

(a) Within seven working days, ~~((we))~~ the department of labor and industries will request that ~~((you))~~ the employer provide ~~((us))~~ the department with all pertinent copies of the records, except that in a medical emergency ~~((we))~~ the department will request within two working days.

(b) ~~((You))~~ The employer must provide copies of the records to ~~((us))~~ the department within twenty-four hours after we request.

(17) ~~((We))~~ The department of labor and industries will 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))~~ The department 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))~~ the employer's 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))~~ the department may conduct reasonable multiple inspections, according to department rules. Nothing in this section limits ~~((our))~~ the department's inspection of records pertaining to pesticide-related injuries, illnesses, fatalities, accidents, or complaints.

(18) If ~~((you))~~ the employer fails to maintain the records, or provide access to or copies of the records required under this section, ~~((you))~~ the employer 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. Pesticide application record forms can be found in chapter 16-228 WAC, General pesticide rules.

AMENDATORY SECTION (Amending WSR 03-24-105, filed 12/3/03, effective 2/1/04)

WAC 296-307-148 Scope and summary.

~~((Your))~~ Employer responsibility:

To implement a monitoring program for ~~((your))~~ employees who, as part of their job duties, **handle** category I or II organophosphate or N-methyl-carbamate pesticides with the words "DANGER" or "WARNING" on the label.

Definition:

~~((The terms))~~ **Handle** and **handler** ~~((refer to))~~, Employees who are engaged in the job duties listed in the definition of "handler" contained in WAC 296-307-11005, Pesticides (worker protection standard).

IMPORTANT:

Whenever there is reason to believe that an employee has been poisoned or injured by exposure to pesticides while on the job, ~~((you need))~~ the employer needs to provide the medical services required by WAC 296-307-13055.

~~((You must:~~

Maintain handling records for covered pesticides
WAC 296-307-14805.

- Implement a medical monitoring program
WAC 296-307-14810.
- Identify a physician or licensed health care professional
WAC 296-307-14815.
- Make cholinesterase testing available
WAC 296-307-14820.
- Respond to depressed cholinesterase levels
WAC 296-307-14825.
- Provide medical removal protection benefits
WAC 296-307-14830.
- Maintain records
WAC 296-307-14835.
- Provide training
WAC 296-307-14840.
- Implementation plan
WAC 296-307-14845.))

The employer must meet the requirements...	in this section:
Maintain handling records for covered pesticides	WAC 296-307-14805
Implement a medical monitoring program	WAC 296-307-14810
Identify a physician or licensed health care professional	WAC 296-307-14815
Make cholinesterase testing available	WAC 296-307-14820
Respond to depressed cholinesterase levels	WAC 296-307-14825
Provide medical removal protection benefits	WAC 296-307-14830
Maintain records	WAC 296-307-14835
Provide training	WAC 296-307-14840
Implementation plan	WAC 296-307-14845

AMENDATORY SECTION (Amending WSR 06-01-074, filed 12/20/05, effective 2/1/06)

WAC 296-307-14805 Maintain handling records for covered pesticides.

~~((You must:))~~

~~*) (1) The employer must maintain accurate records of all time that each employee spends handling category I or II organophosphate or N-methyl-carbamate pesticides (this includes employees who do not meet the handling hour thresholds in WAC 296-307-14810).~~

~~((*) (2) The employer must provide a completed CHOLINESTERASE MONITORING HANDLING HOURS REPORT (F413-065-000) to the physician or other licensed health care professional (LHCP) for each employee receiving a periodic cholinesterase blood test and make sure the report is submitted to the laboratory with each periodic cholinesterase test.~~

~~((*) (3) The employer must provide the employee with a copy of the CHOLINESTERASE MONITORING HANDLING HOURS REPORT upon request.~~

~~((*) (4) The employer must retain pesticide handling records for seven years.~~

~~((*) (5) The employer must make sure that pesticide-handling records are readily accessible to employees, their designated representatives, and treating health care professionals.~~

AMENDATORY SECTION (Amending WSR 06-01-074, filed 12/20/05, effective 2/1/06)

WAC 296-307-14810 Implement a medical monitoring program.

~~((You must:))~~

~~*) The employer must implement a medical monitoring program for ((your)) their employees who handle or will be expected to handle category I or II organophosphate or N-methyl-carbamate pesticides for thirty or more hours in any consecutive thirty-day period.~~

- Notes:
- ~~((You do)) 1. The employer does not need to count time spent mixing and loading using closed systems (as defined in WAC 296-307-13045 (4)(d)) in determining the need for periodic testing. Closed cabs are not "closed systems." Time using closed systems is still counted for purposes of establishing coverage under this rule and determining the need for obtaining baseline cholinesterase levels.~~
 - ~~((*) 2. The first thirty consecutive day period begins on the first day of handling organophosphate or N-methyl-carbamate pesticides after obtaining the baseline cholinesterase test.~~
 - ~~((*) 3. There is nothing in this rule that prohibits employers from providing cholinesterase monitoring to employees who handle organophosphate or N-methyl-carbamate pesticides for fewer than thirty hours in any consecutive thirty-day period.~~

AMENDATORY SECTION (Amending WSR 06-01-074, filed 12/20/05, effective 2/1/06)

WAC 296-307-14815 Identify a physician or other licensed health care professional.

~~((You must:))~~

~~*) (1) The employer must identify a physician or other licensed health care professional (LHCP) who will:~~

~~((-) (a) Provide baseline and periodic cholinesterase testing through the department of health public health laboratory or a laboratory approved by the department of labor and industries.~~

~~((-) (b) Interpret cholinesterase tests.~~

~~((-) (c) Provide ((you)) the employer with a written recommendation for each employee's blood test and evaluation.~~

~~((*) (2) The employer must obtain the LHCP's written recommendation for each employee's blood test and evaluation (including baseline tests) and make sure that the employee receives a copy of the LHCP's written recommendation, either through ((you)) the employer or directly through the LHCP, within five business days after ((you)) the employer receives the recommendation.~~

~~((*) (3) The employer must make sure the LHCP's written recommendation for each employee's blood test and evaluation is limited to the following information:~~

~~((-) (a) The employee's cholinesterase status based on the LHCP's evaluation.~~

((-) (b) Identification of changes in cholinesterase levels requiring a work practice evaluation for the employee.

((-) (c) Identification of changes in cholinesterase levels requiring the employee to be removed from handling and other exposure to organophosphate and N-methyl-carbamate pesticides.

((-) (d) Guidance on medical monitoring.

((-) (e) Any other relevant information concerning an employee's workplace exposure to organophosphate and N-methyl-carbamate pesticides.

Note: All testing for an employee should be conducted through the same laboratory. This will allow for accurate comparison between baseline and periodic tests.

~~((You must:~~

•) (4) The employer must instruct the LHCP to **NOT** reveal in writing or in any other communication with ~~((you))~~ the employer any other personally identifiable medical information.

Note: If the LHCP written recommendation contains specific findings or diagnoses unrelated to occupational exposure, ~~((you))~~ the employer should send it back and obtain a revised version without the additional information.

~~((You must:~~

•) (5) The employer must make sure the LHCP is familiar with the requirements of this rule (for example, by providing a copy of the rule or by confirming that the provider has attended training on the rule).

(•) (6) The employer must post the name, address, and telephone number of the LHCP ~~((you have))~~ the employer has identified at the locations where employees usually start their work day.

(•) (7) The employer must make sure written recommendations from the LHCP are maintained for seven years.

Note: ~~((You))~~ The employer may only obtain the employee's actual test results if the employee provides the LHCP with written consent to share these results with ~~((you))~~ the employer.

AMENDATORY SECTION (Amending WSR 06-01-074, filed 12/20/05, effective 2/1/06)

WAC 296-307-14820 Make cholinesterase testing available.

~~((You must:~~

•) (1) The employer must make medical monitoring available to employees who will meet the handling hour threshold of thirty or more hours in any consecutive thirty-day period (WAC 296-307-14810) at no cost and at a reasonable time and place, as follows:

((-) (a) Provide annual baseline red blood cell (RBC) and serum cholinesterase tests that are taken at least thirty days after the employee last handled organophosphate or N-methyl-carbamate pesticides.

((-) (b) Provide periodic RBC and serum cholinesterase testing:

((■) (i) Within three days after the end of each thirty-day period where the employee meets the handling hour threshold in WAC 296-307-14810; however, testing is not required more often than every thirty days;

OR

((■) (ii) At least every thirty days for those employees who may meet the handling hour threshold in WAC 296-307-14810.

((-) (c) Follow the recommendations of the LHCP regarding continued employee pesticide handling or removal from handling until a thirty-day exposure free baseline can be established.

Exemption: ~~((You do))~~ The employer does not need to provide baseline or periodic testing for those employees whose work exposure is limited to handling only N-methyl-carbamate pesticides.

Notes: ((*) 1. For employees who have had exposure to organophosphate or N-methyl-carbamate pesticides in the thirty days prior to the test obtain a working baseline. For example, a worker who initially declines cholinesterase testing and later chooses to participate in testing would obtain a "working baseline."
((*) 2. For new employees, the LHCP may accept previous baselines, if they are obtained according to this rule.

~~((You must:~~

•) (2) The employer must obtain a signed declination statement from the LHCP for each employee who declines cholinesterase testing.

((-) (a) Employees may decline cholinesterase testing only after they receive training about cholinesterase inhibiting pesticides and discuss the risks and benefits of participation with the LHCP.

((-) (b) An employee may change his or her mind and elect to participate or decline to continue participation in the testing program at any time.

(•) (3) The employer must make sure the employee receives a copy of the signed declination statement, either through ~~((you))~~ the employer or directly through the LHCP, within five business days after ~~((you))~~ the employer receives the declination statement.

Note: If employers discourage participation in cholinesterase monitoring, or in any way interfere with an employee's decision to continue with this program, this interference may represent unlawful discrimination under RCW 49.17.160, Discrimination against employee filing, instituting proceedings, or testifying prohibited—Procedure—Remedy.

AMENDATORY SECTION (Amending WSR 06-01-074, filed 12/20/05, effective 2/1/06)

WAC 296-307-14825 Respond to depressed cholinesterase levels.

~~((You must:~~

•) The employer must respond to an employee's depressed cholinesterase levels by:

((-) (1) Taking the actions required in Table 1;

AND

((-) (2) Following any additional occupational health recommendations from the LHCP.

Table 1
Required Responses to an Employee's Depressed Cholinesterase Levels

When:	Action to be taken:	Methods:
An employee's RBC or serum cholinesterase levels fall more than twenty percent below the baseline	Evaluate the employee's work-place and work practices to identify and correct potential sources of pesticide exposure	Review:
		<ul style="list-style-type: none"> Personal protective equipment (PPE) and its condition
		<ul style="list-style-type: none"> Employees' PPE usage
		<ul style="list-style-type: none"> General sanitation and decontamination practices and availability of decontamination facilities required by WAC 296-307-13050
An employee's RBC cholinesterase level falls thirty percent or more from the baseline OR An employee's serum cholinesterase level falls forty percent or more from the baseline	Remove the employee from handling and other work exposures to organophosphate and N-methyl-carbamate pesticides such as thinning and harvesting in recently treated areas AND Evaluate the employee's work practices to identify and correct potential sources of pesticide exposure	<ul style="list-style-type: none"> When available, provide the employee with other duties that do not include handling and other work exposures to organophosphate and N-methyl-carbamate pesticides
		<ul style="list-style-type: none"> Provide medical monitoring and cholinesterase testing as recommended by the LHCP
A removed employee's cholinesterase levels return to twenty percent or less below baseline	The employee may return to handling class I and II organophosphate and N-methyl-carbamate pesticides	Continue periodic cholinesterase monitoring

AMENDATORY SECTION (Amending WSR 06-01-074, filed 12/20/05, effective 2/1/06)

WAC 296-307-14830 Provide medical removal protection benefits.

~~((You must:~~

•)) (1) The employer must provide medical removal protection benefits for a maximum of three months on each occasion:

((-) (a) An employee is temporarily removed from work due to depressed cholinesterase levels;

OR

((-) (b) Assigned to other duties due to depressed cholinesterase levels.

((*) (2) The employer must provide medical removal protection benefits that include maintenance of the same pay, seniority and other employment rights and benefits of an employee as though the employee had not been removed from normal exposure to organophosphate or N-methyl-carbamate pesticides or otherwise limited.

Note: The following are examples of how a worker's pay could be maintained while medically removed from exposure to cholinesterase-inhibiting pesticides:

((*) 1. A removed worker is assigned to work eight hours a day but the employer's pesticide handlers are working ten hours a day. The removed worker would be paid for ten hours at the handler's pay rate.

((*) 2. The farmer pays workers two dollars more per hour when they are handling organophosphate or N-methyl-carbamate pesticides. The removed worker will be paid this premium when the pesticides are being handled on the farm; however, the worker will be paid at their usual pay rate when the pesticides are not being handled on the farm.

AMENDATORY SECTION (Amending WSR 03-24-105, filed 12/3/03, effective 2/1/04)

WAC 296-307-14835 Maintain records.

~~((You must:~~

•)) (1) The employer must make sure that the following records are maintained:

((-) (a) The name, address, and telephone number of the physician or LHCP.

((-) (b) Written recommendations and opinions received from the physician or LHCP.

((-) (c) Findings of all work practice investigations.

((-) (d) Dates when employees were medically removed from their duties and dates when employees are returned to duties that include handling organophosphate or N-methyl-carbamate pesticides.

((-) (e) Signed declination statements.

((*) (2) The employer must maintain records for seven years.

((*) (3) The employer must make sure that all records are readily accessible to the employee and his or her designated representative.

AMENDATORY SECTION (Amending WSR 03-24-105, filed 12/3/03, effective 2/1/04)

WAC 296-307-14840 Provide training.

~~((You must:~~

•)) The employer must make sure employees have received training before initial medical monitoring. The training must include at least the following:

((-) (1) The human health hazards and physical symptoms of overexposure to organophosphate and N-methyl-carbamate cholinesterase-inhibiting pesticides.

((-) (2) The purpose and requirements for medical monitoring.

Note: Training required by this rule may be combined with other pesticide handler training as required by WAC 296-307-13025, Pesticide safety training—Standards for pesticide handlers.

AMENDATORY SECTION (Amending WSR 03-24-105, filed 12/3/03, effective 2/1/04)

WAC 296-307-14845 Implementation plan. The department will implement and complete an evaluation of this rule by doing the following:

((*) (1) Organize a scientific team to oversee collection and analysis of data collected during 2004 and 2005. L&I will select representatives of the University of Washington, Washington State University, as well as other interested members of the academic and scientific communities, to participate on the team. The team will provide an initial analysis of testing data and any appropriate recommendations directly to L&I and to the cholinesterase monitoring advisory committee by November 1, 2004, and a further analysis and any appropriate recommendations by November 1, 2005. A final report and recommendations will be completed by September 30, 2006.

((*) (2) Establish a cholinesterase stakeholder advisory committee to evaluate issues related to rule implementation and provide recommendations to the department regarding implementation of the rule and any possible modifications to it. L&I will invite representatives of growers, labor and other affected state agencies to participate on the advisory committee. The committee will have an opportunity to comment on the analysis completed by the scientific team and to make any appropriate recommendations before December 1, 2004, and again before December 1, 2005. In addition, the committee will review the scientific committee's final report and recommendations and provide advice to L&I prior to December 1, 2006.

((*) (3) Review reports from the scientific team and stakeholder advisory committee, and other relevant information and make modifications to the rule as appropriate.

((*) (4) Make efforts to defray the costs of medical testing during 2004.

((*) (5) Prepare and distribute provider guidelines.

((*) (6) Develop and make available a model employee training program.

((*) (7) Publish a list of trained providers and certified laboratories on the internet.

((*) (8) Coordinate recordkeeping requirements with the department of agriculture.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-15003 ((What does this section cover?)) Scope. 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 asso-

ciated equipment) of rail transportation systems, or electrical generating, transmission, distribution, and communication systems.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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)) The employer 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)) The employer is 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-15009 ((What) Signs ((must)) an employer must post to warn employees working near overhead lines((?)). ((You)) The employer 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."

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-15012 (~~(When must an)~~) **The employer must notify the utility ((of)) when employees are 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.

Part L

Temporary Worker Housing (TWH)

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

WAC 296-307-16101 Purpose and applicability. (1) Purpose. This part is adopted by the Washington state department of labor and industries to implement the provisions of chapter 49.17 RCW and establish minimum health and safety requirements for temporary worker housing and cherry harvest camps.

(2) Applicability. This part applies to:

(a) Temporary worker housing, including cherry harvest camps, provided by agricultural employers or operators in the state of Washington; and

(b) Operators of temporary worker housing (~~(shall)~~) **must** be licensed under this chapter if the housing meets the criteria identified in WAC 296-307-161.

For licensing requirements, see WAC 246-358-025, Licensure. For self-survey requirements, see WAC 246-358-027, Requirements for self-survey program. For enforcement requirements, see WAC 246-358-028, Enforcement.

Note: The requirements in this part only apply to residents of the TWH facility who are also employees of the TWH facility owner. Requirements that would apply to other TWH residents, such as family members, who are not employees of the TWH facility owner, are in chapter 246-358 WAC, Temporary worker housing.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

WAC 296-307-16103 Definitions. The following definitions apply throughout this chapter unless the context clearly indicates otherwise:

Agricultural employee. Any person who renders personal services to, or under the direction of, an agricultural employer in connection with the employer's agricultural activity.

Agricultural employer. 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.

Bathing facility. An enclosed area provided by the operator for workers to bathe or shower, and may be located within a family shelter or a common facility.

Building. Any structure used or intended by the operator to be used by workers for cooking, eating, sleeping, sanitation, or other facilities.

Cherry harvest camp. A place where housing and related facilities are provided to agricultural employees by agricultural employers or TWH operators for their use while employed for the harvest of cherries in the state of Washington. Cherry harvest camps are the only TWH site allowing tents.

Common. A shared facility provided by the operator for all workers of the TWH.

Common areas. Housing areas shared or used by one or more families or unrelated individuals.

Current certificate (first aid). A first-aid training certificate that has not expired.

Dining hall. A cafeteria-type eating place with food furnished by and prepared under the direction of the operator for consumption, with or without charge, by workers.

Drinking fountain. A fixture equal to a nationally recognized standard or a designed-to-drain faucet, which provides potable drinking water under pressure. A "drinking fountain" does not mean a bubble-type water dispenser.

Dwelling unit. A shelter, building, or portion of a building, which may include cooking and eating facilities, that are:

(a) Provided and designated by the operator as either a sleeping area, living area, or both, for occupants; and

(b) Physically separated from other sleeping and common areas. "Physically separated" means a physical wall separating rooms.

Family shelter. A dwelling unit with sleeping facilities for up to fifteen workers that may include toilet or cooking facilities. If services such as bathing, food-handling, or toilet facilities are provided in the family shelter, they are for the sole use of the occupants of the family shelter.

First-aid trained. The person holds a current certificate of first-aid training.

Floor space. The area within a dwelling unit with a minimum ceiling height of seven feet.

Food-handling facility. An enclosed area provided by the operator for workers to prepare their own food, and may be within a family shelter or common facility.

Group A public water system. A public water system as defined and referenced under WAC 246-290-020.

Group B public water system. A public water system that is not a Group A public water system, and is defined and referenced under WAC 246-291-050.

Habitable room. A room or space in a structure used for living, sleeping, eating, or cooking. Bathing facilities, toilet

facilities, closets, halls, storage or utility space, and similar areas are not considered habitable rooms.

Health officer. The individual appointed as such for a local health department under chapter 70.05 RCW or appointed as the director of public health of a combined city-county health department under chapter 70.08 RCW.

Livestock. Horses, cows, pigs, sheep, goats, poultry, etc.

Livestock operation. Any place, establishment, or facility consisting of pens or other enclosures in which livestock is kept for purposes including, but not limited to, feeding, milking, slaughter, watering, weighing, sorting, receiving, and shipping. Livestock operations include, among other things, dairy farms, corrals, slaughterhouses, feedlots, and stockyards. Operations where livestock can roam on a pasture over a distance may be treated as outside the definition.

MSPA. The Migrant and Seasonal Agricultural Worker Protection Act (96 Stat. 2583; 29 U.S.C. Sec. 1801 et seq.).

Occupant. A temporary employee or a person who resides with a temporary worker at the TWH or camp.

Operating license or license. A document issued annually by the department of health.

Operator. A person holding legal title to the land on which the TWH or camp is located. However, if the legal title and the right to possession are in different persons, "operator" means a person having the lawful control or supervision over the TWH.

Recreational park trailers. A trailer-type unit that is primarily designed to provide temporary living quarters for recreational, camping, or seasonal use, that meets the following criteria:

- (a) Built on a single chassis, mounted on wheels;
- (b) Having a gross trailer area not exceeding 400 square feet (37.15 square meters) in the set-up mode;
- (c) Certified by the manufacturer as complying with ANSI A119.5; and
- (d) Chapter 296-150P WAC.

Recreational vehicle. A vehicular-type unit that is compliant with chapter 296-150R WAC and primarily designed as temporary living quarters for recreational camping, travel, or seasonal use that either has its own motive of 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, but does not include pickup trucks with camper shells, canopies, or other similar coverings.

Refuse. Solid wastes, rubbish, or garbage.

Temporary worker or worker. An agricultural employee employed intermittently and not residing year-round at the same TWH site.

TWH, temporary worker housing or housing. A place, area, or piece of land where sleeping places or housing sites are provided by an agricultural employer for agricultural employees or by another person, including a temporary worker housing operator, who is providing such accommodations for employees for temporary, seasonal occupancy. TWH includes cherry harvest camps.

Tent. An enclosure or shelter constructed of fabric or pliable material composed of rigid framework to support tensioned membrane that provides the weather barrier.

WISHA. The Washington Industrial Safety and Health Act, chapter 49.17 RCW, administered by the Washington state department of labor and industries.

Worker-supplied housing. Housing owned by the worker and made available to the same worker on the operator's TWH site. Worker-supplied housing includes recreational park trailers, recreational vehicles, tents, or other structures that meet the requirements of this chapter.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

WAC 296-307-16104 Technical assistance—Notice of violation. (1) The department of health or the department of labor and industries may provide technical assistance to assist in compliance with this chapter if requested by an operator.

(2) The department of labor and industries will only provide technical assistance to cherry harvest camps if requested by an operator.

(3) During a consultative technical assistance visit, or within a reasonable time thereafter, the department (~~shall~~) must inform the owner or operator of the TWH on any violations of law or agency rules as follows:

- (a) A description of the condition that is not in compliance and the text of the specific section or subsection of the applicable law or rule;
- (b) A statement of what is required to achieve compliance;
- (c) The date by which the agency requires compliance to be achieved;
- (d) Notice of the means to contact any technical assistance services provided by the agency or others; and
- (e) Notice of when, where, and to whom a request to extend the time to achieve compliance for good cause may be filed with the agency.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

WAC 296-307-16120 Variance and procedure. (1) Conditions may exist in operations that a state standard will not have practical use. The director of the department of labor and industries may issue a variance from the requirements of the standard when another means of providing equal protection is provided. The substitute means must provide equal protection in accordance with the requirements of chapter 49.17 RCW and chapter 296-900 WAC, Administrative rules.

(2) A temporary variance may be requested under chapter 296-900 WAC, Administrative rules, when an operator cannot comply with new requirements by the effective date(s) of this chapter because:

- (a) The construction or alteration to a building cannot be completed in time;
 - (b) Materials or equipment are not available; or
 - (c) Professional or technical assistance is not available.
- (3) Applications for variances will be reviewed and may be investigated by the department of labor and industries and the department of health. Variances granted will be limited to the specific case or cases covered in the application and may

be revoked for cause. The variance must remain prominently posted on the premises while in effect.

(4) Variance application forms may be obtained from the Department of Labor and Industries, P.O. Box 44650, Olympia, Washington 98504-4650 or the Department of Health, P.O. Box 47852, Olympia, Washington 98504-7852, upon request. Requests for variances from safety and health standards (~~shall~~) must be made in writing to the director or the assistant director, Department of Labor and Industries, P.O. Box 44650, Olympia, Washington 98504-4650. (Reference RCW 49.17.080 and 49.17.090.)

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

WAC 296-307-16125 Temporary worker housing sites and cherry harvest campsites. (~~The operator must:~~)

(1) The operator must locate and operate a TWH site to prevent a health or safety hazard that is:

(a) Adequately drained and any drainage from and through the TWH must not endanger any domestic or public water supply;

(b) Free from periodic flooding and depressions in which water may become a nuisance;

(c) At least two hundred feet from a swamp, pool, sink hole, or other surface collection of water unless there is a mosquito prevention program for those areas;

(d) Large enough to prevent overcrowding of necessary structures. The principal housing area for sleeping and for food preparation and eating must be at least five hundred feet from where livestock are kept; and

(e) The grounds and open areas surrounding the shelters must be in a clean and sanitary condition.

(2) The operator must ensure the principal TWH area for sleeping and for food preparation and eating are at least five hundred feet from where livestock are kept or congregate.

(3) The operator must ensure the TWH grounds and open areas surrounding the buildings are kept in a clean and sanitary condition free from refuse.

(4) The operator must ensure all worker-supplied housing is maintained in good working condition.

(5) The operator must restrict the number of occupants in the TWH to the capacity as determined by the department of health.

(6) When closing housing permanently or for the season:

(a) The operator must dispose of all refuse to prevent nuisance; and

(b) The operator must leave the grounds and buildings in a clean and sanitary condition.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

WAC 296-307-16130 Water supply. (~~The operator must:~~)

(1) The operator must provide a safe and reliable supply of drinking water from an approved Group A or Group B public water system meeting the requirements of:

(a) WAC 246-358-025 (2)(d), chapters 246-290 and 246-291 WAC; or

(b) Local board of health rules.

(2) The operator must ensure that the distribution lines are able to maintain the working pressure of the water piping system at not less than twenty pounds per square inch after allowing for friction and other pressure losses.

(3) When water is not piped to each dwelling unit, the operator must provide cold, potable, running water under pressure within one hundred feet of each dwelling unit.

(4) When water sources are not available in each individual dwelling unit or tent, the operator must provide one or more drinking fountains for each one hundred occupants or fraction thereof. The use of common drinking cups or containers from which water is dipped or poured is prohibited.

(5) The operator must provide an adequate supply of hot and cold running water under pressure in bathing, food-handling, and laundry facilities.

(6) The operator must provide an automatically controlled hot water supply of one hundred to one hundred twenty degrees Fahrenheit in bathing, food-handling, and laundry facilities.

(7) When water within one hundred feet of a dwelling unit is unsafe for drinking purposes and accessible to workers, the operator must post a sign by each nonpotable water source that:

(a) Reads "Do not drink. Do not use for washing. Do not use for preparing food.";

(b) Is printed in English and in the native language of the workers;

(c) Is printed on material colored to indicate unsafe; and

(d) Is marked with easily understood pictures or symbols.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

WAC 296-307-16135 Sewage disposal. (~~The operator must:~~)

(1) The operator must provide sewage disposal systems in accordance with local health jurisdictions.

(2) The operator must connect all drain, waste, and vent systems from buildings to:

(a) Public sewers, if available; or

(b) Approved on-site sewage disposal systems that are designed, constructed, and maintained as required in chapters 246-272A and 173-240 WAC, and local ordinances.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 1/1/16)

WAC 296-307-16140 Electricity and lighting. (~~The operator must ensure that:~~)

(1) The operator must ensure that electricity is supplied to all dwelling units, family shelters, and common facilities, except chemical toilets;

(2) The operator must ensure that all electrical wiring, fixtures, and electrical equipment must:

(a) Comply with the electric standards of the department of labor and industries regulations, chapters 19.28 RCW, 296-46B WAC, and local ordinances; and

(b) Be maintained in a safe condition.

(3) The operator must ensure that each habitable room must have at least:

- (a) One ceiling-type light fixture; and
- (b) At least one separate floor-type or wall-type convenience outlet.
- (4) The operator must ensure that laundry, toilet facilities, and bathing facilities have at least one ceiling-type or wall-type light fixture;
- (5) The operator must ensure that general lighting and task lighting within all facilities is adequate to carry on normal daily activities;
- (6) The operator must ensure that adequate lighting is provided for safe passage for workers to handwashing sinks and toilets. Lighting requirements may be met by natural or artificial means;
- (7) For lighting requirements in tents, please see WAC 296-307-16147.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 1/1/16)

WAC 296-307-16145 Building requirements and maintenance. ((An operator must:))

- (1) An operator must construct, if provided TWH dwelling units, including common facilities, which must meet the following requirements:
 - (a) Protect against the elements;
 - (b) The State Building Code, chapter 19.27 RCW, or TWH construction standard, chapter 246-359 WAC; and
 - (c) State and local ordinances, codes, and regulations.
- (2) An operator must prevent condensation in dwelling units and common facilities to the degree that it does not contribute to a health risk or safety issue to occupants.
- (3) An operator must prevent mold in dwelling units and common facilities.
- (4) An operator must provide a locking mechanism on the exterior door(s) of each family shelter. The mechanism must not prevent egress and must be easily opened from the inside without use of a key or special knowledge.
- (5) An operator must provide a locking mechanism on all bedroom doors, excluding doors to bedrooms housing more than fifteen occupants. The mechanism must not prevent egress and must be easily opened from the inside without use of a key or special knowledge.
- (6) An operator must provide a locking mechanism on:
 - (a) Each toilet stall door, if provided; and
 - (b) Each shower stall door, if provided.
- (7) An operator must identify each dwelling unit and space used for shelter by posting a number at each site.
- (8) An operator must maintain buildings in good repair and sanitary condition.
- (9) An operator must comply with all applicable state and federal laws and rules for lead based paint. For more information on lead, go to ((<http://www.lni.wa.gov/Safety/Topics/AtoZ/Lead/Default.asp>)) <http://www.lni.wa.gov/Safety/Topics/AtoZ/Lead>.
- (10) An operator must provide exits that are unobstructed and remain free of any material or matter where its presence would obstruct or render the exit hazardous.
- (11) An operator must provide habitable rooms with:
 - (a) Windows covering a total area equal to at least one-tenth of the total floor space; and

- (b) At least one-half of each window can be opened to the outside for ventilation; or
- (c) Mechanical ventilation in accordance with applicable standards from the American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE).
- (12) An operator must provide each room used for sleeping purposes with:
 - (a) At least fifty square feet of floor space for each worker, not including any floor space in any portion of a room less than seven feet from the finished floor to the finished ceiling; and
 - (b) Windows covering a total area equal to at least one-tenth of the floor space within the surrounding walls of the sleep room.
- (13) An operator must provide each room used for sleeping and cooking purposes:
 - (a) Meet the requirements of subsection (12) of this section;
 - (b) At least one hundred square feet of floor space per temporary worker; and
 - (c) For a family shelter constructed or approved for construction under chapter 246-359 WAC before January 1, 2016, one hundred square feet of floor space per temporary worker is required by January 1, 2019. Upon the operator's request, the department of health may grant an extension(s) for up to three additional years. Requests must:
 - (i) Include a schedule and work plan for achieving compliance;
 - (ii) Be on a form provided by the department of health; and
 - (iii) Be submitted to the department of health prior to January 1, 2019.
- (14) An operator must ensure wooden floors are at least one foot above ground level or meet the requirements in the State Building Code, chapter 19.27 RCW or Temporary worker housing construction standard, chapter 246-359 WAC.
- (15) An operator must provide sixteen-mesh screening on all exterior openings and screen doors with self-closing devices.
- (16) An operator must provide and maintain screen doors on all exterior entrances that:
 - (a) Have self-closing devices; and
 - (b) Close without gaps that would allow entry of pests.
- (17) An operator must install all heating, cooking, and water heating equipment according to state and local ordinances, codes, and regulations and maintain in a safe condition.
- (18) An operator must provide habitable rooms with equipment capable of maintaining a temperature of at least seventy degrees Fahrenheit during cold weather.
- (19) An operator must ensure that all recreational vehicles and park trailers meet the requirements as defined in this chapter.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 1/1/16)

- WAC 296-307-16147 Tents.** (1) Each tent must be constructed to sleep no more than fifteen workers.

(2) Tents must provide protection from the elements, insects, and animals.

(3) Structural stability and floors.

(a) Tents and their supporting framework must be adequately braced and anchored to prevent weather related collapse. Documentation of the structural stability must be furnished to the department of health.

(b) Floors must be smooth, sloped from a raised center towards the lower outer edges. Floors must be without breaks or holes to provide a hard, stable walking surface. Nonridged flooring supported by grass, dirt, soil, gravel, or other uneven surfaces is not acceptable. Floors that are constructed of wood or concrete must comply with the building code, chapter 19.27 RCW and this chapter.

(c) Floor systems must be designed to prevent the entrance of snakes, rodents, and other nuisances.

(4) Flame-retardant treatments.

(a) The sidewalls, drops, and tops of tents (~~((shall))~~) must be composed of flame-resistant material or treated with a flame-retardant in an approved manner.

(b) Floor coverings, which are integral to the tent, and the bunting, (~~((shall))~~) must be composed of flame-resistant material or treated with a flame retardant in an approved manner and in accordance with Uniform Building Code, Standard 31.1.

(c) All tents must have a permanently affixed label bearing the following information:

(i) Identification of tent size and fabric or material type;

(ii) For flame-resistant materials, the necessary information to determine compliance with this section and National Fire Protection Association Standard 701, Standard Methods of Fire Tests for Flame-resistant Textiles and Films;

(iii) For flame-retardant materials, the date that the tent was last treated with an approved flame-retardant;

(iv) The trade name and type of flame-retardant used in the flame-retardant treatment; and

(v) The name of the person and firm that applied the flame-retardant.

(5) Means of egress.

(a) Tents must have a primary entrance door. At least one door must lead to the outside of the tent. The door must not be obstructed in any manner and must remain free of any material or matter where its presence would obstruct or render the exit hazardous.

(b) The area designated for refuge must be accessible and remain clear of storage materials or hazards.

(c) If food-handling facilities are provided in tents, or the tent occupancy capacity is for ten or more workers, a window must be located opposite the door and must have a means to open the window or provide an easily opened space, for example, a zipper which opens downward to the floor, must be provided.

(6) Floor area. (~~((The operator must:))~~)

(a) If food-handling facilities are provided in the tent, the operator must provide an additional twenty square feet of floor space;

(b) The operator must provide at least fifty square feet of floor space for each worker in rooms used for sleeping purposes.

(7) Ceiling height.

(a) A ceiling height of at least seven feet is required in fifty percent of the total floor area.

(b) No portion of the tent measuring less than six feet from the flooring to the ceiling will be included in any computation of the floor area.

(8) Windows and ventilation.

(a) Provide a window area equal to one-tenth of the total floor area in each habitable room which opens at least half-way or more directly to the outside for cross-ventilation and has a minimum of sixteen-mesh screens on all exterior openings.

(b) The windows must have weather-resistant flaps, which will cover the window area and a means of fastening the flaps to provide protection from the elements and allow privacy for the workers.

(9) Electrical and lighting. (~~((The operator must ensure that:))~~)

(a) The operator must ensure that electricity is supplied to all tents used as habitable room.

(b) The operator must ensure that all electrical wiring, fixtures and electrical equipment must comply with the electrical standards of the department of labor and industries regulations, chapter 19.28 RCW, and local ordinances, and be maintained in a safe condition.

(c) The operator must ensure that each tent used as a habitable room has at least one ceiling-type light fixture and at least one separate floor-type or wall-type convenience outlet.

(d) If cooking is provided in the tent, the operator must ensure that appropriate wiring and electrical equipment is provided.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

WAC 296-307-16150 Laundry facilities. (~~((An operator must:))~~)

(1) An operator must provide laundry facilities that include:

(a) One laundry tray or tub or one mechanical washing machine for every thirty occupants;

(b) Adequate facilities for drying clothes; and

(c) Sloped, coved floors of nonslip impervious materials with screened floor drains.

(2) An operator must maintain laundry facilities in a clean and sanitary condition.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 1/1/16)

WAC 296-307-16155 Handwashing and bathing facilities. (~~((An operator must:))~~)

(1) An operator must provide handwashing and bathing facilities adequate for the maximum capacity of the TWH according to Table 1 of WAC 296-307-16115.

(2) An operator must meet the following general requirements for all handwashing and bathing facilities:

(a) Provide cleanable, nonabsorbent waste containers;

(b) Provide all showers, baths, or shower rooms with screened floor drains to remove waste water;

(c) Maintain fixtures and drains in good working order;

(d) Separate showers with partitions or walls.

(i) Partitions and walls must ensure privacy and be smooth, cleanable, and nonabsorbent.

(ii) For a bathing facility constructed or approved for construction under chapter 246-359 WAC before January 1, 2016, partitions or walls are required by January 1, 2017.

(e) All showers separated by partitions must ensure privacy.

(3) An operator must meet the following requirements for common facilities:

(a) One handwash sink for every six occupants. Of these handwash sinks, locate adjacent to toilets at least one handwash sink for every fifteen occupants;

(b) One showerhead for every ten occupants;

(c) One "service sink" in each building used for common laundry, handwashing, or bathing;

(d) Sloped, coved floors of nonslip impervious materials with floor drains;

(e) Shower and bathing facilities must provide privacy from the opposite sex and the public;

(f) Maintain common bathing and handwashing facilities in a clean and sanitary condition, cleaned at least daily; and

(g) Bathing and shower facilities must be available at all times during operation of the TWH.

(4) An operator must meet the following requirements for family shelters:

(a) At least one handwash sink per family shelter. If an operator provides a family shelter with toilet facilities, at least one handwash sink located in the toilet room or immediately adjacent to the toilet room; and

(b) Request occupants in family shelters to maintain bathing and handwashing facilities in a clean and sanitary condition.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 1/1/16)

WAC 296-307-16160 Toilet facilities. (~~The operator must:~~)

(1) The operator must provide toilet facilities adequate for the maximum capacity of the TWH according to Table 1 of WAC 296-307-16115.

(2) The operator must not provide or allow the use of pit privies.

(3) The operator must fill abandoned pit privies with earth.

(4) The operator must meet the following general requirements for all toilet facilities:

(a) Provide flush toilets unless chemical toilets are specifically approved by the department of health according to requirements in chapter 246-272 WAC;

(b) Flush toilets, chemical toilets, and urinals must not be located in any sleeping room, dining room, cooking or food-handling facility or in any tent;

(c) Toilet rooms must be provided with:

(i) Handwashing sinks located in or immediately adjacent to the toilet room;

(ii) Either a window of at least six square feet opening directly to the outside or adequate ventilation;

(iii) Sixteen-mesh screens on all outside openings;

(iv) Fixtures maintained in good working order, including toilet(s) and sink(s); and

(v) Drains maintained in good working order, including floor drains with screens.

(d) When chemical toilets are approved, they must be:

(i) Located at least fifty feet from any dwelling unit or food-handling facility;

(ii) Maintained by a licensed waste disposal company;

(iii) Comply with local ordinances; and

(iv) Located immediately adjacent to a handwash sink(s); and

(e) When urinals are provided:

(i) There must be one urinal or two linear feet of urinal trough for each twenty-five men;

(ii) The floors and the walls surrounding a urinal and extending out at least fifteen inches on all sides must be constructed of materials which will not be adversely affected by moisture; and

(iii) The urinal must have an adequate water flush.

(5) The operator must meet the following requirements for common toilet facilities:

(a) Where common toilet facilities are provided, the number of toilets for each sex must be based on the maximum number of occupants of that sex which the camp is designed to house at any one time, in the ratio of one such toilet for every fifteen occupants, with a minimum of two toilets according to Table 1 of WAC 296-307-16115;

(b) Locate toilet rooms so that:

(i) Toilets are within two hundred feet of the door of each sleeping room; and

(ii) No person has to pass through a sleeping room to reach a toilet room.

(c) Maintain toilets in a clean and sanitary condition, cleaned at least daily;

(d) Provide each toilet compartment with an adequate supply of toilet paper at all times;

(e) Separate toilets by partitions or walls. For the purposes of this section, partitions do not include curtains.

(i) Partitions and walls must ensure privacy, and must have smooth, cleanable, and nonabsorbent surfaces;

(ii) For a common toilet facility constructed or approved for construction under chapter 246-359 WAC before January 1, 2016, partitions or walls are required by January 1, 2017.

(f) Ensure the area surrounding common toilet facilities are adequately lighted; and

(g) When common facilities will be used for both men and women:

(i) Provide separate toilet rooms for each sex with a minimum of one toilet room for each sex and meet the required ratio as defined in (a) of this subsection;

(ii) Identify each room for "men" and "women" with signs printed in English and in the native language of the persons occupying the camp, or identified with easily understood pictures or symbols; and

(iii) Separate facilities by solid walls or partitions extending from the floor to the roof or ceiling when facilities for each sex are located in the same building.

(6) The operator must meet the following requirements for family shelters if common toilet facilities are not provided:

- (a) One toilet for each individual family shelter;
- (b) Ensure toilet facilities are cleaned prior to occupancy; and
- (c) Request occupants to maintain the facilities in a clean and sanitary condition.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 1/1/16)

WAC 296-307-16165 Cooking and food-handling facilities. ~~((The operator must:))~~

- (1) The operator must provide sanitary facilities for storing and preparing food;
- (2) ~~((Provided))~~ The operator must provide all food-handling facilities with:
 - (a) Covered and enclosed or screened cooking and food-handling facilities for all occupants;
 - (b) Covered and enclosed or screened eating facilities with adequate tables and seating for the occupants;
 - (c) If provided, hotplates that meet WAC 296-307-16140 (2);
 - (d) A sink with hot and cold running potable water under pressure;
 - (e) At least two cubic feet of dry food storage space per occupant;
 - (f) Nonabsorbent, and easily cleanable food preparation surfaces situated off the floor;
 - (g) Mechanical refrigeration conveniently located and able to maintain a temperature of forty degrees Fahrenheit or below, with at least two cubic feet of storage space per occupant;
 - (h) Fire-resistant, nonabsorbent, nonasbestos, and easily cleanable wall coverings adjacent to cooking areas;
 - (i) Nonabsorbent, easily cleanable floors;
 - (j) Adequate ventilation for cooking facilities; and
 - (k) Cooking facilities, including fixtures and drains, maintained in good working order.
- (3) In common food-handling facilities, the operator must provide:
 - (a) A room, building, or space within a building adequate in size, separate from any sleeping quarters or tent for workers to prepare and cook their own food;
 - (b) No direct openings to living or sleeping areas from the common food-handling facility;
 - (c) An operable cook stove or electric hotplate with four cooking surfaces for every ten workers through any combination of cooking surfaces including burners, one foot in length of burner surface, microwave ovens, stove ovens, or convection ovens.
 - (4) In family shelter food-handling facilities, the operator ~~((shall))~~ must provide an operable cook stove or electric hotplate with four cooking surfaces for every ten workers through any combination of cooking surfaces including burners, one foot in length of burner surface, microwave ovens, stove ovens, or convection ovens.

- (5) The operator must ensure that common dining hall facilities comply with chapter 246-215 WAC, Food service.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 1/1/16)

WAC 296-307-16170 Cots, beds, bedding, and personal storage. ~~((The operator must:))~~

- (1) The operator must provide beds, cots, or bunks in good condition for the maximum occupancy approved by the department of health for operator-supplied housing;
- (2) The operator must allow the use of cots in tents for cherry harvest camps only. Cots must be sturdy and stable and without:
 - (a) Visible mold;
 - (b) Rips or tears;
 - (c) Insect infestation;
 - (d) Stains from bodily fluids; and
 - (e) Rodents or rodent droppings.
- (3) In TWH other than cherry harvest camps, the operator must provide beds and bunks with clean mattresses in good repair and without:
 - (a) Mold;
 - (b) Rips or tears;
 - (c) Insect infestation;
 - (d) Stains from bodily fluids; or
 - (e) Rodents or rodent droppings.
- (4) If provided by the operator, the operator must maintain bedding~~((, if provided by the operator,))~~ in a clean and sanitary condition;
- (5) The operator must locate all beds, cots, and bedding at least thirty-six inches from cooking surfaces;
- (6) The operator must provide a minimum of twelve inches of clearance between each cot, bed or bunk and the floor;
- (7) The operator must allow space to separate beds or cots laterally and end-to-end by at least thirty-six inches when single beds or cots are used;
- (8) The operator must meet the following requirements when bunk beds are used:
 - (a) Allow space to separate beds laterally and end-to-end by at least forty-eight inches;
 - (b) Maintain a minimum space of twenty-seven inches between the upper and lower bunks; and
 - (c) Prohibit triple bunks.
- (9) The operator must provide all occupants suitable storage space for clothing and personal articles. Storage space must be located in the occupant's room used for sleeping;
- (10) Effective January 1, 2017, for each temporary worker housed in a common sleeping facility, the operator must provide suitable storage space that must:
 - (a) Ensure all or a portion of the storage space is enclosed and lockable;
 - (b) Be anchored in a manner which adequately prevents the storage space from being removed from the building; and
 - (c) Be accessible to the temporary worker.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

WAC 296-307-16175 First aid and safety. ~~((The operator must:))~~

(1) The operator must comply with chapters 15.58 and 17.21 RCW and chapters 16-228 and 296-307 WAC, Parts I and J, and pesticide label instructions when using pesticides in and around the TWH;

(2) The operator must prohibit, in the TWH area, the use, storage, or mixing of flammable, volatile, or toxic substances other than those intended for household use;

(3) The operator must provide readily accessible first-aid equipment;

(4) The operator must ensure that a first-aid trained person is readily accessible to administer first aid at all times;

(5) The operator must remove unused refrigerator units or other appliances to prevent access by children.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 1/1/16)

WAC 296-307-16180 Refuse (waste) disposal. (~~The operator must:~~)

(1) The operator must comply with local sanitation codes for removing and disposing of refuse from TWH areas;

(2) The operator must protect against rodent harborage, insect breeding, and other health hazards while storing, collecting, transporting, and disposing of refuse;

(3) The operator must store refuse in fly-tight, rodent-tight, impervious, and cleanable or reusable containers or in single-use containers;

(4) The operator must keep refuse containers clean;

(5) The operator must provide at least one reusable container for each dwelling unit that is:

(a) Located within one hundred feet of each dwelling unit;

(b) Placed on a solid, flat, and level stand made of wood, metal, or concrete; and

(c) Secured to prevent falling over or spilling.

(6) The operator must empty refuse containers at least twice each week, and when full.

AMENDATORY SECTION (Amending WSR 15-13-092, filed 6/15/15, effective 7/16/15)

WAC 296-307-16190 Disease prevention and control. (~~The operator must:~~)

(1) The operator 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) The operator must report immediately to the local health officer:

(a) Suspected food poisoning;

(b) An unusual prevalence of fever, diarrhea, sore throat, vomiting, or jaundice;

(c) Productive cough; or

(d) When weight loss is a prominent symptom among workers.

(3) The operator must prohibit any individual with a communicable disease from preparing, cooking, serving, or handling food, foodstuffs, or materials in dining halls.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-18005 (~~How must~~) Guarding fan blades (~~be guarded?~~). (~~You~~) The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-18010 (~~How must~~) Guarding constant-running drives (~~be guarded?~~). Constant-running drives. Drives that continue to rotate when the engine is running and all clutches are disengaged.

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.~~)

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-18015 (~~What~~) Training (~~must~~) an employer must provide for employees who use agricultural equipment(~~?~~). At the time of initial assignment and at least annually thereafter, (~~you~~) the employer 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.

(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~~) the employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-18025 ((How-must)) Steam pipe((s-be guarded?)) guarding. (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 safe-guard, 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-18503 ((What-general-requirements apply-to)) Powered saws((?)). (1) ((You)) The employer must ensure that all 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)) The employer must provide and ensure that employees use push sticks or push blocks in sizes and types suitable for the work to be done.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-18506 ((How-must)) Guarding band saws ((be-guarded?)). (1) ((You)) The employer 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)) The employer 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)) The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-18509 ((How-must)) Guarding radial arm saws ((be-guarded?)). (1) ((You)) The employer 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)) The employer may use an alternative lower blade guard if it provides equivalent protection.

(2) ((You)) The employer must provide an adjustable stop to prevent the forward travel of the blade beyond the position necessary to complete the cut.

(3) ((You)) The employer 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)) The employer may use a counterweight 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)) The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-18512 ((How-must)) Guarding table saws ((be-guarded?)). (1) ((You)) The employer must ensure that each circular blade table saw used for ripping or cross-cutting 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)) The employer 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)) The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-18515 ((How must)) Guarding circular fuel-wood saws ((be guarded?)). (1) ~~((You))~~ The employer 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))~~ The employer 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))~~ The employer 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))~~ The employer 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.

(6) When a circular fuel-wood saw blade develops a crack, ~~((you))~~ the employer 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"

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-19003 ((What)) Definitions that 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. "Rein-

forced" 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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:
- ~~((+))~~ 1. Wheels used for internal work while the wheel is within the work being ground.
 - ~~((+))~~ 2. Mounted wheels 2 inches and smaller in diameter, used in portable operations.
 - ~~((+))~~ 3. Types 16, 17, 18, 18R, and 19 cones, plugs, and threaded hole pot balls where the work offers protection.
 - ~~((+))~~ 4. 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:**
- ~~((+))~~ 1. 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.
 - ~~((+))~~ 2. 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.
 - ~~((+))~~ 3. 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:**
- ~~((+))~~ 1. Bench and floor stands~~((;))~~:
 - ~~((+))~~ a. 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.
 - ~~((+))~~ b. 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.
 - ~~((+))~~ 2. Swing-frame grinders may only be exposed on the bottom half; the top half of the wheel must be enclosed at all times.
 - ~~((+))~~ 3. Where the work is applied to the top of the wheel, the exposure of the grinding wheel periphery must not exceed 60°.
 - ~~((+))~~ 4. 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

(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~~) must 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-19015 (~~How must~~) Guarding 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-19018 (~~How must~~) Guarding 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

(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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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:

((*) (a) All hand-held powered circular saws with a blade diameter-greater than 2 inches;

((*) (b) Electric, hydraulic or pneumatic chain saws; and

((*) (c) 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:

((*) (a) All hand-held powered drills, tappers, fastener drivers, and horizontal, vertical, and angle grinders with wheels greater than 2 inches in diameter;

((*) (b) Disc sanders with discs greater than 2 inches in diameter;

((*) (c) Belt sanders;

((*) (d) Reciprocating saws;

((*) (e) Saber, scroll, and jig saws with blade shanks greater than a nominal 1/4 inch; and

((*) (f) 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:

((*) (a) All other hand-held powered tools, including:

((*) (b) Platen sanders;

((*) (c) Grinders with wheels 2 inches in diameter or less;

((*) (d) Disc sanders with discs 2 inches in diameter or less;

((*) (e) Routers;

((*) (f) Planers;

((*) (g) Laminate trimmers;

((*) (h) Nibblers;

((*) (i) Shears; and

((*) (j) Saber, scroll, and jig saws with blade shanks a nominal 1/4 inch wide or less.

((*) (i) 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.

((*) (ii) Blade shank width must be measured at the narrowest portion of the blade shank when saber, scroll, and jig saws have nonstandard blade holders.

((*) (iii) "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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-22003 (~~What~~) Definitions that apply to this section(?) (1) **Blade tip circle**(~~means~~) The path described by the outermost point of the blade as it rotates about its shaft axis.

(2) **Catcher assembly**(~~means~~) A part that provides a means for collecting grass clippings or debris.

(3) **Deadman control**(~~means~~) A control designed to automatically interrupt power to a drive when the operator releases the control.

(4) **Guard**(~~means~~) A part for shielding a hazardous area of a machine.

(5) **Lowest blade position**(~~means~~) The lowest blade position when the mower is not in use.

(6) **Operator area**(~~means~~) (walk-behind mowers) 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.

(7) **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.

(8) **Power rotary mower**(~~means~~) A lawn-cutting machine with a power source that rotates one or more cutting blades about a vertical axis.

(9) **Riding mower**(~~means~~) A powered, self-propelled lawn-cutting vehicle on which the operator rides and controls the machine.

(10) **Sulky type mower**(~~means~~) A walk-behind mower that has been converted to a riding mower by the addition of a sulky.

(11) **Walk-behind mower**(~~means~~) A mower either pushed or self-propelled and normally guided by the operator walking behind the unit.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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 shutoff 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.

(6) All power lawn mowers must be used according to the manufacturer's instructions.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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 swin-gover 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) ~~((Y00))~~ The employer 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 mower. Using rope or string or other material to tie the constant pressure device in the "on" position is prohibited.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-22503 (~~(What)~~) Definitions that apply to this section~~((?))~~. ~~((^(u)))~~ Jack~~((^(u) 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.

~~((^(u)))~~ Rating~~((^(u) means))~~. The maximum working load for which a jack is designed to lift the load safely throughout its travel.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-22506 (~~(How shall)~~) The rated load must 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: ~~((Y00))~~ The operator should follow the manufacturer's specifications to raise the rated load of a jack.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-22509 (~~(What rules apply to the)~~) Operation and maintenance of jacks~~((?))~~. (1) If the foundation is not firm, ~~((Y00))~~ the operator must block the base of the jack. If the cap might slip, ~~((Y00))~~ the operator 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) ~~((Y00))~~ The operator 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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))~~ The employer must provide clearance signs to warn of clearance limits.

(8) For powered industrial truck (forklift) requirements, see WAC 296-307-520.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-24001 ~~((Must an))~~ The employer must comply with state health regulations ~~((?))~~. ~~((You))~~ The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-24003 ~~((What does this section cover?))~~ Scope. 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-24006 ~~((What))~~ Definitions that 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 C.F.R., Part 141, and 40 C.F.R. 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.

~~((2))~~ **Wet process**~~((means))~~. Any process or operation in a workroom that normally results in walking or standing surfaces becoming wet.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-24009 ~~((What))~~ **Housekeeping requirements that apply to fixed, indoor workplaces**~~((?))~~. (1) ~~((You))~~ The employer must ensure that all places of employment are kept clean to the extent that the work allows.

(2) ~~((You))~~ The employer must ensure that the floor of every workroom is kept as dry as possible. Where wet processes are used, ~~((you))~~ the employer must maintain drainage. ~~((You))~~ The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-24012 ~~((How must the))~~ **Maintenance of potable water supply** ~~((be maintained?))~~. (1) ~~((You))~~ A common drinking cup and other common utensils are prohibited.

(2) The employer 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))~~ (3) Potable drinking water dispensers must be maintained in sanitary condition, be closeable, and have a tap.

~~((3))~~ (4) 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.~~

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-24015 ~~((How must the))~~ **Maintenance of nonpotable water supply** ~~((be maintained?))~~. (1) ~~((You))~~ The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-24018 ~~((What))~~ **Toilet facilities** ~~((must an employer provide?))~~. (1) ~~((You))~~ The employer must provide toilet facilities, with separate toilet rooms for each sex, according to the requirements in the table below. ~~((You))~~ The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-24021 ~~((What))~~ **Employer provided washing facilities** ~~((must an employer provide?))~~. ~~((You))~~ The employer must provide facilities for maintaining personal cleanliness in the workplace. The facilities must be

convenient for employees and maintained in a sanitary condition.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-24024 (~~What requirements apply to~~) **Lavatories**(~~(?)~~). (1) (~~You~~) The employer 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~~) The employer must provide hand soap or similar cleansing agent.

(4) (~~You~~) The employer must provide individual hand towels, warm air blowers, or clean individual sections of continuous cloth toweling convenient to the lavatories.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-24027 (~~When must an~~) **Employer** (~~provide~~) **provided 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~~) the employer must provide change rooms with separate storage facilities for street clothes and for the protective clothing.

(2) If (~~you~~) the employer provides work clothes for employees, they must be dry.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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~~) the workplace exposes employees to injurious dusts or other toxic materials, (~~you~~) the employer 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~~) The employer must provide receptacles of smooth, corrosion resistant, easily cleanable, or disposable materials for the disposal of waste food. (~~You~~) The employer 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.

tion. 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-24033 (~~How must waste be stored and removed?~~) **Waste storage and removal**. (1) (~~You~~) The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-24036 (~~When must an~~) **Employer** (~~have a~~) **vermin control programs**(~~(?)~~). 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~~) The employer must have a continuing and effective extermination program where vermin are present.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-28004 (~~What does~~) **Definition of 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-28006 (~~What~~) General requirements that apply to machine guarding(~~?~~), (1) All power transmission components must be guarded according to the requirements of this section.

(2) (~~You~~) The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-28014 (~~What~~) Requirements that 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~~) the employer 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~~) The employer 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 is used, keys or other projections left uncovered by the projections (~~shall~~) must be cut off or covered.

Note: This exception does not apply to flywheels with solid web centers.

(e) At the flywheel of a gas or oil engine, (~~you~~) the employer 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~~) the employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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 passageway.

(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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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)~~ the employer 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)~~ the employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-28020 (~~What requirements apply to~~) **Guarding horizontal belt, rope, and chain drives(?)**, ~~(a) Belts~~ (a) 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

~~(a) Nip-point belt and pulley guard~~ (a) 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

~~(a) Belt shifter~~ (a) 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.

(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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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)) The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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)) the employer must provide protection against falling parts.

Exception: This section does not apply to manually operated sprockets.

(4) When gears require frequent oiling, ((you)) the employer must provide openings with hinged or sliding self-

closing covers. All points not readily accessible must have oil feed tubes if lubricant is added while machinery is in motion.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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 oil-cups in any revolving pulley or part of machinery.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-28036 ((What requirements apply to))

Guarding collars and couplings((?)). (1) All revolving collars, including split collars, must be cylindrical.

(2) Screws or bolts used in collars must not project beyond the largest periphery of the collar.

((2)) (3) 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-28038 ((Must)) Self-lubricating bearings ((be used?)). ((We recommend that you)) The department recommends the employer use self-lubricating bearings. All drip cups and pans must be securely fastened.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-28040 ((What requirements apply to))
Guarding clutches, cutoff couplings, and clutch pul-

leys((?)), (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))~~ The employer may use a "U" type guard.

(2) In enginerooms, a guardrail, preferably with toe-board, may be used instead of the guard if the room is only occupied by engineroom attendants.

(3) A bearing support next to a friction clutch or cutoff coupling must have self-lubricating bearings that require infrequent maintenance.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-28044 ((What materials must be used for)) Materials required to use 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-28046 ((How must)) Manufacturing 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

(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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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)) The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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))~~ 6 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-28058 ((How-must)) Construction of 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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	7
	4-15	2	Metal No. 16 Wood 3/4 Metal No. 16	7
<i>Wood or metal strip not crossed</i>	Under 4	1/2 width	Wood 3/4	7
	4-15	1 width	Metal No. 16 Wood 3/4 Metal No. 16	7

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>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" x 1 1/2" x 1/4"	Angle iron
Filler (belt guards)	1 1/2" x 3/16"	Flat iron
Filler and vertical side member	No. 20 A.W.G.	Solid sheet metal
Filler supports	2" x 5/16" flat iron	Flat and angle
Guard supports	2" x 5/16"	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" x 3 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" x 2" x 5/16"	Angle iron
Filler (belt guards)	2" x 3/16"	Flat iron
Filler and vertical side member	No. 18 A.W.G.	Solid sheet metal
Filler supports	2" x 3/8" flat iron	Flat and angle
Guard supports	2" x 3/8"	Flat iron
FASTENINGS		
Filler supports to framework	(2) 3/6"	Rivets
Filler flats to supports (belt guards)	(1) 5/16"	Flush rivets

	Width 0"-14" inclusive	Material
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 overheard ceiling	5/8" x 4" 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
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MEMBERS

Framework	3" x 3" x 3/8"	Angle iron
Filler (belt guards)	2" x 5/16"	Flat iron
Filler and vertical side member	No. A.W.G.	Solid sheet metal
Filler supports	2 1/2" x 2 1/2" x 1/4" angle	Flat and angle
Guard supports	2 1/2" x 3/8"	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"

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-28062 ((How must)) Shafting ((be maintained?)) maintenance. (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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-28064 (~~(How must)~~) **Pulley**(~~(s be maintained?)~~) **maintenance.** (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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-28066 (~~(How must belts be maintained?)~~) **Belt maintenance.** (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)~~) The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-28068 (~~(How must)~~) **Maintenance for other equipment** (~~(be maintained?)~~). (1) (~~(You)~~) The employer must inspect all power-transmission equipment at least every sixty 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-29005 (~~(What)~~) **Requirements that 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)~~) The employer 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)~~) The employer 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)~~) The employer 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)~~) the employer must provide a positive restraint between the auger tube and the under-carriage lifting arm. (~~(You)~~) The employer 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)~~) The employer must provide the auger operator with service and operation instructions that include safe operation and servicing practices.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-29010 (~~(What)~~) **Other requirements that apply to auger conveying equipment manufactured after October 25, 1976**(~~(?)~~). (~~(You)~~) The employer 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 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-30003 (~~(What does this section cover?)~~) **Scope.** 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-30006 (~~(How-must)~~) **Guarding power takeoff shafts of farmstead equipment** (~~(be-guarded?)~~). (1) (~~(You)~~) The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-30009 (~~(How-must)~~) **Guarding 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-30012 (~~(How-must)~~) **Guarding 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:

- (*) (1) Snapping or husking rolls;
- (*) (2) Straw spreaders and choppers;
- (*) (3) Cutterbars;
- (*) (4) Flail rotors;
- (*) (5) Rotary beaters;
- (*) (6) Mixing augers;
- (*) (7) Feed rolls;
- (*) (8) Rotary tillers; and
- (*) (9) Similar units that must be exposed for proper function.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-30015 (~~(When-may)~~) **Removing 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)~~) the employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-30018 (~~(What)~~) **Requirements that apply to electrical control** used **for maintaining and servicing farmstead equipment**(~~(?)~~). (1) (~~(You)~~) The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-30021 (~~(What)~~) **Additional guarding requirements that apply to farmstead equipment**(~~(?)~~). (1) (~~(You)~~) The employer 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

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-32001 (~~What does this section cover?~~) **Scope.** (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

(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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-32003 (~~When does this section not apply?~~) **Operations not in scope.** (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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-32005 (~~What~~) **Definitions that 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.

(~~"~~) **Energy isolating device** (~~"~~ means). ~~A~~ mechanical device that physically prevents the transmission or release of energy, including but not limited to the following:

(~~*~~) (a) A manually operated electrical circuit breaker;

(~~*~~) (b) A disconnect switch;

(~~*~~) (c) A manually operated switch with conductors of circuit that can be disconnected from all ungrounded supply conductors and allows no pole to operate independently;

(~~*~~) (d) A line valve;

(~~*~~) (e) A block; and

(~~*~~) (f) 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.

(~~1~~) 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.

(~~2~~) 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.

(~~3~~) Normal production operations(~~means~~). Using a machine or equipment for its intended production function.

(~~4~~) 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.

(~~5~~) Setting up(~~means~~). Any work performed to prepare a machine or equipment to perform its normal production operation.

(~~6~~) 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.

(~~7~~) 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-32007 (~~What are the~~) Required elements of an energy control program(~~?~~). (~~You~~) The employer must establish a written energy control program consisting of:

- (~~1~~) (1) An energy control procedure;
- (~~2~~) (2) Employee training; and
- (~~3~~) (3) 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-32009 (~~How does an employer determine~~) Employer requirements for determining when to use lockout vs. tagout(~~?~~). (1) If an energy isolating device is not capable of being locked out, (~~you~~) the employer's energy control program must use a tagout system.

(2) If an energy isolating device is capable of being locked out, (~~you~~) the employer's 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-32011 (~~What~~) Requirements that must be met to substitute tagout for lockout(~~?~~). (1) (~~You~~) The employer 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~~) The employer 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~~) the employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-32013 (~~What are the~~) Required elements (~~of~~) for energy control procedures(~~?~~). (1) (~~You~~) The employer must develop, document, and use procedures to control potentially hazardous energy when employees are engaged in activities covered by this section.

- Exception:** (~~You are~~) The employer is 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-32015 ((What)) Requirements that apply to lockout and tagout devices and materials((?)), (1) ((You)) The employer 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.

(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."

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-32017 ((How often must)) Inspecting the energy control procedure ((be inspected?)), (1) ((You)) The employer 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)) The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-32019 ((What)) General requirements that apply to energy control program training and communication((?)), (1) ((You)) The employer 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 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-32021 (~~What~~) **Additional requirements that 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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))~~ the employer believes, 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-32025 (~~What~~) **Retention of training records** (~~((must an employer keep?))~~). ~~((You))~~ The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-32027 (~~Who may~~) **Qualifications to perform lockout or tagout**(~~(?)~~). Lockout or tagout must be performed only by authorized employees performing the service or maintenance.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-32029 (~~Who must be notified~~) **Notification 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-32031 (~~What~~) **Order of events** (~~((must))~~) **for 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-32033 ~~((What))~~ **Order of events** ~~((must))~~ **to 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))~~ the employer's direction, if specific procedures and training for such removal have been developed, documented, and incorporated into the energy control program.

~~((You))~~ The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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:

(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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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))~~ the employer and the outside employer must inform each other of ~~((your))~~ the employer's respective lockout or tagout procedures.

(2) The outside employer must ensure that employees understand and comply with the restrictions and prohibitions of ~~((your))~~ the employer's energy control program.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-32041 ~~((What requirements apply to))~~ **Lockout/tagout during shift changes** ~~((?))~~. During shift or personnel changes, ~~((you))~~ the employer must ensure that employees follow specific procedures to ensure the continuity of lockout or tagout 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-33001 ~~((What))~~ **Definitions that apply to this section** ~~((?))~~. ~~((("sign" means))~~ ~~((("sign" means))~~ **Accident prevention sign** ~~((("sign" means))~~ **(sign)**. 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.

(~~2~~) Accident prevention tag~~((~~"tag"~~) means)) (tag).~~ A card that identifies a hazardous condition, generally related to unsafe equipment.

(~~2~~) 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.

(~~2~~) Pictograph~~((~~"means"~~)).~~ A pictorial representation that identifies a specific hazardous condition or safety instruction.

(~~2~~) 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-33003 ((~~What does~~)) Use of 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-33005 ((~~What does~~)) Use of yellow ((~~identify~~)) in safety color coding~~((~~?~~)).~~ Use yellow to identify:

- (1) Caution signs and tags; and
- (2) Physical hazards.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-33007 ((~~When should signs and tags~~)) Use of "danger" versus "caution"~~((~~?~~)) on signs and tags.~~

(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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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~~))~~ The employer 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~~))~~ the employer 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~~))~~ The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-34003 (~~What does this section cover?~~) **Scope.** (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)~~ the employer does not intend for employees to use extinguishers, and ~~(your)~~ the employer's 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-34006 (~~Who is exempt?~~) **Exemption from the requirements of this section**(~~(?)~~). (1) ~~(You are)~~ The employer is exempt from all requirements of this section, if:

- (a) ~~(You have)~~ The employer has implemented a written fire safety policy that requires all employees to evacuate immediately when the fire alarm sounds; and
- (b) ~~(You have)~~ The employer has an emergency action plan and a fire prevention plan meeting the requirements of WAC 296-307-35015 and 296-307-35018; and
- (c) Extinguishers are not available for employee use in the workplace.

Note: If ~~(you are)~~ the employer is covered by one of the following sections requiring ~~(you)~~ the employer to provide a portable fire extinguisher, then ~~(you)~~ the employer may not apply this exemption:

- ~~(■)~~ 1. WAC 296-307-07013(12)—Transporting employees;
- ~~(■)~~ 2. WAC 296-307-34009(8)—Storage of flammables; or
- ~~(■)~~ 3. WAC 296-307-49503(2)—Welding.

(2) ~~(You are)~~ The employer is exempt from the distribution requirements in WAC 296-307-34012, if:

- (a) ~~(You have)~~ The employer has 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-34009 (~~What general requirements apply to?~~) **Portable fire extinguishers**(~~(?)~~). (1) ~~(You)~~ The employer must provide portable fire extinguishers that are readily accessible to employees without subjecting the employees to possible injury.

(2) ~~(You)~~ The employer 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)~~ The employer 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)~~ The employer 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)~~ The employer must post "no smoking" signs in areas where fire or explosion hazards exist. ~~(You)~~ The employer 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)~~ The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-34012 (~~How should?~~) **Selection and distribution of portable fire extinguishers** (~~be selected and distributed?~~). (1) ~~(You)~~ The employer 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)~~ The employer must distribute portable fire extinguishers so that no employee must travel more than 75 feet (22.9 m) to a fire extinguisher.

Exception: ~~(You)~~ The employer 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:

- ~~(*)~~ 1. The system meets all regulatory requirements governing total coverage of the area to be protected; and
- ~~(*)~~ 2. Employees are trained at least annually in their use.

(b) For Class B fires: ~~(You)~~ The employer 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))~~ The employer 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))~~ The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-34015 ~~((What are the requirements for))~~ **Inspection, maintenance and testing of portable fire extinguishers(?)**. (1) ~~((You are))~~ The employer is responsible for the inspection, maintenance, and testing of all portable fire extinguishers in the workplace.

(2) ~~((You))~~ The employer must visually inspect portable extinguishers or hose at least once a month.

(3) ~~((You))~~ The employer must ensure that portable fire extinguishers receive an annual maintenance check. ~~((You))~~ The employer must keep records of the maintenance dates for one year after the previous entry or the life of the shell, whichever comes first. ~~((You))~~ The employer must provide us with a copy of the record if we ask for it.

(4) ~~((You))~~ The employer 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))~~ The employer must ensure that alternate equivalent protection is provided when portable fire extinguishers are removed from service for maintenance and recharging.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-34018 ~~((What requirements apply to))~~ **Hydrostatic testing(?)**. (1) ~~((You))~~ The employer must ensure that a trained person performs hydrostatic testing with suitable testing equipment and facilities.

(2) ~~((You))~~ The employer 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

Type of Extinguishers	Test interval (years)
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))~~ the employer must ensure that the cylinders and shells are examined internally before the hydrostatic testing.

(4) ~~((You))~~ The employer must ensure that portable fire extinguishers are hydrostatically tested whenever they show new evidence of corrosion or mechanical injury.

(5) ~~((You))~~ The employer 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))~~ The employer must ensure that hose assemblies for carbon dioxide extinguishers that require a hydrostatic test are tested within a protective cage device.

(10) ~~((You))~~ The employer 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 C.F.R. 173.34(e)(15) may be hydrostatically tested every ten years.

(11) ~~((You))~~ The employer 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))~~ The employer 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))~~ The employer 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))~~ The employer must maintain records of the hydrostatic testing. ~~((Your))~~ Their records must include:

~~((•))~~ (a) The date of test;

~~((•))~~ (b) The test pressure used;

~~((•))~~ (c) The serial number, or other identifier of the fire extinguisher that was tested; and

~~((•))~~ (d) The person or agency performing the test.

~~((You))~~ The employer must keep the records until the next testing, or until the extinguisher is taken out of service, whichever comes first. ~~((Your))~~ The employer must provide us with copies of the records if we ask for them.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-34021 ~~((What are the))~~ Training requirements for portable fire extinguishers~~((?))~~. (1) If ~~((you))~~ the employer provides portable fire extinguishers for employee use, then ~~((you))~~ the employer 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))~~ The employer 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))~~ the employer must provide training in the use of the appropriate equipment.

~~((You))~~ The employer must provide the training upon initial assignment to the designated group of employees and at least annually thereafter.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-34503 ~~((What does this section cover?))~~ Scope. (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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-34506 ~~((What general requirements apply to))~~ Employee alarm systems~~((?))~~. (1) ~~((Your))~~ The employer's 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))~~ The employer must ensure that all employees can see or hear ~~((your))~~ their employee alarm above normal noise or light levels in the workplace. ~~((Your))~~ The employer may use tactile devices to alert employees who can not see or hear the alarm.

(3) ~~((You))~~ The employer must ensure that ~~((your))~~ their employee alarm is recognizable as an evacuation signal or signal to perform actions designated under the emergency action plan.

(4) ~~((You))~~ The employer must explain to each employee how to report emergencies. For example: They may use manual pull box alarms, public address systems, radio or telephones. ~~((Your))~~ The employer must post emergency telephone numbers near telephones, or employee notice boards when telephones serve as a means of reporting emergencies. When ~~((your))~~ the employer's communication system also serves as the employee alarm system, ~~((your))~~ the employer must ensure that all emergency messages have priority over all nonemergency messages.

(5) ~~((You))~~ The employer must establish procedures for sounding emergency alarms in the workplace. If ~~((you have))~~ the employer has 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))~~ the employer does not need a back-up system.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-34509 ~~((What are the))~~ Installation and restoration requirements for employee alarm systems~~((?))~~. (1) ~~((Your))~~ The employer 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))~~ the employer must ensure that all employee alarm systems are restored to normal operating condition as soon as possible. ~~((You))~~ The employer must ensure that ~~((you have))~~ spare alarm components are available in sufficient quantities and locations for prompt restoration of the system.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-34512 ~~((How must))~~ Employee alarm system~~((s be maintained and tested?))~~ maintenance and testing. (1) ~~((You))~~ The employer must ensure that all employee alarm systems are maintained in operating condition except when undergoing repairs or maintenance.

(2) ~~((You))~~ The employer must ensure that a test of the reliability and adequacy of nonsupervised employee alarm systems is made every two months. ~~((You))~~ The employer must use a different actuation device in each test of a multi-actuation device system so that no individual device is used for two consecutive tests.

(3) ~~((You))~~ The employer must maintain or replace power supplies as often as necessary to ensure fully operational condition. ~~((You))~~ The employer must provide back-up alarms, such as employee runners or telephones, when systems are out of service.

(4) ~~((You))~~ The employer 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))~~ The employer must ensure that all supervised employee alarm systems are tested at least annually for reliability and adequacy.

(5) ~~((You))~~ The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-34515 ~~((Where must))~~ Location(s) of manually operated devices~~((be located?))~~ ~~((You))~~ The employer must ensure that manually operated actuation devices used with employee alarms are easy to find and accessible.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-35003 ~~((What does this section cover?))~~ Scope. WAC 296-307-350 requires ~~((you))~~ the employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

~~((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.

AMENDATORY SECTION (Amending WSR 11-04-080, filed 2/1/11, effective 4/1/11)

WAC 296-307-35009 ~~((What are the))~~ Design requirements for exit routes~~((?))~~ ~~((You))~~ The employer 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) Make sure the exit route has a minimum ceiling height of 7 feet 6 inches and that no projection from the ceiling is less than 6 feet 8 inches from the floor.

(b) Objects that stick out into the exit route, such as fans hanging from the ceilings or cabinets on walls, must not reduce the minimum height of the exit route to less than 6 feet 8 inches from the floor.

(c) 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.

(d) 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-35012 ((What are the)) Operation and maintenance requirements for exit routes((?)). ((You))
The employer must ensure that each workplace meets the following requirements:

(1) The workplace exit route is maintained to minimize danger to employees during an emergency.

(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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-35015 (~~What are the requirements for an~~) **Emergency action plan**(~~(?)~~). (1) (~~You~~) The employer 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:

(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~~) The employer must designate employees to assist in the safe emergency evacuation of other employees. (~~You~~) The employer must ensure that the designated employees receive training in emergency evacuation procedures.

(4) (~~You~~) The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-35018 (~~What are the requirements for a~~) **Fire prevention plan**(~~(?)~~). (1) (~~You~~) The employer 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 ten 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~~) The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-36005 (~~What does this part cover?~~) **Scope.** (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:

(~~*~~) (~~a~~) Installations in watercraft, or automotive vehicles; or

(~~*~~) (~~b~~) 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36010 (~~What~~) **Definitions that 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~~) the employer keeps 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.

(~~U~~) Bonding jumper(~~(U means)~~). A reliable conductor that provides the correct electrical conductivity between metal parts that are required to be electrically connected.

(~~U~~) Branch circuits(~~(U 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.

(~~U~~) Certified(~~(U means)~~). Equipment that:

(*) (a) 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

(*) (b) Is a kind whose production is periodically inspected by a nationally recognized testing laboratory; and

(*) (c) Bears a label, tag, or other record of certification.

(~~U~~) Exposed(~~(U 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.

(~~U~~) Fixed equipment(~~(U means)~~). Equipment fastened or connected by permanent wiring methods.

(~~U~~) Ground(~~(U 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.

(~~U~~) Grounded(~~(U means)~~). Connected to earth or to some conducting body that serves in place of the earth.

(~~U~~) Isolated(~~(U means)~~). Equipment that is not readily accessible except through special means of access.

(~~U~~) Labeled(~~(U means)~~). Equipment that has an attached label, symbol, or other identifying mark of a nationally recognized testing laboratory that:

(*) (a) Makes periodic inspections of the production of such equipment; and

(*) (b) Whose labeling indicates compliance with nationally recognized standards or tests to determine safe use in a specified manner.

(~~U~~) Qualified person(~~(U 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.

(~~U~~) Shock hazard(~~(U)~~). 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.

(~~U~~) Weatherproof(~~(U 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 condi-

tions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36203 (~~(What)~~) The following electrical equipment must be approved(~~(?)~~). The conductors and equipment required or permitted by this section must be approved.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36206 (~~(How must)~~) Determining 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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))~~ authorized by the employer.

(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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36212 ((What)) Workspace that must be provided((?)) by the employer. (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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36221 ((How must)) Marking 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36224 ((How must)) Marking 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

Nominal voltage to ground	Working Clearances		
	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.

(~~(2)~~) Motor control center (~~"means"~~). An assembly of one or more enclosed sections having a common power bus and principally containing motor control units.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-36230 (~~What~~) Access and working space (~~must be provided~~) for electrical equipment over 600 volts, nominal (~~(2)~~). (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) (~~(Y04)~~) **The employer** 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.

(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)~~) **must** 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)~~) must 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
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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36403 ((How-must)) Installation and maintenance of 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36406 ((How-must)) Installation and maintenance of 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.

(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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36409 ((What-must)) Safety measures employees ((do)) must take when equipment causes electrical shock((?)). Employees must report all shocks received from electrical equipment, no matter how slight, immediately to ((you)) the employer. The equipment causing the shock must be checked and any necessary corrective action taken immediately.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36412 ((What)) Grounding and bonding requirements that 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~~) must 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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~~) the employer or to an authorized electrician.

(4) Attempting to start electric motors that kick out repeatedly is prohibited.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36421 (~~How must equipment be installed~~) Installing equipment 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 weather-proof.

(2) Switches, circuit breakers, and switchboards installed in wet locations must be enclosed in weatherproof enclosures.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36603 (~~How must~~) Use and identification of grounded and grounding conductors (~~be used and identified~~?). (1) A conductor used as a grounded conductor must be identified separately from all other conduc-

tors. 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36606 (~~What~~) Ampere rating (~~must~~) for outlet devices (~~have~~?). Outlet devices must have an ampere rating at least equal to the load served.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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:

(*) (i) 300 volts or less, 24 inches;

(*) (ii) More than 300 volts, 30 inches.

(c) For communication conductors below power conductors with power conductors of:

(*) (i) 300 volts or less, 24 inches;

(*) (ii) 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36612 ((What)) Design and protection requirements that apply to service-entrances((?)). (1) Disconnecting 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36618 ((What)) Grounding for 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.

Exception((s)): This requirement does not apply if:

((+)) 1. They supply only industrial equipment in limited areas and are equipped with a ground detector; or

((+)) 2. They are rectifier-derived from an AC system that meets the requirements of subsections (3), (4), and (5) of this section; or

((+)) 3. 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36621 (~~(Must the conductor be grounded for?)~~) **Grounding the conductor in AC premises wiring**(~~(?)~~). For AC premises wiring systems the identified conductor must be grounded.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36624 (~~(What)~~) **General requirements that 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36627 (~~(Must the)~~) **Continuous path to ground** (~~(be continuous?)~~). The path to ground from circuits, equipment, and enclosures must be permanent and continuous.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36630 (~~(What)~~) **Grounding supports, enclosures, and equipment** (~~(must be grounded?)~~). (1) Metal cable trays, metal raceways, and metal enclosures for conductors must be grounded.

Exceptions: ((#)) 1. Metal enclosures such as sleeves that are used to protect cable assemblies from physical damage need not be grounded; or

((#)) 2. 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:

((#)) a. Runs are less than 25 feet;

((#)) b. Enclosures are free from probable contact with ground, grounded metal, metal laths, or other conductive materials; and

((#)) c. 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;

(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:

(*) (i) Refrigerators, freezers, and air conditioners;

(*) (ii) Clothes-washing, clothes-drying and dishwashing machines, sump pumps, and electrical aquarium equipment;

(*) (iii) Hand-held motor-operated tools;

(*) (iv) The following motor-operated appliances: Hedge clippers, lawn mowers, snow blowers, and wet scrubbers;

(*) (v) 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;

((*) (vi) Tools likely to be used in wet and conductive locations; and

((*) (vii) 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36633 ((How must)) Grounding 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-36636 ((How must)) Grounding 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)) must 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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:

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36815 (~~What~~) Wiring requirements that 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 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36821 (~~Where must~~) Location of 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36824 (~~When must~~) Insulating 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36827 (~~When may~~) Use of 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;
- (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~~) must 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36830 (~~How must~~) Identification, splicing and termination of 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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 terminations. 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36836 (~~When may~~) Use of 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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~~) must 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.

(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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36851 (~~What requirements apply to~~) **Wiring for transformers**(~~(?)~~). (1) This section applies to the installation of all transformers.

Exceptions: ((~~+~~)) 1. Current transformers;
((~~+~~)) 2. Dry-type transformers installed as a component part of other apparatus;
((~~+~~)) 3. Transformers that are an integral part of a high frequency or electrostatic-coating apparatus;
((~~+~~)) 4. Transformers used with Class 2 and Class 3 circuits, sign and outline lighting, electric discharge lighting, and power-limited fire-protective signaling circuits; and
((~~+~~)) 5. 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.

(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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36857 ~~((How must storage))~~ **Ventilation for stored batteries** ~~((be ventilated?))~~ ~~((You))~~ The employer must ensure that there is sufficient diffusion and ventilation of gases from storage batteries to prevent the accumulation of explosive mixtures.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-36860 ~~((What other))~~ **Miscellaneous requirements that 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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))~~ must 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 cabi-

nets, the door must either open at least 90 degrees or be removable.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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))~~ must 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-37203 ~~((What does this section cover?))~~ **Scope.** 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 concentra-

tion 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-37206 (~~What~~) Classifications that apply to this section(~~?~~). These hazardous locations are classified as follows:

(1) (~~(1)~~) Class I locations(~~("are these"))~~. Locations 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 these))~~, Locations 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:

(~~(A)~~) (A) Volatile flammable liquids or liquefied flammable gases are transferred from one container to another;

(~~(B)~~) (B) Interiors of spray booths and areas in the vicinity of spraying and painting operations where volatile flammable solvents are used;

(~~(C)~~) (C) Locations containing open tanks or vats of volatile flammable liquids;

(~~(D)~~) (D) Drying rooms or compartments for the evaporation of flammable solvents;

(~~(E)~~) (E) Locations containing fat and oil extraction equipment using volatile flammable solvents;

(~~(F)~~) (F) Gas generator rooms and other portions of gas manufacturing plants where flammable gas may escape;

(~~(G)~~) (G) Inadequately ventilated pump rooms for flammable gas or for volatile flammable liquids;

(~~(H)~~) (H) The interiors of refrigerators and freezers in which volatile flammable materials are stored in open, lightly stoppered, or easily ruptured containers; and

(~~(I)~~) (I) 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 these))~~, Locations 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

(ii) 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:

(~~(A)~~) (A) 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.

(~~(B)~~) (B) 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 considered hazardous unless also subject to other hazardous conditions.

(~~(C)~~) (C) 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) (~~(1)~~) Class II locations(~~("are these"))~~. Locations that are hazardous because of the presence of combustible dust. They include the following:

(a) **Class II, Division 1 locations** (~~(are these))~~, Locations 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)~~), Locations 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)~~), Locations 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)~~), Locations 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)~~), Locations where easily ignitable fibers are stored or handled, except in process of manufacture.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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 (~~104 degrees Fahrenheit~~) 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~~) ~~Fahrenheit~~) 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 Class III locations need not be marked with the class, group, division, or operating temperature.

(3) Equipment that is safe for the location (~~(shall)~~) must 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-37212 (~~(How must)~~) **Installing 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-37215 (~~(Which)~~) **Equipment** (~~(may)~~) **to 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

**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 authorized 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-37409 (~~How are~~) **Classification of 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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 nonpower-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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-37603 (~~What does this section cover?~~) **Scope.** 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-37606 (~~Who may work~~) **Qualified person working 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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~~) must not reach blindly into areas that may contain energized parts.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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~~) must 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~~) must 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~~) the employer 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~~) must not be worn if they might contact exposed energized parts.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-37624 ((What)) Housekeeping requirements that apply to working near 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 silicon 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-37627 ((Who)) Qualified persons that 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-37801 ((What does this section cover?)) Scope. (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:

(A) The circuits are combined with installations of power generation equipment or circuits; and

(B) 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-37803 ((How must employees be trained)) Training employees 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)) **The employer** must provide either classroom or on-the-job training. The degree of training provided must be determined by the risk to the employee.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-37805 ((How-must)) Identification and use of 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.

(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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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:

((*) 1. The procedures address the electrical safety hazards covered by this part; and

((*) 2. The procedures include the requirements of WAC 296-307-37813(4) and 296-307-37815(2).

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-37809 ((Must)) An employer must 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-37813 ((How-must)) Application of 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-37815 (~~What work practices must be followed to verify~~) **Verifying 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~~) must 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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~~) must be a visual determination that all employees are clear of the circuits and equipment.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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 otherwise 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 not be allowed to 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-38003 (~~(How must)~~) **Use of 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-38009 (~~(What)~~) **Manufacturing and marking requirements that 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))~~ **must** be applied so they do not impair the insulating qualities of the equipment.
- (4) Markings on gloves must be on the cuff.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-38012 ((What)) Electrical requirements that 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, crack-

ing, 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:

- ((*) 1. American Society for Testing and Materials (ASTM) D 120-87, Specification for Rubber Insulating Gloves.
- ((*) 2. ASTM D 178-93, Specification for Rubber Insulating Matting.
- ((*) 3. ASTM D 1048-93, Specification for Rubber Insulating Blankets.
- ((*) 4. ASTM D 1049-93, Specification for Rubber Insulating Covers.
- ((*) 5. ASTM D 1050-90, Specification for Rubber Insulating Line Hose.
- ((*) 6. ASTM D 1051-87, Specification for Rubber Insulating Sleeves.

These standards contain specifications for conducting the tests required in this section.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-38015 ((What)) Workmanship and finish requirements that 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-38018 ((How-must)) Use and maintenance of 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:

(*) 1. American Society for Testing and Materials (ASTM) D 120-87, Specification for Rubber Insulating Gloves.

(*) 2. ASTM D 1048-93, Specification for Rubber Insulating Blankets.

(*) 3. ASTM D 1049-93, Specification for Rubber Insulating Covers.

(*) 4. ASTM D 1050-90, Specification for Rubber Insulating Line Hose.

(*) 5. ASTM D 1051-87, Specification for Rubber Insulating Sleeves.

(*) 6. ASTM F 478-92, Specification for In-Service Care of Insulating Line Hose and Covers.

(*) 7. ASTM F 479-88a, Specification for In-Service Care of Insulating Blankets.

(*) 8. 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) ~~(Y-00)~~ The employer 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

Table 2 D-C Proof-Test Requirements	
Class of Equipment	Proof-test voltage
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~~) must 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~~) must 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 voltage design 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~~) must 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

Table 5 Rubber Insulating Equipment Test Intervals	
Type of equipment	When to test
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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-40001 (~~What does this section cover?~~) Scope. WAC 296-307-400 covers the transportation and application of anhydrous ammonia.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-40003 (~~What~~) Definitions that apply to this section(~~?~~). (~~What~~) Certified(~~What does this mean?~~). 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.

(~~What~~) DOT(~~What does this mean?~~). The Federal Department of Transportation.

(~~What~~) DOT container(~~What does this mean?~~). A container constructed according to the requirements of 49 C.F.R. chapter 1.

(~~What~~) DOT cylinder(~~What does this mean?~~). A cylinder that meets the requirements of 49 C.F.R. chapter 1.

(~~What~~) Labeled(~~What does this mean?~~). 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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~~) The employer must ensure that equipment is inspected before each day's work. Conditions that would contribute to leaks (~~shall~~) must 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-40007 (~~What requirements apply to~~) Systems mounted on farm wagons (implements of husbandry) for the transportation of ammonia(~~?~~). All anhydrous 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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))~~ the employer 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))~~ The employer may use a union type connection between the tank valve and metering device. ~~((You))~~ The employer 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))~~ the employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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 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))~~ The employer 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))~~ the employer's custom equipment; and

(b) ~~((You have))~~ The employer has 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.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-40013 (~~What requirements apply to~~) 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.

Containers used with systems covered in subsection (4) of this section must be constructed and tested in accordance with the DOT specifications.

(4) Containers must comply with department of transportation specifications and must be maintained, filed, packaged, marked, labeled and shipped to comply with current DOT regulations and American National Standard Method of Marking Portable Compressed Gas Containers to Identify the Material Contained, Z48.1-1954 R1970. See Appendix C for availability.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-40015 ((How must)) Marking 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.

(4) "Marking refrigerated containers." Each refrigerated container must be marked with a name plate on the outer covering in an accessible place as specified in the following:

((*) (a) With the notation, "Anhydrous Ammonia";

((*) (b) With the name and address of the builder and the date of fabrication;

((*) (c) With the water capacity of the container in gallons, U.S. Standard;

((*) (d) With the design pressure;

((*) (e) With the minimum temperature in degrees Fahrenheit for which the container was designed;

((*) (f) The maximum allowable water level to which the container may be filled for test purposes;

((*) (g) With the density of the product in pounds per cubic foot for which the container was designed;

((*) (h) With the maximum level to which the container may be filled with liquid anhydrous ammonia.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-40017 ((Where may)) Locations for anhydrous ammonia containers ((be located?)) (1) When selecting the location for a storage container, ((you)) the employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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 con-

nection 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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)) the employer may use hose that meets the requirements of WAC 296-307-40023.

(6) Cast iron fittings are prohibited. ((You)) The employer 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)) The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-40023 ((What)) Specifications ((must)) for 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))~~ The employer 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))~~ the employer must ensure that the following information is etched, cast, or impressed at five-foot intervals:

- ~~((a))~~ (a) Anhydrous ammonia;
- ~~((b))~~ (b) xxx psig (maximum working pressure);
- ~~((c))~~ (c) Manufacturer's name or trademark;
- ~~((d))~~ (d) Year of manufacture.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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))~~ The employer 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
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

Surface Area sq. ft.	Flow Rate CFM Air	Surface Area sq. ft.	Flow Rate CFM Air	Surface Area sq. ft.	Flow Rate CFM Air
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:

~~((a))~~ (a) Hemispherical heads: Area = (Length in feet) X (outside diameter in feet) X 3.1416.

~~((b))~~ (b) Other than hemispherical heads: Area = (Length in feet) + (0.3 outside diameter in feet) X (outside diameter in feet) X 3.1416.

~~((c))~~ (c) Spherical container: Area = (outside diameter in feet)² X 3.1416.

~~((d))~~ (d) 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.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-40027 (~~What~~) Emergency precautions (~~are required~~) when handling anhydrous ammonia(~~?~~). (1) (~~You~~) The employer 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) Have two suitable gas masks in readily accessible locations. Full face masks with ammonia canisters as certified by NIOSH under 42 C.F.R. Part 84, are suitable for emergency action for most leaks, particularly those that occur outdoors. For protection in concentrated ammonia atmospheres, self-contained breathing apparatus is required.

(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.

*If ammonia vapors are detected when the mask is applied, leave the area immediately. 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 or as recommended by the canister manufacturer. 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 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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~~) must 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~~) must 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

(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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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 connection.

tions. 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.

(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).

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-40037 (~~How should~~) Maintenance of 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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 equipment and wiring must be specified by and installed according to chapter 296-307 WAC Part T, for Class I, Group D locations.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-41001 (~~What does this part cover~~) Scope. 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

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-41003 (~~Which~~) LP-gas installations (~~are~~) not covered by this part((?)). (1) This part does not apply to:

- LP-gas refrigerated storage systems;
- LP-gas used with oxygen;
- 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);
- 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-41005 (~~What~~) Definitions that apply to this part((?)). ((^u))Adequate ventilation((^u)) (for fire

prevention during normal operation(~~(means)~~). The concentration of the gas in a gas-air mixture does not exceed 25% of the lower flammable limit.

~~(means)~~ **Containers**(~~(means)~~). All vessels, such as tanks, cylinders, or drums, used to transport or store LP-gases.

~~(means)~~ **DOT**(~~(means)~~). The federal Department of Transportation.

~~(means)~~ **DOT container**(~~(means)~~). A container that meets DOT regulations.

~~(means)~~ **DOT cylinder**(~~(means)~~). A cylinder that meets DOT regulations.

~~(means)~~ **DOT regulations/requirements/specifications**(~~(means)~~). The DOT regulations of 49 C.F.R. Part 178.

~~(means)~~ **Liquefied petroleum gases**(~~(and)~~) **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.

~~(means)~~ **PSIA**(~~(means)~~). Pounds per square inch absolute.

~~(means)~~ **PSIG**(~~(means)~~). Pounds per square inch gauge.

~~(means)~~ **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.

~~(means)~~ **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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-41007 (~~(When must)~~) **Odorizing LP-gas** (~~(be odorized?)~~). (~~(You)~~) The employer 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)~~) The employer may use any odorant and quantity that meets the requirements of this section.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-41009 (~~(Must)~~) **Approval of 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.

~~(means)~~ **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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-41011 (~~(What)~~) **Construction and test requirements** (~~(must)~~) **for 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-41013 (~~(How must)~~) **Welding containers** (~~(be welded?)~~). (1) (~~(You)~~) The employer 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)~~) The employer may weld on saddle plates, lugs, or brackets attached to the container by the tank manufacturer.

(2) When (~~(you)~~) the employer must repair or modify DOT containers by welding, (~~(you)~~) the employer must return the container to a qualified manufacturer, making containers of the same type, to make the repair or modification according to DOT regulations.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-41015 (~~(How must)~~) **Marking containers** (~~(be marked?)~~). (1) (~~(You)~~) The employer 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.

(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."

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-41017 ((Where must)) Container((s be located?)) locations. ((ΥΘα)) The employer 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.

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.

(8) When dikes are used with flammable liquid tanks, no LP-gas containers are located within the diked area.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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 suitably 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))~~ must 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))~~ must 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))~~ The employer 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))~~ The employer must ensure that piping allows for expansion, contraction, jarring, and vibration, and settling. ~~((You))~~ The employer may use flexible connections.

(14) Piping outside buildings may be buried, aboveground, 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))~~ the employer must provide a means for re-vaporization of the condensate.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-41023 ~~((What))~~ Specifications ~~((must))~~ for hoses ~~((meet?))~~. (1) Hose ~~((shall))~~ must 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.

(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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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	950	15,470
65	1,640	230	4,630	1,000	16,100
70	1,750	240	4,800	1,050	16,720
75	1,850	250	4,960	1,100	17,350
80	1,950	260	5,130	1,150	17,960
85	2,050	270	5,290	1,200	18,570
90	2,150	280	5,450	1,250	19,180
95	2,240	290	5,610	1,300	19,780
100	2,340	300	5,760	1,350	20,380
105	2,440	310	5,920	1,400	20,980
110	2,530	320	6,080	1,450	21,570
115	2,630	330	6,230	1,500	22,160
120	2,720	340	6,390	1,550	22,740
125	2,810	350	6,540	1,600	23,320
130	2,900	360	6,690	1,650	23,900
135	2,990	370	6,840	1,700	24,470
140	3,080	380	7,000	1,750	25,050
145	3,170	390	7,150	1,800	25,620
150	3,260	400	7,300	1,850	26,180
155	3,350	450	8,040	1,900	26,750
160	3,440	500	8,760	1,950	27,310
165	3,530			2,000	

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:

(*) (a) Hemispherical heads: Area = (equals) (overall length) X (outside diameter) X 3.1416.

(*) (b) Other than hemispherical heads: Area = (equals) (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.

((*) (c) Spherical container: Area = (equals) (outside diameter)² X 3.1416.

((*) (d) Flow rate: CFM air = (equals) 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 = (equals) 53.632 A^{0.82} where A = (equals) 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
DOT	As prescribed in 49 C.F.R. 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 sec-

tion) permitted start-to-discharge pressure setting of the device.

(7) In high temperature areas, ((you)) the employer 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)) must 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-41027 ((How must)) Construction and installation of 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 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-41029 ((How must)) Construction and installation of 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-41031 ((How must)) Construction and installation of 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-41033 ((How must) Construction and installation of 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-41035 ((How must) Construction and installation of dehydrators ((be constructed and installed?)), The vaporizer section of vaporizer-burners used for dehydrators or dryers must be located outdoors; 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 shutoff 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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)) must 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		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 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-41041 (~~What requirements apply to transfer~~) **Transferring of liquids(?)**. When transferring liquids, (~~you~~) the employer 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 fifty 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 twenty-five 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 fifty 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.

(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~~) must be shut down when supply containers are filling unless the air intakes and sources of ignition on the equipment are located fifty 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-41043 (~~Must~~) **Training for workers** (~~be trained?~~). Workers performing installation, removal, operation, and maintenance work must be properly trained in that function.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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), pump-houses, 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.)

(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 spe-

cial precautions observed under carefully controlled conditions.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-41047 ((What)) Electrical requirements that 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

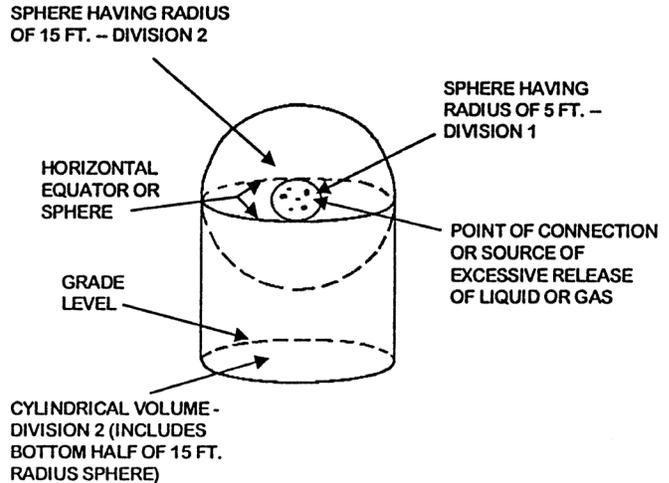
Part	Location	Extent of classified area ¹	Equipment ((shall)) <u>must</u> be suitable for Class I, Group D ²
A	Storage containers other than DOT cylinders	Within 15 feet in all directions from connections, except connections otherwise covered in this table	Division 2
B	Tank vehicle and tank car loading 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)) <u>must</u> 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	Entire room and any adjacent room not separated by a gastight partition	Division 1
		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	Division 2
	Indoors with adequate ventilation ⁴	Entire room and any adjacent room not separated by a gastight partition	Division 2
	Outdoors in open air at or above grade	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 2
F	Service station dispensing units	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 1
		Up to 18 inches above grade within 20 ft. horizontally from any edge of enclosure	Division 2
		<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		
	Without mechanical ventilation	Entire pit or trench	Division 1
		Entire room and any adjacent room not separated by a gastight partition	Division 2

Part	Location	Extent of classified area ¹	Equipment ((shall)) <u>must</u> be suitable for Class I, Group D ²
		Within 15 feet in all directions from pit or trench when located outdoors	Division 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

1 The classified area must not extend beyond an unpierced wall, roof, or solid vaportight partition.
 2 See chapter 296-46 WAC, and chapter 296-306A WAC Part T.

- When 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.
- Ventilation, 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.



AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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~~)) must 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))~~ must 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))~~ The employer must calculate the filling point for which the fixed liquid level gauge must be designed according to this section.

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 is known, however, ~~((you))~~ the employer 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:

$$\frac{\text{Water capacity of container}^1 \text{ (gals.)} \times \text{X filling density}^2}{\text{Specific gravity of LP-gas}^1 \times \text{volume correction factor}^3 \times 100} = \frac{\text{Maximum volume of LP-gas}}{\text{of LP-gas}}$$

- 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.

$$\frac{100 \text{ (gals.)} \times 42 \text{ (filling density)}}{0.510 \times 1.031 \text{ (correction factor from Table U-6)} \times 100} = \frac{4200}{52.6}$$

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.

$$\frac{\text{Maximum volume of LP-gas (from formula in (a) of this subsection)} \times 100}{\text{Total water content of container in gallons}} = \text{Maximum percent of LP-gas}$$

	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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-41051 ((What)) Requirements that 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-41501 (~~What does this section cover?~~) **Scope.** 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-41503 (~~What is a "cylinder system"?~~) **Cylinder system.** ((A "Cylinder system" ("))). Includes the container base or bracket, containers, container valves, connectors, manifold valve assembly, regulators, and relief valves.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-41505 (~~How must~~) **Marking containers** (~~be marked for~~) **used in 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 employer is 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-41507 (~~What~~) **Additional requirements that apply to cylinder systems installed outdoors**((?)). (1) Containers 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 three 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-41509 (~~What~~) **Additional requirements that 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)) must 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. ~~((Y-04))~~ The employer 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 containers 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))~~ must 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))~~ must 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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

Regulator delivery pressure	Relief valve start-to-discharge pressure setting (percent of 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~~) must 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-41515 ((What) Other requirements that 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-42001 ((What does this section cover?)) Scope. 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-42003 ((How must) Design and classification of non-DOT containers ((be designed and classified?)). Storage containers must be designed and classified according to Table U-8.

TABLE U-8

Container type	Minimum design pressures of container lb. per sp. in. gauge		
	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

- 1 New type 80 storage containers have not been authorized since Dec. 31, 1947.
- 2 Container type may be increased by increments of 25. The minimum design pressure of containers (~~(shall)~~ **must**) 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)~~ **must**) 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.
- 3 Construction of containers under the API-ASME Code is prohibited after July 1, 1961.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-42007 (~~What~~) Additional requirements that 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 296-307-41025(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)~~ **must** 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)~~ **must** 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-42009 ((When may)) Reinstallation of 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-42013 ((How must)) Installing 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))~~ **the employer** 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-42015 ((How must)) Protecting 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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))~~ **must** 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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~~) the employer 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~~) The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-42023 (~~What~~) Other requirements that 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~~) The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-42501 (~~What does this section cover?~~) Scope, (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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-42503 (~~What general requirements apply to~~) Using 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-42505 ((How must)) Design and classification of fuel containers ((be designed and classified?)), (1) Containers must meet the following requirements:

Container type	Minimum design pressure of container lb. per sq. in. gauge		
	For gases with vapor press. Not to exceed lb. per sq. 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

¹ Container type may be increased by increments of 25. The minimum design pressure of containers ((shall)) must 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)) must 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.
- ² Construction 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)) must 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.)

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-42507 ((How must)) Installing 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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 shutoff 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))~~ The employer should normally exchange removable fuel outdoors. When removable fuel containers are used, means ~~((shall))~~ must be provided in the fuel system to minimize the escape of fuel when the containers are exchanged. ~~((You))~~ The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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))~~ must 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 pressure 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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).

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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 Installation 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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).

(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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-42527 ((How must)) LP-gas-fueled vehicles to 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-43001 ((What does this section cover?)) Scope. 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

(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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-43005 ((How-must)) Containers ((be)) stored within buildings frequented by the public((?)). (1) 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

(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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-43501 ((What does this section cover?)) Scope. (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 otherwise 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-43503 (~~(How must containers be constructed?)~~) Container construction. 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 (~~(shell)~~) must also be calculated according to Appendix G of the American Society of Mechanical Engineers, Unfired Pressure Vessel Code, 1968. Fully loaded vehicles must be assumed to be operating under highway conditions equal to two "g" loading. The effects of fatigue (~~(shell)~~) must 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-43507 ((~~Where must systems be located?~~) Location of systems. (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.

(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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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~~)) must be mounted and protected as provided under WAC 296-307-43503 (2), (5), and (6).

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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).

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-43521 (~~What~~) General precautions the employer must (~~be followed~~) follow 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-43523 ((How must)) Containers to be charged((?)). Containers must be charged according to DOT specifications.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-44001 ((What does this section cover?)) Scope. 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-44003 ((How must)) Design and classification of 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.)	1949 and earlier editions of ASME Code (Par. U-68, U-69)	Minimum design pressure of container lb. per sp. in. gauge
			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

¹ Container type may be increased by increments of 25. The minimum design pressure of containers ((shall)) must 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)) must 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.

² Construction of containers under the API-ASME Code is not authorized after July 1, 1961.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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)) must be protected against physical damage. The outlet must have loose-fitting rain caps. There ((shall)) must 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)) The employer 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 seven 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))~~ the employer 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 ten 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 thirty 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-44011 ~~((How must))~~ Installation of 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

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))~~ the employer 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))~~ the employer 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 portion 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-44013 (~~What~~) Protecting equipment (~~must be protected~~) against tampering(~~?~~). Valves, regulators, gauges, and other container fittings must be protected against tampering and physical damage.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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~~) The employer must allow for expansion, contraction, jarring, and vibration, and for settling. (~~You~~) The employer may use flexible connections.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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~~) must be properly ventilated.

(6) Dispensing LP-gas into the fuel container of a vehicle (~~shall~~) must be performed by a competent attendant who (~~shall~~) must remain at the LP-gas dispenser during the entire transfer operation.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-44023 (~~Is smoking allowed~~) Smoking is prohibited at LP-gas service stations(~~?~~). Smoking is prohibited on the driveway of service stations in the dispensing areas or transport truck 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-445 Scope.

IMPORTANT:

((A)) **Dip tank** ((is)), A container holding a liquid other than plain water that is used for dipping or coating. An object may be completely or partially immersed (in a dip tank) or it may be suspended in a vapor coming from the tank.

Exemption: Dip tanks that use a molten material (molten metal, alloy, salt, etc.) are not covered by this chapter.

This chapter **applies** to:

((*) (1) A dip tank that uses a liquid other than plain water, or the vapor of the liquid, to:

- ((-) (a) Clean an object;
- ((-) (b) Coat an object;
- ((-) (c) Alter the surface of an object;

OR

((-) (d) Change the character of an object.

((*) (2) Draining or drying an object that has been dipped or coated.

Examples of covered dipping and coating operations include, but are not limited to:

- ((-) (a) Paint dipping;
- ((-) (b) Anodizing;
- ((-) (c) Pickling;
- ((-) (d) Quenching;
- ((-) (e) Tanning;
- ((-) (f) Degreasing;
- ((-) (g) Stripping;
- ((-) (h) Cleaning;
- ((-) (i) Dyeing.

Reference: ((You have)) The employer has to do a hazard assessment to identify hazards or potential hazards in ((you)) the workplace and determine if PPE is necessary to protect ((you)) employees. See personal protective equipment (PPE), WAC 296-307-100 through 296-307-10025.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-450 General requirements.

Summary.

((You)) Employer responsibility:

Safeguard employees working with dip tanks.

((You must:

CONSTRUCTION

~~Construct safe dip tanks~~

~~WAC 296-307-45005~~

VENTILATION

~~Provide proper ventilation for the vapor area~~

~~WAC 296-307-45010~~

~~Take additional precautions if you recirculate ventilation system exhaust air into the workplace~~

~~WAC 296-307-45015~~

~~Take additional precautions when using an exhaust hood~~

~~WAC 296-307-45020~~

INSPECTION

~~Periodically inspect your dip tanks and associated equipment and correct any deficiencies~~

~~WAC 296-307-45025~~

FIRST AID

~~Make sure employees working near dip tanks know appropriate first-aid procedures~~

~~WAC 296-307-45030~~

CLEANING

~~Prepare dip tanks before cleaning~~

~~WAC 296-307-45035~~

WELDING

~~Protect employees during welding, burning or other work using open flames~~

~~WAC 296-307-45045~~

LIQUIDS HARMFUL TO SKIN

~~Provide additional protection for employees working near dip tanks that use liquid that may burn, irritate, or otherwise harm the skin~~

~~WAC 296-307-45050-))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>CONSTRUCTION</u>	
<u>Construct safe dip tanks.</u>	<u>WAC 296-307-45005</u>
<u>VENTILATION</u>	
<u>Provide proper ventilation for the vapor area.</u>	<u>WAC 296-307-45010</u>
<u>The employer must take additional precautions if the ventilation system recirculates exhaust air into the workplace.</u>	<u>WAC 296-307-45015</u>
<u>The employer must take additional precautions when using an exhaust hood.</u>	<u>WAC 296-307-45020</u>
<u>INSPECTION</u>	
<u>Periodically inspect dip tanks and associated equipment and correct any deficiencies.</u>	<u>WAC 296-307-45025</u>
<u>FIRST AID</u>	
<u>Make sure employees working near dip tanks know appropriate first-aid procedures.</u>	<u>WAC 296-307-45030</u>
<u>CLEANING</u>	

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Prepare dip tanks before cleaning.</u>	<u>WAC 296-307-45035</u>
WELDING	
<u>Protect employees during welding, burning or other work using open flames.</u>	<u>WAC 296-307-45045</u>
LIQUIDS HARMFUL TO SKIN	
<u>Provide additional protection for employees working near dip tanks that use liquid that may burn, irritate, or otherwise harm the skin.</u>	<u>WAC 296-307-45050</u>

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-45005 Construct safe dip tanks.

~~((You must:~~

•)) The employer must make sure dip tanks, including any drain boards, are strong enough to support the expected load.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-45010 Provide proper ventilation for the vapor area.

~~((You must:~~

•)) (1) The employer must make sure mechanical ventilation meets the requirements of one or more of the following standards:

((-) (a) NFPA 34-1995, Standard for Dipping and Coating Processes Using Flammable or Combustible Liquids;

((-) (b) ACGIH's "Industrial Ventilation: A Manual of Recommended Practice" (22nd ed., 1995);

((-) (c) ANSI Z9.1-1971, Practices for Ventilation and Operation of Open-Surface Tanks and ANSI Z9.2-1979, Fundamentals Governing the Design and Operation of Local Exhaust Systems.

Note: Some, or all, of the consensus standards (such as ANSI and NFPA) may have been revised. If ~~((you empty))~~ the employer complies with a later version of a consensus standard, ~~((you))~~ the employer will be considered to have complied with any previous version of the same consensus standard.

~~((You must:~~

•)) (2) The employer must limit the vapor area to the smallest practical space by using mechanical ventilation;

((•)) (3) The employer must keep airborne concentration of any substance below twenty-five percent of its lower flammable limit (LFL);

((•)) (4) The employer must make sure mechanical ventilation draws the flow of air into a hood or exhaust duct;

((•)) (5) The employer must have a separate exhaust system for each dip tank if the combination of substances being removed could cause a:

- ((-) (a) Fire;
- ((-) (b) Explosion;
- OR
- ((-) (c) Potentially hazardous chemical reaction.

Reference: ~~((You))~~ The employer needs to keep employee exposure within safe levels when the liquid in a dip tank creates an exposure hazard. See Respiratory hazards, chapter 296-307 WAC, Part Y-6.

Note: ~~((You))~~ The employer may use a tank cover or material that floats on the surface of the liquid to replace or assist ventilation. The method or combination of methods ~~((you choose))~~ selected by the employer has to maintain the airborne concentration of the hazardous material and the employee's exposure within safe limits.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-45015 ~~((Take))~~ Additional precautions if ~~((you recirculate))~~ recirculating ventilation system exhaust air into the workplace.

~~((You must:~~

•)) (1) The employer must only recirculate air that contains no substance at a concentration that could pose a health or safety hazard to employees;

((•)) (2) The employer must make sure any exhaust system that recirculates air into the workplace:

((-) (a) Passes the air through a device that removes contaminants;

((-) (b) Sounds an alarm and automatically shuts down the dip tank operation, if the vapor concentration of any substance in the exhaust air exceeds twenty-five percent of its LFL;

((-) (c) Monitors the concentration of vapor from flammable or combustible liquids with approved equipment.

Notes: ((•)) 1. The LFL concentration in the air must be determined after the air passes through the air-cleaning device and before the air reenters the workspace.

((•)) 2. Most substances will pose a health hazard at a concentration far below twenty-five percent of its LFL.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-45020 Take additional precautions when using an exhaust hood.

~~((You must:~~

•)) The employer must make sure each room with an exhaust hood has a source of outside air that:

((-) (1) Enters the room in a way that will not interfere with the function of the hood;

((-) (2) Replaces at least ninety percent of the air taken in through the hood.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-45025 Periodically inspect ~~((your))~~ dip tanks and associated equipment and correct any deficiencies.

~~((You must:~~

*) (1) The employer must inspect or test ((you#)) the dip tanks and associated equipment periodically, including:

- ((-) (a) Covers;
 - ((-) (b) Overflow pipes;
 - ((-) (c) Bottom drains and valves;
 - ((-) (d) Electrical wiring, equipment, and grounding connections;
 - ((-) (e) Ventilating systems;
 - ((-) (f) Fire extinguishing equipment.
- (*) (2) The employer must inspect the hoods and ductwork of the ventilation system for corrosion and damage and make sure the airflow is adequate:

- ((-) (a) At least quarterly during operation;
 - ((-) (b) Prior to operation after a prolonged shutdown.
- (*) (3) The employer must promptly fix any deficiencies found.

Notes: (*) 1. To assist ((you#)) the employer in tracking ((you#)) inspections and actions taken from those inspections, ((you#)) the employer may want to keep a written record.
(*) 2. It is recommended that inspections be at least quarterly even if the system is not operating. Depending on the chemicals in use more frequent inspection may be required.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-45030 Make sure employees working near dip tanks know appropriate first-aid procedures.

~~((You must:))~~

*) The employer must make sure ((you#)) employees know the appropriate first-aid procedures for the hazards of ((you#)) dipping and coating operations.

Notes: (*) 1. First-aid procedures are contained in the material safety data sheet (MSDS) for the chemicals used in the dip tank.
(*) 2. First-aid supplies appropriate for the hazards of the dipping or coating operation need to be located near the dip tank to be considered "readily available" as required by WAC 296-307-03920.

Reference: There are additional requirements that may include providing emergency washing facilities and employee training. See first aid, WAC 296-307-039, and employer chemical hazard communication, WAC 296-307-550.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-45035 Prepare dip tanks before cleaning.

~~((You must:))~~

- (1) The employer must drain the contents of the tank and open any cleanout doors.
- (2) The employer must ventilate the tank to clear any accumulated hazardous vapors.

Reference: There may be requirements that apply before an employee enters a dip tank. See Confined spaces, WAC 296-307-642 and safety procedures, WAC 296-307-320.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-45045 Protect employees during welding, burning, or other work using open flames.

~~((You must:))~~

*) The employer must make sure the dip tank and the area around it are thoroughly cleaned of solvents and vapors before performing work involving:

- ((-) (1) Welding;
- ((-) (2) Burning;
- OR**
- ((-) (3) Open flames.

Reference: There are additional requirements for this type of work. See Welding, cutting and brazing, WAC 296-307-475, and Respirators, chapter 296-307 WAC, Part Y-5.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-45050 Protect employees that use liquids that may burn, irritate, or otherwise harm the skin.

~~((You must:))~~

(1) The employer must make sure washing facilities, including hot water, are available for every ten employees that work with dip tank liquids.

(2) The employer must satisfy medical requirements:

- (*) (a) Make sure an employee with any small skin abrasion, cut, rash, or open sore receives treatment by a properly designated person;
- (*) (b) Make sure an employee with a sore, burn, or other skin lesion that needs medical treatment, has a physician's approval before they perform their regular work;

(*) (c) Make sure employees who work with chromic acid receive periodic examinations of their exposed body parts, especially their nostrils.

Notes: (*) 1. Periodic means on a yearly basis unless otherwise indicated.
(*) 2. Any time chromic acid spills onto an employee's skin or their clothing is saturated, a physician should be responsible for evaluating and monitoring the area where chromic acid made contact with the skin.

~~((You must:))~~

(3) The employer must provide lockers or other storage space to prevent contamination of street clothes.

Reference: ~~((You have))~~ The employer has to do a hazard assessment to identify hazards or potential hazards in ((you#)) the workplace and determine if PPE is necessary to protect ((you#)) employees. See Personal protective equipment (PPE), WAC 296-307-100.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-455 Additional requirements for dip tanks using flammable or combustible liquids.

Summary.

IMPORTANT:

This section applies to:

- (*) 1. Flammable and combustible liquids (flashpoint below 200°F).

((*) 2. Liquids that have a flashpoint of 200°F (93.3°C) or higher if ((you):

((-) a. Heat the liquid;

((-) b. Dip a heated object in the tank;

((Your)) Employer responsibility:

Safeguard employees working with dip tanks containing flammable or combustible liquids.

~~((You must:~~

~~**CONSTRUCTION**~~

~~Include additional safeguards when constructing dip tanks~~

~~WAC 296-307-45505~~

~~Provide overflow pipes~~

~~WAC 296-307-45510~~

~~Provide bottom drains~~

~~WAC 296-307-45515~~

~~**FIRE PROTECTION**~~

~~Provide fire protection in the vapor area~~

~~WAC 296-307-45520~~

~~Provide additional fire protection for large dip tanks~~

~~WAC 296-307-45525~~

~~**ELECTRICAL WIRING AND EQUIPMENT AND SOURCES OF IGNITION**~~

~~Prevent static electricity sparks or arcs when adding liquids to a dip tank~~

~~WAC 296-307-45535~~

~~Control ignition sources~~

~~WAC 296-307-45540~~

~~Provide safe wiring and electrical equipment where the liquid can drip or splash~~

~~WAC 296-307-45545~~

~~**HOUSEKEEPING**~~

~~Keep the area around dip tanks clear of combustible material and properly dispose of waste~~

~~WAC 296-307-45550~~

~~**HEATING LIQUID**~~

~~Make sure heating the liquid in your dip tanks does not cause a fire~~

~~WAC 296-307-45555~~

~~**HEAT DRYING**~~

~~Make sure a heating system used for drying objects does not cause a fire~~

~~WAC 296-307-45560~~

~~**CONVEYORS**~~

~~Make sure the conveyor system for dip tanks is safe~~

~~WAC 296-307-45565))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
CONSTRUCTION	
Additional safeguards when constructing dip tanks.	<u>WAC 296-307-45505</u>
Provide overflow pipes.	<u>WAC 296-307-45510</u>
Provide bottom drains.	<u>WAC 296-307-45515</u>
FIRE PROTECTION	
Fire protection in the vapor area.	<u>WAC 296-307-45520</u>

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
Additional fire protection for large dip tanks.	<u>WAC 296-307-45525</u>
ELECTRICAL WIRING AND EQUIPMENT AND SOURCES OF IGNITION	
Prevention of static electricity sparks or arcs when adding liquids to a dip tank.	<u>WAC 296-307-45535</u>
Control ignition sources.	<u>WAC 296-307-45540</u>
Provide safe wiring and electrical equipment where the liquid can drip or splash.	<u>WAC 296-307-45545</u>
HOUSEKEEPING	
Keep the area around dip tanks clear of combustible material and properly dispose of waste.	<u>WAC 296-307-45550</u>
HEATING LIQUID	
Make sure heating the liquid in dip tanks does not cause a fire.	<u>WAC 296-307-45555</u>
HEAT DRYING	
Make sure a heating system used for drying objects does not cause a fire.	<u>WAC 296-307-45560</u>
CONVEYORS	
Make sure the conveyor system for dip tanks is safe.	<u>WAC 296-307-45565</u>

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-45505 ((Include)) Additional safeguards when constructing dip tanks.

~~((You must:))~~

(1) The employer must make sure the dip tank, drain boards (if provided), and supports are made of noncombustible material.

(2) The employer must make sure piping connections on drains and overflow pipes allow easy access to the inside of the pipe for inspection and cleaning.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-45510 Provide overflow pipes.

~~((You must:~~

*) (1) The employer must provide an overflow pipe on dip tanks that:

((-) (a) Hold more than one hundred fifty gallons of liquid;

OR

((-)) (b) Have more than ten square feet of liquid surface area.

((*) (2) The employer must make sure the overflow pipe is:

- ((-) (a) Properly trapped;
- ((-) (b) Able to prevent the dip tank from overflowing;
- ((-) (c) Three inches or more (7.6 cm) in diameter;
- ((-) (d) Discharged to a safe location.

Note: Discharged to a safe location could be a:
 ((*) 1. Safe location outside the building;

OR

((*) 2. Closed, properly vented salvage tank or tanks that can hold more than the dip tank.

~~((You must:~~

*) (3) The employer must make sure the bottom of the overflow pipe is at least six inches (15.2 cm) below the top of the tank.

Note: The overflow pipe should be large enough to remove water applied to the liquid surface of the dip tank from automatic sprinklers or other sources in the event of fire. Smaller dip tanks should be equipped with overflow pipes, if practical.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-45515 Provide bottom drains.

Exemption: A bottom drain is not required if:
 ((-) 1. The viscosity of the liquid makes it impractical to empty the tank by gravity or pumping;

OR

((-) 2. The dip tank has an automatic closing cover that meets the requirements of WAC 296-307-45530.

~~((You must:~~

*) (1) The employer must provide a bottom drain on all dip tanks that hold more than five hundred gallons of liquid;

((*) (2) The employer must make sure the bottom drain:

- ((-) (a) Is properly trapped;
- ((-) (b) Will empty the dip tank during a fire;
- ((-) (c) Has pipes large enough to empty the tank within five minutes;
- ((-) (d) Uses automatic pumps if gravity draining is not practical;
- ((-) (e) Is capable of both manual and automatic operation;
- ((-) (f) Discharges to a safe location.

Note: Discharges to a safe location could be a:
 ((*) 1. Safe location outside the building;

OR

((*) 2. Closed, properly vented salvage tank or tanks that can hold more than the dip tank.

~~((You must:~~

*) (3) The employer must make sure manual operation of the bottom drain is performed from a safe and easily accessible location.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-45520 ((Provide)) Fire protection in the vapor area.

~~((You must:~~

*) The employer must provide a manual fire extinguisher near the tank that is suitable for putting out flammable and combustible liquid fires.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-45525 ((Provide)) Additional fire protection for large dip tanks.

~~((You must:~~

*) (1) The employer must provide at least one automatic fire extinguishing system or an automatic dip tank cover if the tank:

((-) (a) Holds one hundred fifty gallons or more of liquid;

OR

((-) (b) Has four square feet or more of liquid surface area.

((*) (2) The employer must make sure automatic fire extinguishing systems or automatic dip tank covers meet the requirements of Table 1.

Exemption: An automatic fire extinguishing system or an automatic dip tank cover is **not** required for a hardening or tempering tank that:

((*) 1. Holds less than five hundred gallons;

OR

((*) 2. Has less than twenty-five square feet of liquid surface area.

Table 1: Automatic Fire Protection System Requirements

If ((you)) the employer provides:	((Then you)) The employer must:
An automatic fire extinguishing system	<ul style="list-style-type: none"> • Use extinguishing materials suitable for a fire fueled by the liquid in the tank • Make sure the system protects the: <ul style="list-style-type: none"> - Tanks - Drain boards - Stock over drain boards.
A dip tank cover	<ul style="list-style-type: none"> • Make sure the cover is: <ul style="list-style-type: none"> - Closed by approved automatic devices in the event of fire - Able to be manually activated - Kept closed when the tank is not being used - Made of noncombustible material or metal-clad material with locked metal joints.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-45535 (~~Prevent~~) Prevention of static electricity sparks or arcs when adding liquids to a dip tank.

~~((You must:~~

*) The employer must make sure any portable container used to add liquid to the tank is:

- ((-) (1) Electrically bonded to the dip tank;
- ((-) (2) Positively grounded.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-45540 Control ignition sources.

~~((You must:~~

(1) The employer must make sure the vapor areas and adjacent areas do not have any:

- ((*) (a) Open flames;
- ((*) (b) Spark producing devices;
- ((*) (c) Heated surfaces hot enough to ignite vapors.

(2) The employer must use explosion-proof wiring and equipment in the vapor area.

Reference: Electrical wiring and equipment has to meet the requirements of the applicable hazardous (classified) location. See Hazardous (classified) locations, WAC 296-307-37209.

~~((You must:~~

(3) The employer must prohibit smoking in any vapor area: ((*) Post an easily seen "NO SMOKING" sign near each dip tank.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-45545 Provide safe electrical wiring and equipment where the liquid can drip or splash.

~~((You must:~~

*) The employer must make sure all electrical wiring and equipment in the vapor area is approved for areas that have:

- ((-) (1) Deposits of easily ignited residue;
- ((-) (2) Explosive vapor.

Exemption: This does not apply to wiring that is:

- ((-) 1. In rigid conduit, threaded boxes or fittings;
- ((-) 2. Has no taps, splices, or terminal connections.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-45550 Keep the area around dip tanks clear of combustible material and properly dispose of waste.

~~((You must:~~

(1) The employer must make sure the area surrounding dip tanks is:

- ((-) (a) Completely free of combustible debris;
- ((-) (b) As free of combustible stock as possible.

(2) The employer must provide approved metal waste cans that are:

((-) (a) Used for immediate disposal of rags and other material contaminated with liquids from dipping or coating operations;

((-) (b) Emptied and the contents properly disposed of at the end of each shift.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-45555 Make sure heating the liquid in (~~your~~) dip tanks does not cause a fire.

~~((You must:~~

*) The employer must keep the temperature of the liquid in the dip tank:

- ((-) (1) Below the liquid's boiling point;
- ((-) (2) At least 100°F below the liquid's autoignition temperature.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-45560 Make sure a heating system used for drying objects does not cause a fire.

~~((You must:~~

*) The employer must make sure the heating system used in a drying operation that could cause ignition:

- ((-) (1) Has adequate mechanical ventilation that operates before and during the drying operation;
- ((-) (2) Shuts down automatically if a ventilating fan fails to maintain adequate ventilation;
- ((-) (3) Is installed as required by NFPA 86-1999, Standard for Ovens and Furnaces.

Note: Some, or all, of the consensus standards (such as ANSI and NFPA) may have been revised. If (~~you comply~~) the employer complies with a later version of a consensus standard, (~~you~~) the employer will be considered to have complied with any previous version of the same consensus standard.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-45565 Make sure conveyor systems are safe.

~~((You must:~~

*) The employer must make sure the conveyor system shuts down automatically if:

- ((-) (1) The ventilation system fails to maintain adequate ventilation;

OR

- ((-) (2) There is a fire.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-460 Additional requirements for dip tanks used for specific processes.

~~((Summary:~~

~~Your~~) **Employer responsibility:**

Safeguard employees working with dip tanks used for specific processes.

~~((You must:~~

HARDENING OR TEMPERING

Meet specific requirements if you use a hardening or tempering tank

WAC 296-307-46005

VAPOR DEGREASING

Provide additional safeguards for vapor degreasing tanks

WAC 296-307-46025

SPRAY CLEANING OR DEGREASING

Control liquid spray over an open surface cleaning or degreasing tank

WAC 296-307-46030

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
HARDENING OR TEMPERING	
<u>Meet specific requirements if using a hardening or tempering tank.</u>	<u>WAC 296-307-46005</u>
VAPOR DEGREASING	
<u>Additional safeguards for vapor degreasing tanks.</u>	<u>WAC 296-307-46025</u>
SPRAY CLEANING OR DEGREASING	
<u>Control liquid spray over an open surface cleaning or degreasing tank.</u>	<u>WAC 296-307-46030</u>

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-46005 Meet specific requirements if ((you use)) using a hardening or tempering tank.

~~((You must:))~~

(1) The employer must provide an automatic fire extinguishing system or an automatic dip tank cover for any hardening and tempering tank that uses flammable or combustible liquids and:

((-)) (a) Holds five hundred gallons (1893 L) or more of liquid;

OR

((-)) (b) Has twenty-five square feet (2.37 m²) or more of liquid surface area.

(2) The employer must prevent fires.

((*) (a) Make sure hardening and tempering tanks are:

((-)) (i) **Not** located on or near combustible flooring;

((-)) (ii) Located as far away as practical from furnaces;

((-)) (iii) Equipped with noncombustible hoods and vents (or equally effective devices) for venting to the outside.

((*) (b) Treat vent ducts as flues and keep them away from combustible material, particularly roofs.

(3) The employer must make sure air under pressure is not used to:

((*) (a) Fill the tank;

OR

((*) (b) Agitate the liquid in the tank.

(4) The employer must equip each tank with an alarm that will sound when the temperature is within 50°F (10°C) of the liquid's flashpoint (alarm set point).

(5) The employer must make sure a limit switch shuts down conveyors supplying work to the tank when the temperature reaches the alarm setpoint, if operationally practical.

(6) Have a circulating cooling system if the temperature of the liquid can exceed the alarm set point.

Note: The bottom drain of the tank may be combined with the oil circulating system if the requirements for bottom drains in WAC 296-307-45515 are satisfied.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-46025 ((Provide)) Additional safeguards for vapor degreasing tanks.

~~((You must:))~~

(1) The employer must make sure, if the tank has a condenser or a vapor-level thermostat, that it keeps the vapor level at least:

((*) (a) Thirty-six inches (91 cm) below the top of the tank if the width of the tank is seventy-two inches or more;

OR

((*) (b) One-half the tank width below the top of the tank if the tank is less than seventy-two inches wide.

(2) The employer must make sure, if ((you use)) gas is used as a fuel to heat the tank liquid, that the combustion chamber is airtight (except for the flue opening) to prevent solvent vapors from entering the air-fuel mixture.

(3) The employer must make sure the exhaust flue:

((*) (a) Is made of corrosion-resistant material;

((*) (b) Extends to the outside;

((*) (c) Has a draft diverter if mechanical exhaust is used.

(4) The employer must take special precautions to keep solvent vapors from mixing with the combustion air of the heater if chlorinated or fluorinated hydrocarbon solvents (for example, trichloroethylene or freon) are used in the dip tank.

(5) The employer must keep the temperature of the heating element low enough to keep a solvent or mixture from:

((*) (a) Decomposing;

OR

((*) (b) Generating excessive vapor.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-46030 Control liquid spray over an open surface cleaning or degreasing tank.

~~((You must:))~~

~~(*)~~ The employer must control the spray to the greatest extent feasible by:

((-)) (1) Enclosing the spraying operation as completely as possible;

((-)) (2) Using mechanical ventilation to provide enough inward air velocity to prevent the spray from leaving the vapor area.

Note: Mechanical baffles may be used to help prevent the discharge of spray.

Reference: Spray painting operations are covered in Spray-finishing operations, WAC 296-62-11019.

AMENDATORY SECTION (Amending WSR 03-10-068, filed 5/6/03, effective 8/1/03)

WAC 296-307-465 Definitions.

ACGIH((+)), American Conference of Governmental Industrial Hygienists.

Adjacent area((+)), Any area within twenty feet (6.1 m) of a vapor area that is not separated from the vapor area by tight partitions.

ANSI((+)), American National Standards Institute.

Approved((+)), Approved or listed by a nationally recognized testing laboratory. Refer to Federal Regulation 29 C.F.R. 1910.7, for definition of nationally recognized testing laboratory.

Autoignition temperature((+)), The minimum temperature required to cause self-sustained combustion without any other source of heat.

Combustible liquid((+)), A liquid having a flashpoint of at least 100°F (37.8°C) and below 200°F (93.3°C). Mixtures with at least ninety-nine percent of their components having flashpoints of 200°F (93.3°C) or higher are not considered combustible liquids.

Detearing((+)), A process for removing excess wet coating material from the bottom edge of a dipped or coated object or material by passing it through an electrostatic field.

Dip tank((+)), A container holding a liquid other than plain water that is used for dipping or coating. An object may be immersed (or partially immersed) in a dip tank or it may be suspended in a vapor coming from the tank.

Flammable liquid((+)), 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 ninety-nine percent or more of the total volume of the mixture.

Flashpoint((+)), The minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested by any of the measurement methods described in the definition of flashpoint in WAC 296-307-55060.

Lower flammable limit((+)), The lowest concentration of a material that will propagate a flame. The LFL is usually expressed as a percent by volume of the material in air (or other oxidant).

NFPA((+)), National Fire Protection Association.

Vapor area((+)), Any area in the vicinity of dip tanks, their drain boards or associated drying, conveying, or other equipment where the vapor concentration could exceed twenty-five percent of the lower flammable limit (LFL) for the liquid in the tank.

You((+Means)), The employer.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-47501 ((What)) Definitions that apply to this part((?)), ((("))Welder(("and")) 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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)) the employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-48007 (~~How must~~) **Storing fuel-gas cylinders ((be stored?)**. Cylinders stored indoors, except those in use or 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) C.F.R., 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) C.F.R. 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-48009 (~~How must~~) **Storing 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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))~~ The employer should notify the supplier promptly and follow the supplier's instructions as to their return.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-48015 ((How must)) Transporting 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.

(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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-48017 ((How must)) Handling 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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))~~ the employer has trouble with a cylinder, ~~((you))~~ the

employer should send a report to the supplier indicating the character of the trouble and the cylinder's serial number. ~~((You))~~ The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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) C.F.R.

(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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

(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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-48031 ((~~What~~) Operating procedures ((~~apply to~~)) for 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-48033 ((How-must)) Design of service piping systems ((be-designed?)). (1) Piping and fittings must comply with 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-48037 ((How-must)) Installation of service piping systems ((be-installed?)). (1) Distribution lines must be installed and maintained in a safe operating condition.

(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 pipe-lines, 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-48039 ((How must)) Painting and marking service piping systems ((be painted and marked?)) (1) Underground pipe and 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-48041 ((How must)) Testing 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-48043 ((How must equipment be installed?)) Equipment installation. Equipment shall be installed and used only in the service for which it is approved and as recommended by the manufacturer.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-48045 ((How must service)) Protecting 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

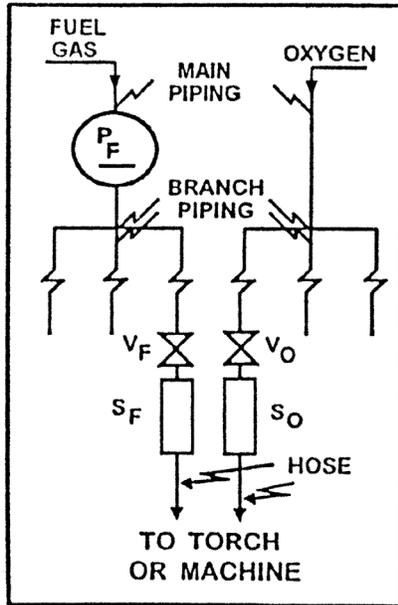


Fig. 1

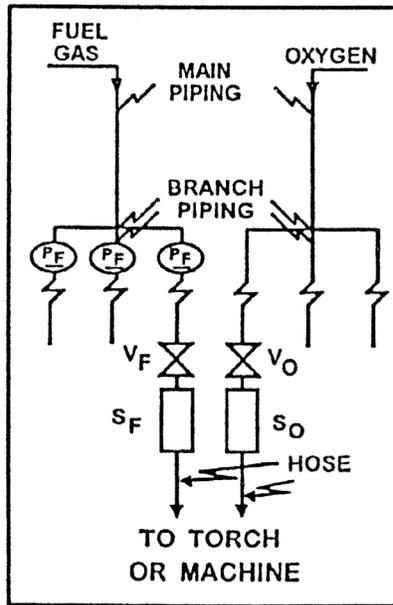


Fig. 2

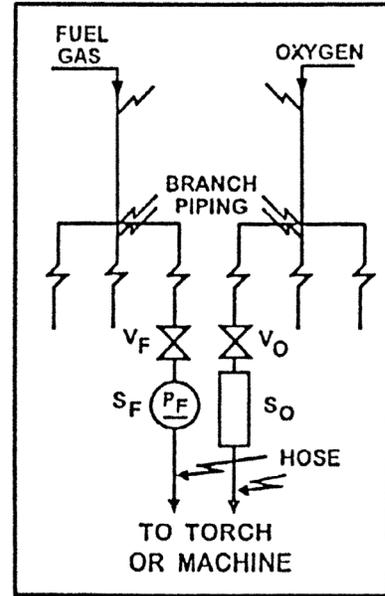


Fig. 3

- 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))~~ must 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))~~ must 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

(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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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~~) must 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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))~~ must be used for each job.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-48509 ~~((What))~~ **Maintenance** ~~((requirements apply to))~~ **of 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-49001 ~~((What))~~ **Environmental conditions** ~~((must))~~ **required to be taken into account when selecting arc welding equipment**~~((?))~~.

Note: ~~((You))~~ The employer 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(-

▲):

- (a) Unusually corrosive fumes;
- ~~((▲))~~ (b) Steam or excessive humidity;
- ~~((▲))~~ (c) Excessive oil vapor;
- ~~((▲))~~ (d) Flammable gases;
- ~~((▲))~~ (e) Abnormal vibration or shock;
- ~~((▲))~~ (f) Excessive dust;

~~((▲))~~ (g) Weather;

~~((▲))~~ (h) Unusual seacoast or shipboard conditions.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-49003 ~~((What))~~ **Voltages** ~~((must))~~ **when using 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-49005 ~~((How must))~~ **Designing 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 overcurrent 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))~~ The employer may provide protection with:

~~((▲))~~ (a) Dead-front receptacles for plug connections;

~~((▲))~~ (b) Recessed openings with nonremovable hinged covers;

~~((▲))~~ (c) Heavy insulating sleeving or taping; or

(*) (d) 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-49007 ((How must)) Installing 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-49009 ((How must)) Grounding 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

(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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-49013 ((How must)) Operating 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)) must 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) ((Yøø)) The employer 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) ((Yøø)) The employer 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.

(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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-49015 ((How must)) Maintaining 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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))~~ The employer is responsible for the safe use of cutting and welding equipment on ~~((you))~~ the property and:

(a) Based on fire potentials of plant facilities, ~~((you))~~ the employer must establish areas and procedures for cutting and welding;

(b) ~~((You))~~ The employer must designate an individual responsible for authorizing cutting and welding operations in areas not specifically designed for such processes;

(c) ~~((You))~~ The employer 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))~~ The employer 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

(ii) 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-49505 (~~What~~) Precautions (~~must~~) to 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-49507 (~~What~~) Precautions (~~must~~) to 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-50003 ((What)) Specifications ((must)) for 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
Shielded metal-arc welding:	

Welding Operation	Shade No.
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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-50005 ((What)) Protective clothing ((must)) for 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-50007 (~~What~~) Other requirements that apply to employee protection(?). (1) (~~You~~) The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-50009 (~~What~~) Employee protection ((~~must be provided~~) for work 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-50011 (~~What~~) General requirements that 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~~) The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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

Welding zone	Minimum air flow cubic feet/minutes	Duct diameter inches
8 to 10 inches from arc or torch	425	4-1/2
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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

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 WAC 296-307-62625. 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

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 WAC 296-307-62625. 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-52001 (~~What does this section cover?~~) **Scope.** WAC 296-307-520 applies to all powered industrial trucks used in agricultural operations.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-52003 (~~What is a "~~) **Powered industrial truck(("?)**. (~~"~~) **Powered industrial truck((" or ")** 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.

AMENDATORY SECTION (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

WAC 296-307-52005 (~~What~~) Manufacturer's requirements that apply to powered industrial trucks(?) (1) All powered industrial trucks in use by an employer must meet the applicable requirements of design, construction and stability as defined by the American National Standards Institute B56.1-1969, Safety Standards for Powered Industrial Trucks, except for vehicles intended primarily for earth moving or over-the-road hauling. All new powered industrial trucks acquired and used by an employer on or after March 1, 2000, must meet the applicable requirements of design, construction and stability as defined in ASME B56.1-1993. The employer must ensure that all powered industrial trucks are inspected, maintained and operated in accordance with this section and the manufacturer's recommendations and specifications.

(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.

AMENDATORY SECTION (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

WAC 296-307-52007 (~~What are the~~) Classifications of powered industrial trucks(?) Powered industrial trucks are identified according to the following classifications:

(1) (~~"D" refers to~~) **D Classification.** Trucks that are diesel engine powered that have minimum safeguards against inherent fire hazards.

(2) (~~"DS" refers to~~) **DS Classification.** Diesel powered trucks that, in addition to meeting all the requirements for the type D trucks, with additional safeguards to the exhaust, fuel, and electrical systems.

(3) (~~"DY" refers to~~) **DY Classification.** Diesel powered trucks that have all the safeguards of the DS trucks; in addition, any electrical equipment is completely enclosed. They are equipped with temperature limitation features.

(4) (~~"E" refers to~~) **E Classification.** Electrically powered trucks with minimum acceptable safeguards against inherent fire hazards.

(5) (~~"ES" refers to~~) **ES Classification.** Electrically powered trucks that, in addition to all of the requirements for the E trucks, are provided with additional safeguards to the electrical system to prevent emission of hazardous sparks and to limit surface temperatures.

(6) (~~"EE" refers to~~) **EE Classification.** Electrically powered trucks that have, in addition to all of the requirements for the E and ES type trucks, have their electric motors and all other electrical equipment completely enclosed.

(7) (~~"EX" refers to~~) **EX Classification.** Electrically powered trucks that differ from E, ES, or EE type trucks in that the electrical fittings and equipment are so designed, constructed, and assembled to be used in atmospheres containing flammable vapors or dusts.

(8) (~~"G" refers to~~) **G Classification.** Gasoline powered trucks that have minimum acceptable safeguards against inherent fire hazards.

(9) (~~"GS" refers to~~) **GS Classification.** Gasoline powered trucks with additional safeguards to the exhaust, fuel, and electrical systems.

(10) (~~"LP" refers to~~) **LP Classification.** Liquefied petroleum gas-powered trucks that have minimum acceptable safeguards against inherent fire hazards.

(11) (~~"LPS" refers to~~) **LPS Classification.** LP-gas powered trucks that in addition to meeting the requirements for LP trucks, are provided with additional safeguards to the exhaust, fuel, and electrical systems.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-52009 (~~What~~) The employer must consider the following 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.

AMENDATORY SECTION (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

WAC 296-307-52011 (~~What~~) Requirements for determining which trucks to use in specific hazardous environments(?) Following are the minimum truck types required in specific hazardous environments. (~~You~~) **The employer** may choose to use industrial trucks having greater safeguards. Tables W-1 and W-2 give specific vehicle usage information by Group and Class.

TABLE W-1
SUMMARY TABLE ON USE OF INDUSTRIAL TRUCKS IN VARIOUS LOCATIONS

CLASSES (Description of classes)	GROUPS (Examples of locations or atmosphere in classes and groups)	DIVISIONS (Nature of hazardous conditions)
UNCLASSIFIED	No group designations in Unclassified	No divisions in Unclassified
Locations not possessing atmospheres as described in other columns.	Piers and wharves inside and outside general storage, general industrial or commercial properties	

CLASSES (Description of classes)	GROUPS (Examples of locations or atmosphere in classes and groups)				DIVISIONS (Nature of hazardous conditions)	
	A	B	C	D	1	2
CLASS I LOCATIONS Locations in which flammable gases or vapors are, or may be, present in the air in quantities sufficient to produce explosive or ignitable mixtures.	Acetylene	Hydrogen	Ethyl ether	Gasoline Naphtha Alcohols Acetone Lacquer solvent Benzene	Conditions exists continuously, intermittently, or periodically under normal operating conditions.	Condition may occur due to accidentally, for example, due to a puncture of a storage drum.
CLASS II LOCATIONS Locations which are hazardous because of the presence of combustible dust.	E Metal dust	F Carbon black Coal dust Coke dust	G Grain dust Flour dust Starch dust Organic dust		Explosive mixture may be present under normal operating conditions, or where failure of equipment may cause the condition to exist simultaneously with arcing or sparking of electrical equipment, or where dusts of an electrically conducting nature may be present.	Explosive mixture not normally present, but where deposits of dust may cause heat rise in electrical equipment, or where such deposits may be ignited by arcs or sparks from electrical equipment.
CLASS III LOCATIONS Locations where easily ignitable fibers or flyings are present but not likely to be in suspension in quantities sufficient to produce ignitable mixtures.	Class III has no groups				1 Locations in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.	2 Locations in which easily ignitable fibers are stored or handled (except in the process of manufacture).

TABLE W-2
AUTHORIZED USES OF TRUCKS BY TYPES IN GROUPS OF CLASSES AND DIVISIONS

Groups in classes	UNCLASSIFIED	CLASS I								CLASS II						CLASS III	
		DIV I				DIV II				DIV I			DIV II			DIV I	DIV II
		A	B	C	D	A	B	C	D	E	F	G	E	F	G		
Type of truck authorized:	None															None	None
<i>Diesel:</i>																	
Type D.....	D**...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Type DS.....	.....	...	...	...	...	...	...	...	DS...	...	...	...	...	...	DS...	...	DS
Type DY.....	.....	...	...	...	...	...	...	...	DY...	...	...	...	...	...	DY...	...	DY
<i>Electric:</i>																	
Type E.....	E**...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	E
Type ES.....	.....	...	...	...	...	...	...	...	ES...	...	...	...	...	...	ES...	...	ES
Type EE.....	.....	...	...	...	...	...	...	...	EE...	...	...	...	...	...	EE...	EE...	EE
Type EX.....	.....	...	...	...	EX...	...	...	...	EX...	...	EX...	EX...	...	...	EX...	EX...	EX
<i>Gasoline:</i>																	
Type G.....	G**...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Type GS.....	.....	...	...	...	...	...	...	...	GS...	...	...	...	...	...	GS...	...	GS
<i>LP-Gas:</i>																	
Type LP.....	LP**...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Type LPS.....	...	...	...	...	...	...	...	...	LPS...	...	...	...	...	...	LPS...	...	LPS

** Trucks conforming to these types may also be used.

(1) Powered industrial trucks are prohibited in atmospheres with a hazardous concentration of:

- (*) (a) Acetaldehyde(7);
- (*) (b) Acetylene(7);
- (*) (c) Butadiene(7);
- (*) (d) Cyclopropane(7);
- (*) (e) Diethyl ether(7);
- (*) (f) Ethylene(7);
- (*) (g) Ethylene oxide(7);

(*) (h) Hydrogen (or gases or vapors equivalent in hazard to hydrogen, such as manufactured gas)(7);

(*) (i) Isoprene(7);

(*) (j) Propylene oxide(7); or

(*) (k) Unsymmetrical dimethyl hydrazine (UDMH).

((*) (i) Only approved EX trucks, or other trucks approved by the manufacturer, may be used in atmospheres containing hazardous concentrations of metal dust, including:

(*) (A) Aluminum, magnesium, and their commercial alloys;

((*) (B) Other dusts of similarly hazardous characteristics; or

((*) (C) In atmospheres containing:

((=) (I) Carbon black(⌘);

((=) (II) Coal(⌘); or

((=) (III) Coke dust.

((=)) (ii) 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) Only approved EX trucks, or other trucks approved by the manufacturer, may be used in atmospheres containing:

((*) (a) Acetone(⌘);

((*) (b) Acrylonitrile(⌘);

((*) (c) Alcohol(⌘);

((*) (d) Ammonia(⌘);

((*) (e) Benzine(⌘);

((*) (f) Benzol(⌘);

((*) (g) Butane(⌘);

((*) (h) Ethylene dichloride(⌘);

((*) (i) Gasoline(⌘);

((*) (j) Hexane(⌘);

((*) (k) Lacquer solvent vapors(⌘);

((*) (l) Naphtha(⌘);

((*) (m) Natural gas(⌘);

((*) (n) Propane(⌘);

((*) (o) Propylene(⌘);

((*) (p) Styrene(⌘);

((*) (q) Vinyl acetate(⌘);

((*) (r) Vinyl chloride(⌘); or

((*) (s) Xylenes;

in quantities sufficient to produce explosive or ignitable mixtures.

(3) Only approved DY, EE, or EX trucks, or other trucks approved by the manufacturer, may 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.

Only approved DY, EE, or EX trucks, or other trucks approved by the manufacturer, 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) Only approved DS, ES, GS, or LPS trucks, or other trucks approved by the manufacturer, may 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) Only approved EX trucks, or other trucks approved by the manufacturer, may 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, or other trucks approved by the manufacturer as having equal or greater safeguards, usually includes the working areas of:

((*) (i) Grain handling and storage plants(⌘);

((*) (ii) Rooms containing grinders or pulverizers(⌘);

((*) (iii) Cleaners(⌘);

((*) (iv) Graders(⌘);

((*) (v) Scalpers(⌘);

((*) (vi) Open conveyors or spouts(⌘);

((*) (vii) Open bins or hoppers(⌘);

((*) (viii) Mixers or blenders(⌘);

((*) (ix) Automatic or hopper scales(⌘);

((*) (x) Packing machinery(⌘);

((*) (xi) Elevator heads and boots(⌘);

((*) (xii) Stock distributors(⌘);

((*) (xiii) Dust and stock collectors (except all-metal collectors vented to the outside), and all similar dust producing machinery and equipment in:

((=) (A) Grain processing plants(⌘);

((=) (B) Starch plants(⌘);

((=) (C) Sugar pulverizing plants(⌘);

((=) (D) Malting plants(⌘);

((=) (E) Hay grinding plants, and other similar locations; and(⌘)

((=) (F) Areas where combustible dust may, under normal operating conditions, be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

(5) Only approved DY, EE, or EX trucks, or other trucks approved by the manufacturer, may 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) Only approved DY, EE, or EX trucks, or other trucks approved by the manufacturer, may 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) Only approved DS, DY, ES, EE, EX, GS, or LPS trucks, or other trucks approved by the manufacturer, may 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, or other truck approved by the manufacturer, must be used. If not classified as hazardous, any approved D, E, G, or LP truck, or other truck approved by the manufacturer, may be used, or trucks meeting the requirements for these types may be used.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-52013 (~~(In what environments may)~~) **Using 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

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).

AMENDATORY SECTION (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

WAC 296-307-52019 (~~(What)~~) **Requirements that apply to fuel handling and storage** (~~(?)~~). (1) (~~(Y00)~~) The employer 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. 30-1996).

(2) (~~(Y00)~~) The employer must ensure that LP-gas fuel is stored and handled according to NFPA Storage and Handling of Liquefied Petroleum Gases (NFPA No. 58-1998).

AMENDATORY SECTION (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

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, ANSI/IES RP-7 1990.)

(2) Where general lighting is inadequate, directional lighting must be provided on the truck.

AMENDATORY SECTION (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

WAC 296-307-52023 (~~(What level of)~~) **Carbon monoxide gas** (~~(is allowed?)~~) **levels**. Concentration levels of carbon monoxide gas created by truck operations must not exceed the levels specified in WAC 296-62-075, Part L (general occupational health standards).

Note: Questions concerning degree of concentration and methods of sampling should be referred to a qualified industrial hygienist.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

WAC 296-307-52029 (~~What are the~~) Operator training requirements for powered industrial trucks(?)₂
(1) Safe operation.

(a) The employer must ensure that each powered industrial truck operator is trained in the safe operation of a powered industrial truck, and is competent to operate a powered industrial truck safely.

(b) Prior to permitting an employee to operate a powered industrial truck (except for training purposes), the employer must ensure that each operator has successfully completed the training required by this section.

(2) Training program implementation.

(a) Trainees may operate a powered industrial truck only under the direct supervision of persons who have the knowledge, training, and experience to train operators and where such operation does not endanger the trainee or other employees.

Note: The employer, or any other qualified person of the employer's choosing, may give required training and evaluation.

(b) Training must consist of formal instruction and/or practical training, conveyed in a manner that the trainee understands.

Note: Formal instruction may include lecture, discussion, interactive computer learning, video tape and/or written material. Practical training may include demonstrations performed by the trainer and practical exercises performed by the trainee.

(3) Training program content. Powered industrial truck operators must receive initial training in the topics that follow, except in topics that the employer can demonstrate are not applicable to safe operation of the truck in the employer's workplace.

(a) Truck-related topics:

((*) (i) Operating instructions, warnings and precautions for the types of truck the operator will be authorized to operate;

((*) (ii) Differences between the truck and the automobile;

((*) (iii) Truck controls and instrumentation: Where they are located, what they do, and how they work;

((*) (iv) Engine or motor operation;

((*) (v) Steering and maneuvering;

((*) (vi) Visibility (including restrictions due to loading);

((*) (vii) Fork and attachment adaption, operation, and use limitations;

((*) (viii) Vehicle capacity;

((*) (ix) Vehicle stability;

((*) (x) Any vehicle inspection and maintenance that the operator will be required to perform;

((*) (xi) Refueling and/or charging and recharging of batteries;

((*) (xii) Operating limitations;

((*) (xiii) Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of vehicle that the employee is being trained to operate.

(b) Workplace-related topics:

((*) (i) Surface conditions where the vehicle will be operated;

((*) (ii) Composition of loads to be carried and load stability;

((*) (iii) Load manipulation, stacking, and unstacking;

((*) (iv) Pedestrian traffic in areas where the vehicle will be operated;

((*) (v) Narrow aisles and other restricted places where the vehicle will be operated;

((*) (vi) Hazardous (classified) locations where the vehicle will be operated;

((*) (vii) Ramps and other sloped surfaces that could affect the vehicle's stability;

((*) (viii) Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a buildup of carbon monoxide or diesel exhaust;

((*) (ix) Other unique or potentially hazardous environmental conditions in the workplace that could affect safe operation.

(4) Retraining.

(a) Retraining in relevant topics must be provided to the operator when:

((*) (i) The operator has been observed to operate the vehicle in an unsafe manner;

((*) (ii) The operator has been involved in an accident or near-miss incident;

((*) (iii) The operator has received an evaluation that reveals that the operator is not operating the truck safely;

((*) (iv) The operator is assigned to drive a different type of truck; or

((*) (v) The condition in the workplace changes in a manner that could affect safe operation of the truck.

(b) Retraining must be provided to an operator if three years has elapsed since he or she last received training.

(5) Avoidance of duplicative training. If an operator has previously received training in a topic specified in subsection (3) of this section, and such training is appropriate to the truck and working conditions encountered, additional training in that topic is not required if the operator can provide proof of such training within three years, and the employer can verify operator competency.

(6) Recordkeeping. Employers must keep records showing that each operator has been trained or received retraining as required by this section. These records must include the name of the operator, the date of the training or retraining, and the name of the person(s) giving the training or retraining.

(7) Implementation dates. The employer must ensure that operators of powered industrial trucks are trained, as appropriate, by the effective date of this section. Employees hired on or after the effective date of this section must be trained and found competent prior to being assigned to operate a powered industrial truck.

(8) Nonmandatory guidance. To assist employers in implementing operator training requirements, a nonmandatory appendix has been added as WAC 296-307-52030. This appendix does not add to, alter, or reduce the requirements of this section.

AMENDATORY SECTION (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

WAC 296-307-52030 ((Is there any) Additional (nonmandatory) information that may assist ((me) with powered industrial truck operator training(=?)). (1) **Definitions.** The following definitions may help to explain the principle of stability:

((=))Center of gravity((= means)). The point on an object at which all of the object's weight is concentrated. For symmetrical loads, the center of gravity is at the middle of the load.

((=))Counterweight((= means)). The weight that is built into the truck's basic structure and is used to offset the load's weight and to maximize the vehicle's resistance to tipping over.

((=))Fulcrum((= means)). The truck's axis of rotation when it tips over.

((=))Grade((= means)). The slope of a surface, which is usually measured as the number of feet of rise or fall over a hundred foot horizontal distance (the slope is expressed as a percent).

((=))Lateral stability((= means)). A truck's resistance to overturning sideways.

((=))Line of action((= means)). An imaginary vertical line through an object's center of gravity.

((=))Load center((= means)). The horizontal distance from the load's edge (or the fork's or other attachment's vertical face) to the line of action through the load's center of gravity.

((=))Longitudinal stability((= means)). The truck's resistance to overturning forward or rearward.

((=))Moment((= means)). The product of the object's weight times the distance from a fixed point (usually the fulcrum). In the case of a powered industrial truck, the distance is measured from the point at which the truck will tip over to the object's line of action. The distance is always measured perpendicular to the line of action.

((=))Track((= means)). The distance between the wheels on the same axle of the truck.

((=))Wheelbase((= means)). The distance between the centerline of the vehicle's front and rear wheels.

(2) General.

(a) Determining the stability of a powered industrial truck is simple once a few basic principles are understood. There are many factors that contribute to a vehicle's stability: The vehicle's wheelbase, track, and height; the load's weight distribution; and the vehicle's counterweight location (if the vehicle is so equipped).

(b) The "stability triangle," used in most stability discussions, demonstrates stability simply (see Figures 1 and 2).

(3) Basic principles.

(a) Whether an object is stable depends on the object's "moment" (see definitions, this section) at one end of a system being greater than, equal to, or smaller than the object's moment at the system's other end. This principle can be seen in the way a seesaw or teeter-totter works: That is, if the product of the load and distance from the fulcrum (moment) is equal to the moment at the device's other end, the device is balanced and it will not move. However, if there is a greater

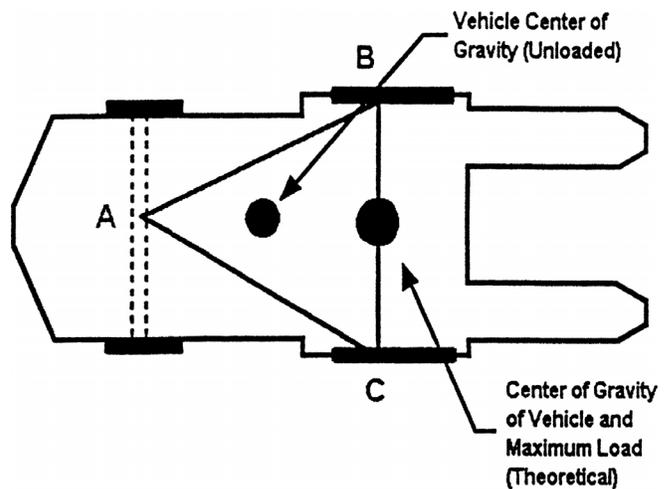
moment at one end of the device, the device will try to move downward at the end with the greater moment.

(b) The longitudinal stability of a counterbalanced powered industrial truck depends on the vehicle's moment and the load's moment. In other words, if the mathematic product of the load-moment (the distance from the front wheels, the approximate point at which the vehicle would tip forward) to the load's center of gravity times the load's weight is less than the vehicle's moment, the system is balanced and will not tip forward. However, if the load's moment is greater than the vehicle's moment, the greater load-moment will force the truck to tip forward.

(4) The stability triangle.

(a) Almost all counterbalanced powered industrial trucks have a three-point suspension system, that is, the vehicle is supported at three points. This is true even if the vehicle has four wheels. The truck's steer axle is attached to the truck by a pivot pin in the axle's center. When the points are connected with imaginary lines, this three-point support forms a triangle called the stability triangle. Figure 1 depicts the stability triangle.

Figure 1



Notes:

1. When the vehicle is loaded, the combined center of gravity shifts toward line B-C. Theoretically, the maximum load will result in the center of gravity at the line B-C. In actual practice, the combined center of gravity should never be at line B-C.
2. The addition of additional counterweight will cause the truck center of gravity to shift toward point A and result in a truck that is less stable laterally.

(b) When the vehicle's line of action, or load center, falls within the stability triangle, the vehicle is stable and will not tip over. However, when the vehicle's line of action or the vehicle/load combination falls outside the stability triangle, the vehicle is unstable and may tip over.

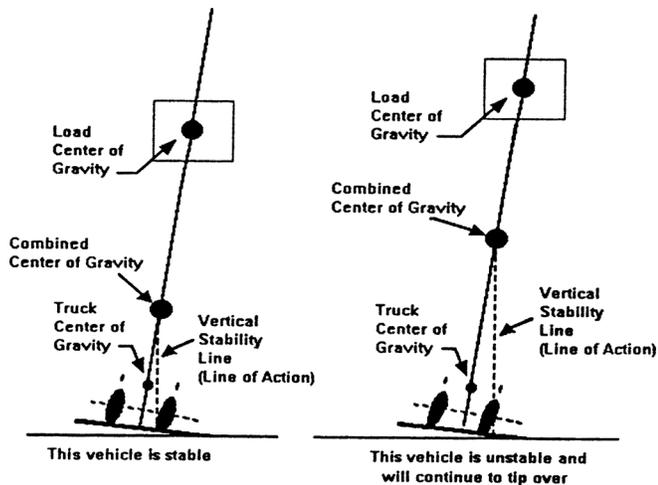


Figure 2

(5) Longitudinal stability.

(a) The axis of rotation when a truck tips forward is the front wheels' points of contact with the pavement. When a powered industrial truck tips forward, the truck will rotate about this line. When a truck is stable, the vehicle-moment must exceed the load-moment. As long as the vehicle-moment is equal to or exceeds the load-moment, the vehicle will not tip over. On the other hand, if the load-moment slightly exceeds the vehicle-moment, the truck will begin to tip forward, thereby causing the rear to lose contact with the floor or ground and resulting in loss of steering control. If the load-moment greatly exceeds the vehicle-moment, the truck will tip forward.

(b) To determine the maximum safe load-moment, the truck manufacturer normally rates the truck at a maximum load at a given distance from the front face of the forks. The specified distance from the front face of the forks to the line of action of the load is commonly called the load center. Because larger trucks normally handle loads that are physically larger, these vehicles have greater load centers. Trucks with a capacity of 30,000 pounds or less are normally rated at a given load weight at a 24-inch load center. Trucks with a capacity greater than 30,000 pounds are normally rated at a given load weight at a 36- or 48-inch load center. To safely operate the vehicle, the operator should always check the data plate to determine the maximum allowable weight at the rated load center.

(c) Although the true load-moment distance is measured from the front wheels, this distance is greater than the distance from the front face of the forks. Calculating the maximum allowable load-moment using the load-center distance always provides a lower load-moment than the truck was designed to handle. When handling unusual loads, such as those that are larger than 48 inches long (the center of gravity is greater than 24 inches) or that have an offset center of gravity, etc., a maximum allowable load-moment should be calculated and used to determine whether a load can be safely handled. For example, if an operator is operating a 3,000-pound capacity truck (with a 24-inch load center), the maximum allowable load-moment is 72,000 inch-pounds (3,000 times

24). If a load is 60 inches long (30-inch load center), then the maximum that this load can weigh is 2,400 pounds (72,000 divided by 30).

(6) Lateral stability.

(a) The vehicle's lateral stability is determined by the line of action's position (a vertical line that passes through the combined vehicle's and load's center of gravity) relative to the stability triangle. When the vehicle is not loaded, the truck's center of gravity location is the only factor to be considered in determining the truck's stability. As long as the line of action of the combined vehicle's and load's center of gravity falls within the stability triangle, the truck is stable and will not tip over. However, if the line of action falls outside the stability triangle, the truck is not stable and may tip over. Refer to Figure 3.

(b) Factors that affect the vehicle's lateral stability include the load's placement on the truck, the height of the load above the surface on which the vehicle is operating, and the vehicle's degree of lean.

(7) Dynamic stability.

(a) Up to this point, the stability of a powered industrial truck has been discussed without considering the dynamic forces that result when the vehicle and load are put into motion. The weight's transfer and the resultant shift in the center of gravity due to the dynamic forces created when the machine is moving, braking, cornering, lifting, tilting, and lowering loads, etc., are important stability considerations.

(b) When determining whether a load can be safely handled, the operator should exercise extra caution when handling loads that cause the vehicle to approach its maximum design characteristics. For example, if an operator must handle a maximum load, the load should be carried at the lowest position possible, the truck should be accelerated slowly and evenly, and the forks should be tilted forward cautiously. However, no precise rules can be formulated to cover all of these eventualities.

AMENDATORY SECTION (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

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) Employers must not allow people to ride on powered industrial trucks unless a safe place to ride is provided.

(4) Employers must prohibit employees from placing any body parts 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.

(9) An active operator protection restraint device (such as a seatbelt or lap-bar) or system must be used, when provided.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-52033 (~~When may~~) Use of 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

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.

(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.

(10) Access to fire aisles, stairways, and fire equipment must be kept clear.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

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.

AMENDATORY SECTION (Amending WSR 00-01-176, filed 12/21/99, effective 3/1/00)

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)) must 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.
- (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) 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)) The employer 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.

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-53001 (~~What does this section cover?~~) **Scope.** 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."

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-53003 (~~What~~) **Definitions that apply to rim wheel servicing**(~~?~~). (~~1~~) **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.

(~~2~~) **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 contained in the charts that is applicable to the types of wheels being serviced.

(~~3~~) **Demounting.** The opposite of mounting.

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 assembly 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~~) **Removing.** The opposite of installing.

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.

(~~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 assembly of tire, tube and liner (where appropriate), and wheel components.

(~~10~~) **Service**(~~""~~) or (~~11~~) **servicing**(~~"means"~~). The mounting and demounting of rim wheels, and related activi-

ties such as inflating, deflating, installing, removing, and handling.

(~~12~~) **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.

(~~13~~) **Single-piece rim wheel**(~~"means"~~). The assembly of single-piece rim wheel with the tire and other components.

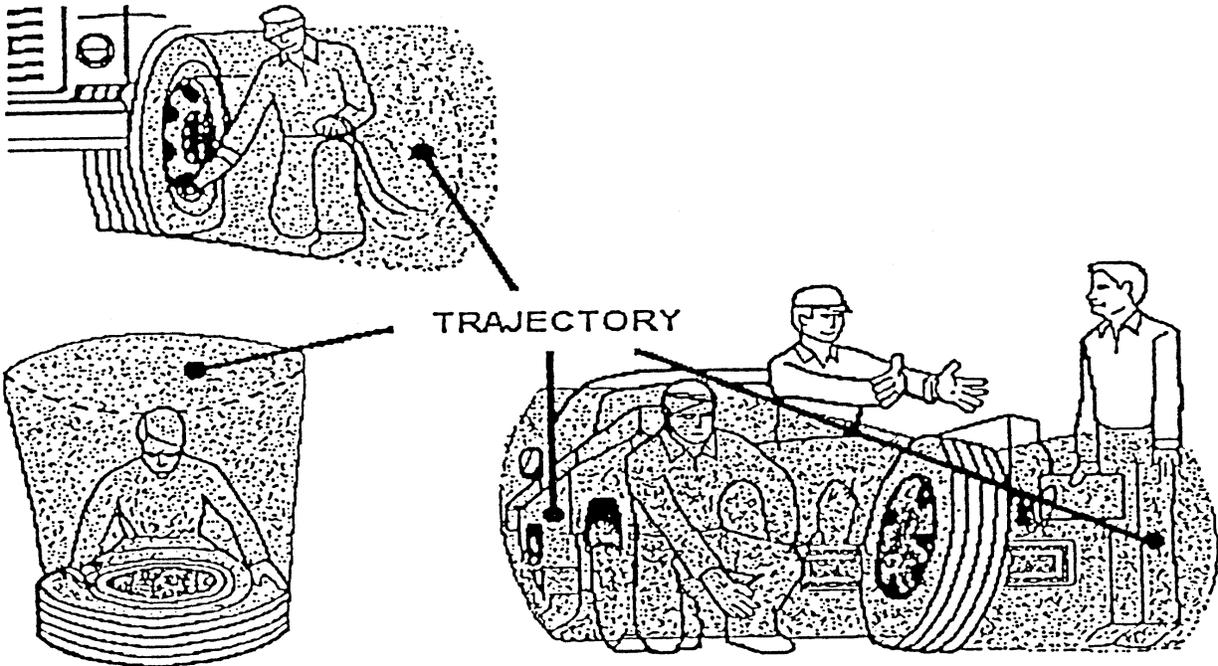
(~~14~~) **Single-piece wheel**(~~"means"~~). A vehicle wheel consisting of one part, designed to hold the tire on the wheel when the tire is inflated.

(~~15~~) **Trajectory**(~~"means"~~):

(~~16~~) (a) Any potential path that a rim wheel component may travel during an explosive separation, or the sudden release of the pressurized air; or

(~~17~~) (b) 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.)



(2) 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).

AMENDATORY SECTION (Amending WSR 98-24-096, filed 12/1/98, effective 3/1/99)

WAC 296-307-53005 (What) Employer provided training (must an employer provide) for employees who service rim wheels(2). (1) ~~(You)~~ The employer 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)~~ The employer 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)~~ the employer believes that any employee is unable to read and understand the charts or rim manual, ~~(you)~~ the employer must instruct the employee in the contents of the charts and rim manual in a manner that the employee can understand.

(4) ~~(You)~~ The employer must evaluate each employee's ability to perform these tasks safely, and provide additional training as necessary to ensure that each employee maintains proficiency.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-53007 (What requirements apply to) Restraining devices(2). (1) ~~(You)~~ The employer must furnish a restraining device for inflating tires on multipiece wheels.

(2) ~~(You)~~ The employer 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 regis-

tered professional engineer to meet the strength requirements of (a) of this subsection.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-53009 (~~What other~~) Equipment (~~must~~) an employer must provide for rim wheel servicing(?), (1) (~~You~~) The employer 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~~) must be available in the service area.

(4) (~~You~~) The employer 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-53011 (~~What requirements apply to~~) Wheel component assembly(?), (1) (~~You~~) The employer 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~~) must 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-53013 (~~What are the~~) Safe operating procedures for servicing multipiece rim wheels(?), (~~You~~) The employer must establish safe operating procedures for servicing multipiece rim wheels, and ensure that employees are instructed in and follow the procedures. (~~Your~~) The employer's 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~~) must 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-53015 (~~What are the~~) Safe operating procedures for servicing single-piece rim wheels(?), (~~You~~) The employer must establish safe operating procedures for servicing single-piece rim wheels, and ensure that employees are instructed in and follow the procedures. (~~Your~~) The employer's 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.

AMENDATORY SECTION (Amending WSR 97-09-013, filed 4/7/97, effective 4/7/97)

WAC 296-307-53017 ((How can an employer order) Ordering the OSHA charts(?)) OSHA charts are available through OSHA area offices. ((You)) The employer 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, Occupational Safety and Health Administration. Single copies are available without charge.

If ((you want)) the employer wants multiple copies of these charts, ((you)) the employer may order them from the Publications Office, U.S. Department of Labor, Room N3101, Washington, D.C. 20210. Telephone: (((202)-523-9667)) 202-523-9667.

AMENDATORY SECTION (Amending WSR 01-17-033, filed 8/8/01, effective 9/1/01)

WAC 296-307-570 Lighting rule. ((Your)) Employer responsibility: To provide ((an)) and maintain adequate lighting in ((your)) the workplace.

AMENDATORY SECTION (Amending WSR 01-17-033, filed 8/8/01, effective 9/1/01)

WAC 296-307-57005 Provide and maintain adequate lighting.

Note: This section establishes minimal levels of lighting 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.

((You must:

•)) (1) The employer must provide and maintain adequate lighting for all work activities in ((your)) the workplace. See the following table.

Lighting Table		
Activity	Minimum Acceptable average lighting level in an area: (Foot-candles)	Any one single measurement used to determine the average lighting level* cannot be less than: (Foot-candles)
Indoor task	10	5
Outdoor task	5	2.5
Nontask activities for both indoor and outdoor	3	1.5

((Lighting levels must be measured at thirty inches above the floor/working)) surface or at the task.

*

((You must:

•)) (2) The employer must have adequate light for employees to see nearby objects that might be potential hazards or to see to operate emergency controls or other equipment, if general lighting is not available.

Notes: ((•)) 1. Lighting levels can be measured with a light meter.
((•)) 2. Conversion information: 1 foot candle = 1 lumen incident per square foot = 10.76 lux.

AMENDATORY SECTION (Amending WSR 06-22-023, filed 10/24/06, effective 12/1/06)

WAC 296-307-590 Environmental tobacco smoke in the office—Summary.

((Your)) Employer responsibility:

To eliminate exposure to environmental tobacco smoke in ((your)) the office work environment,

((You must:))

The employer must prohibit tobacco smoke in ((your)) the office work environment.

WAC 296-307-59005

Note: This rule does not preempt any federal, state, municipal, or other local authority's regulation of indoor smoking that is more protective than this section.

Definitions: **Office work environment ((is))** An indoor or enclosed occupied space where clerical work, administration, or business is carried out.

In addition, it includes:

- ((•)) a. Other workplace spaces controlled by the employer and used by office workers, such as cafeterias, meeting rooms, and washrooms.
- ((•)) b. Office areas of manufacturing and production facilities, not including process areas.
- ((•)) c. Office areas of businesses such as food and beverage establishments, agricultural operations, construction, commercial trade, services, etc.

Smoking. A person is smoking if they are:

- ((•)) a. Lighting up;
- ((•)) b. Inhaling;
- ((•)) c. Exhaling;

~~((*)~~ d. Carrying a pipe, cigar or cigarette of any kind that is burning.

Link: For work environments outside the office, contact ~~((your))~~ the local health department using the link <http://www.secondhandsmokesyou.com> or by calling them directly.

AMENDATORY SECTION (Amending WSR 06-22-023, filed 10/24/06, effective 12/1/06)

WAC 296-307-59005 Prohibit tobacco smoke in ~~((your))~~ the office work environment.

Exemption: The minimum criteria specified in this rule do not apply to outdoor structures provided for smokers such as gazebos or lean-tos that maintain the twenty-five-foot distance from entrances, exits, windows that open, and ventilation intakes that serve an enclosed area where smoking is prohibited.

~~((You must:))~~

(1) The employer must prohibit smoking in ~~((your))~~ the office work environment.

(2) The employer must use administrative controls to prevent tobacco smoke from entering ~~((your))~~ the office from outside the building.

~~((*)~~ (3) The employer must make sure that outside smoking areas used by ~~((your))~~ their employees are at least twenty-five feet from entrances, exits, windows that open, and ventilation intakes that serve an enclosed area where smoking is prohibited.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-594 Scope. This part applies to all use of respirators at work.

IMPORTANT:

Before ~~((you))~~ the employer decides to use respirators, ~~((you are))~~ the employer is required to evaluate respiratory hazards and implement control methods as outlined in WAC 296-307-624 through 296-307-628, Respiratory hazards.

The term "respiratory hazards" will be used throughout this part to refer to oxygen deficient conditions and harmful airborne hazards.

Definition:

Respirators ~~((are))~~. A type of personal protective equipment designed to protect the wearer from respiratory hazards.

~~((You))~~ The employer can use Table 1 for general guidance on which sections apply ~~((to you))~~.

Table 1
Sections That Apply to ~~((your))~~ the Employer's Workplace

If employees...	Then the sections marked with an "X" apply...					
	596	598	600	602-618	620	622
Request and are permitted to voluntarily use filtering-facepiece respirators, and are not exposed to a respiratory hazard		X				X
Request and are permitted to voluntarily use respirators that are NOT filtering-facepiece respirators, and are not exposed to a respiratory hazard	X	X			X	X
Are required to use any respirator by WISHA or the employer	X		X	X	X	X
Would use an escape respirator in an emergency	X		X	X	X	X

Reference: See WAC 296-307-100, Personal protective equipment (PPE) to find requirements for other types of personal protective equipment (PPE), such as eye, hand, and head protection.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-596 Respirator program administrator.

~~((Your))~~ **Employer responsibility:**

To make sure a capable individual is in charge of respirator program development and management.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-59605 Designate a program administrator.

Exemption: ~~((You do))~~ The employer does not need to designate a program administrator if employees use only filtering-facepiece respirators and do so only as voluntary use.

Definition:

Voluntary use ~~((is))~~. Respirator use that is requested by the employee AND permitted by the employer when NO respiratory hazard exists.

~~((You must:))~~

~~((*)~~) The employer must designate a program administrator who has overall responsibility for ~~((your))~~ the employer's program and has sufficient training or experience to:

~~((-))~~ (1) Oversee program development and coordinate implementation.

~~((-))~~ (2) Conduct required evaluations of program effectiveness outlined in WAC 296-307-60005.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-598 Voluntary respirator use requirements.

~~((You))~~ **Employer responsibility:**

To make sure voluntary use of respirators by employees does not create job safety or health hazards.

~~((You must:~~

~~Make sure voluntary use of respirators is safe
WAC 296-307-59805~~

~~Keep voluntary use respirator program records
WAC 296-307-59810.))~~

The employer must meet the requirements...	in this section:
Make sure voluntary use of respirators is safe.	WAC 296-307-59805
Keep voluntary use respirator program records.	WAC 296-307-59810

IMPORTANT:

(*) 1. Respirator use is NOT voluntary if a respiratory hazard, such as exposure to a substance over the permissible exposure limit (PEL) or hazardous exposure to an airborne biological hazard, is present.

(*) 2. To evaluate respiratory hazards in ~~((you))~~ the employer's workplace, see WAC 296-307-624(~~(, Respiratory hazards))~~ Scope.

(*) 3. Some requirements in this section do not apply if only filtering-facepiece respirators are used voluntarily. Some filtering-facepiece respirators are equipped with a sorbent layer for absorbing "nuisance" organic vapors. These can be used for voluntary use, but are not NIOSH certified for protection against hazardous concentrations of organic vapor.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-59805 Make sure voluntary use of respirators is safe.

Definition:

Voluntary use ~~((is))~~ Respirator use that is requested by the employee AND permitted by the employer when NO respirator hazard exists.

IMPORTANT:

If ~~((you))~~ the employer chooses to require respirator use, use is NOT voluntary and the required use sections of this part apply.

~~((You must:))~~

(1) The employer must make sure voluntary respirator use does NOT:

(*) (a) Interfere with an employee's ability to work safely, such as restricting necessary vision or radio communication;

OR

(*) (b) Create health hazards.

Notes: Examples of health hazards include:

(*) 1. Skin irritation, dermatitis, or other health effects caused by using a dirty respirator;

(*) 2. Illness created by sharing contaminated respirators;

(*) 3. Health effects caused by use of an unsafe air supply, such as carbon monoxide poisoning.

~~((You must:))~~

(2) The employer must provide all voluntary respirator users with the advisory information in Table 2 at no cost to them.

Note: If ~~((you have provided))~~ employees ~~((with))~~ are provided the advisory information required in the previous section, WAC 296-307-598, ~~((you do))~~ the employer does not need to provide the additional information in Table 2 to those employees.

~~((You must:))~~

(3) The employer must develop and maintain a written program that includes the following:

(*) (a) Medical evaluation provisions as specified in WAC 296-307-604.

(*) (b) Procedures to properly clean and disinfect respirators, according to WAC 296-307-62015, if they are reused.

(*) (c) How to properly store respirators, according to WAC 296-307-61010, so that using them does not create hazards.

(*) (d) Procedures to make sure there is a safe air supply, according to WAC 296-307-616, when using air-line respirators and SCBAs.

(*) (e) Training according to WAC 296-307-608 when necessary to ensure respirator use does NOT create a hazard.

Notes: (*) 1. Pay for medical evaluations, training, travel related costs, and wages. ~~((You do))~~ The employer does NOT need to pay for respirators employees use only voluntarily.

(*) 2. If ~~((you have))~~ the employer has both voluntary and required respirator users, ~~((you))~~ the employer may choose to treat voluntary users as required users. Doing this exceeds the requirements in this section.

Exemption: If employees use only filtering-facepiece respirators and do so only voluntarily, ~~((you do))~~ the employer does not need to develop and maintain a written program.

Use Table 2 to provide information to employees who voluntarily use any type of respirator.

Table 2

Advisory Information for Employees Who Voluntarily Use Respirators
<ul style="list-style-type: none"> Respirators protect against airborne hazards when properly selected and used. WISHA recommends voluntary use of respirators when exposure to substances is below WISHA permissible exposure limits (PELs) because respirators can provide ((you)) <u>employees</u> an additional level of comfort and protection. If ((you)) <u>the employee</u> chooses to voluntarily use a respirator (whether it is provided by ((you or your)) <u>the employee</u> or by <u>the employer</u>) be aware that respirators can create hazards for ((you)) <u>the user</u>. ((You)) <u>Employees</u> can avoid these hazards if ((you)) <u>they</u> know how to use ((you)) <u>the</u> respirator properly AND how to keep it clean. Take these steps: <ul style="list-style-type: none"> Read and follow all instructions provided by the manufacturer about use, maintenance (cleaning and care), and warnings regarding the respirator's limitations.

Advisory Information for Employees Who Voluntarily Use Respirators

- Choose respirators that have been certified for use to protect against the substance of concern. The National Institute for Occupational Safety and Health (NIOSH) certifies respirators. If a respirator is not certified by NIOSH, ~~((you))~~ employees have no guarantee that it meets minimum design and performance standards for workplace use.

- A NIOSH approval label will appear on or in the respirator packaging. It will tell ~~((you))~~ the employee and employer what protection the respirator provides.

- The employee should keep track of ~~((your))~~ respirator so ~~((you do))~~ the employee does not mistakenly use someone else's.

- **DO NOT** wear ~~((your))~~ the respirator into:

- Atmospheres containing hazards that ~~((your))~~ the respirator is not designed to protect against.

For example, a respirator designed to filter dust particles will not protect ~~((you))~~ against solvent vapor, smoke or oxygen deficiency.

- Situations where respirator use is required.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-59810 Keep voluntary use program records.

Exemption: If employees use only filtering-facepiece respirators voluntarily, ~~((you do))~~ the employer does not need to follow these recordkeeping requirements.

~~((You must:))~~

~~(*)~~ (1) The employer must keep copies of:

~~((You))~~ (a) The current written respirator program;

~~(-)~~ (b) Written recommendations from the LHCP;

~~(*)~~ (2) The employer must allow records required by this section to be examined and copied by affected employees and their representatives.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-600 Written respirator program and recordkeeping.

~~((You))~~ **Employer responsibility:**

To develop, implement, and maintain a written program that provides clear instruction for safe and reliable respirator use.

~~((You must:))~~

~~Develop and maintain a written program~~

~~WAC 296-307-60005~~

~~Keep respirator program records~~

~~WAC 296-307-60010.)~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Develop and maintain a written program.</u>	<u>WAC 296-307-60005</u>
<u>Keep respirator program records.</u>	<u>WAC 296-307-60010</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-60005 Develop and maintain a written program.

Exemption: This section does **NOT** apply to respirator use that is voluntary. See WAC 296-307-59805 for voluntary use program requirements.

~~((You must:))~~

(1) The employer must develop a complete worksite-specific written respiratory protection program that includes the applicable elements listed in Table 3.

Note: Pay for respirators, medical evaluations, fit testing, training, maintenance, travel costs, and wages.

~~((You must:))~~

(2) The employer must keep ~~((your))~~ its program current and effective by evaluating it and making corrections. Do ALL of the following:

~~(*)~~ (a) Make sure procedures and program specifications are followed and appropriate.

~~(*)~~ (b) Make sure selected respirators continue to be effective in protecting employees. For example(~~(:~~

~~-))~~, if changes in work area conditions, level of employee exposure, or employee physical stress have occurred, ~~((you need))~~ the employer needs to reevaluate ~~((your))~~ respirator selection.

~~(*)~~ (c) Have supervisors periodically monitor employee respirator use to make sure employees are using them properly.

~~(*)~~ (d) Regularly ask employees required to use respirators about their views concerning program effectiveness and whether they have problems with:

~~((-))~~ (i) Respirator fit during use;

~~((-))~~ (ii) Any effects of respirator use on work performance;

~~((-))~~ (iii) Respirators being appropriate for the hazards encountered;

~~((-))~~ (iv) Proper use under current worksite conditions;

~~((-))~~ (v) Proper maintenance.

When developing ~~((your))~~ a written program include applicable elements listed in Table 3.

Table 3

Required Elements for Required-Use Respirator Programs
<ul style="list-style-type: none"> • Selection: <ul style="list-style-type: none"> - Procedures for respirator selection - A list specifying the appropriate respirator for each respiratory hazard in ((your)) <u>the</u> workplace - Procedures for issuing the proper type of respirator, if appropriate
• Medical evaluation provisions
• Fit-test provisions and procedures, if tight-fitting respirators are selected
<ul style="list-style-type: none"> • Training provisions that address: <ul style="list-style-type: none"> - Respiratory hazards encountered during: <ul style="list-style-type: none"> ■ Routine activities ■ Infrequent activities, for example, bimonthly cleaning of equipment ■ Reasonably foreseeable emergencies, for example, rescue, spill response, or escape situations - Proper use of respirators, for example, how to put on or remove respirators, and use limitations. <p>Note: ((You do)) <u>The employer does</u> NOT need to repeat training on respiratory hazards if employees have been trained on this in compliance with other rules such as WAC 296-307-550, employer chemical hazard communication.</p>
<ul style="list-style-type: none"> • Respirator use procedures for: <ul style="list-style-type: none"> - Routine activities - Infrequent activities - Reasonably foreseeable emergencies
<ul style="list-style-type: none"> • Maintenance: <ul style="list-style-type: none"> - Procedures and schedules for respirator maintenance covering: <ul style="list-style-type: none"> ■ Cleaning and disinfecting ■ Storage ■ Inspection and repair ■ When to discard respirators - A cartridge or canister change schedule IF air-purifying respirators are selected for use against gas or vapor contaminants AND an end-of-service-life-indicator (ESLI) is not available. In addition, provide: <ul style="list-style-type: none"> ■ The data and other information ((you)) <u>the employer</u> relied on to calculate change schedule values (for example, highest contaminant concentration estimates, duration of employee respirator use, expected maximum humidity levels, user breathing rates, and safety factors)
• Procedures to ensure a safe air quantity and quality IF atmosphere-supplying respirators (air-line or SCBA) are selected
• Procedures for evaluating program effectiveness on a regular basis

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-60010 Keep respirator program records.

~~((You must:~~

•) (1) The employer must keep the following records:

~~((You))~~ (a) Current respirator program;

(-) (b) Each employee's current fit test record, if fit testing is conducted. Fit test records must include:

(■) (i) Employee name;

(■) (ii) Test date;

(■) (iii) Type of fit-test performed;

(■) (iv) Description (type, manufacturer, model, style, and size) of the respirator tested;

(■) (v) Results of fit tests, for example, for quantitative fit tests include the overall fit factor **AND** a print out, or other recording of the test.

(-) (c) Training records that include employee's names and the dates trained;

(-) (d) Written recommendations from the LHCP.

(•) (2) The employer must allow records required by this section to be examined and copied by affected employees and their representatives.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-602 Respirator selection.

~~((You))~~ Employer responsibility:

To select and provide respirators that are appropriate for the hazard, user, and worksite conditions.

Exemption: This section does NOT apply to voluntary respirator use. See WAC 296-307-598 of this part for voluntary use program requirements.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-60205 Select and provide appropriate respirators.

IMPORTANT:

See WAC 296-307-624(~~(Respiratory hazards)~~) Scope, for:

(*) 1. Hazard evaluation requirements. Evaluation results are necessary for respirator selection.

(*) 2. A list of substance-specific rules that may also apply (~~(to you)~~). Those listed rules have additional respirator selection requirements.

~~(You must)~~

*) The employer must select and provide, at no cost to employees, appropriate respirators for routine use, infrequent use, and reasonably foreseeable emergencies (such as escape, emergency, and spill response situations) by completing the following process:

Respirator Selection Process

Step 1: If (~~(you)~~) the only respirator use is for escape, skip to **Step 8** to select appropriate respirators.

Step 2: If the respiratory hazard is a biological aerosol, such as TB (tuberculosis), anthrax, psittacosis (parrot fever), or hanta virus, select a respirator appropriate for **nonemergency** activities recognized to present a health risk to workers AND skip to **Step 8**.

(*) (a) If respirator use will occur during **emergencies**, skip to **Step 8** and document the analysis used to select the appropriate respirator.

(*) (b) Use Centers for Disease Control (CDC) selection guidance for exposures to specific biological agents when this guidance exists. Visit (~~(http://www.cdc.gov)~~) https://www.cdc.gov.

Step 3: If the respiratory hazard is a pesticide, follow the respirator specification on the pesticide label AND skip to **Step 9**.

Step 4: Determine the expected exposure concentration for each respiratory hazard of concern. Use the results from the evaluation required by WAC 296-307-624, Respiratory hazards.

Step 5: Determine if the respiratory hazard is classified as IDLH; if it is NOT IDLH skip to **Step 7**.

(*) The respiratory hazard **IS** classified as IDLH if:

(-) (a) The atmosphere is oxygen deficient or oxygen enriched;

OR

(~~(You)~~) (b) The employer CANNOT measure or estimate (~~(you)~~) expected exposure concentration;

OR

(~~(You)~~) (c) The measured or estimated expected exposure concentration is greater or equal to the IDLH value in the NIOSH *Pocket Guide to Chemical Hazards*.

Notes: (**) 1. WISHA uses the IDLH values in the 1990 edition of the NIOSH *Pocket Guide to Hazardous Chemicals* to determine the existence of IDLH conditions. (~~(You)~~) The employer may use more recent editions of this guide. Visit www.cdc.gov/niosh for more information.

(**) 2. If your measured or estimated expected exposure concentration is below NIOSH's IDLH values, proceed to **Step 7**.

Step 6: Select an appropriate respirator from one of the following respirators for IDLH conditions and skip to **Step 8**:

(*) (a) Full-facepiece, pressure demand, self-contained breathing apparatus (SCBA) certified by NIOSH for a minimum service life of thirty minutes;

OR

(*) (b) Full-facepiece, pressure demand air-line respirator equipped with an auxiliary self-contained air supply.

Exception: If the respiratory hazard is oxygen deficiency AND (~~(you)~~) the employer can show oxygen concentrations can be controlled within the ranges listed in Table 4 under ALL foreseeable conditions, (~~(you are)~~) the employer is allowed to select ANY type of SCBA or air-line respirator.

**Table 4
Concentration Ranges for Oxygen Deficiency**

Altitude (as ft. above sea level)	Oxygen Concentration Range (as percent oxygen)
Below 3,001	16.0 - 19.5
3,001 - 4,000	16.4 - 19.5
4,001 - 5,000	17.1 - 19.5
5,001 - 6,000	17.8 - 19.5
6,001 - 8,000	19.3 - 19.5
Above 8,000 feet the exception does not apply.	

Step 7: Identify respirator types with assigned protection factors (APFs) from Table 5 that are appropriate to protect employees from the expected exposure concentration.

Step 8: Consider hazards that could require selection of specific respirator types. For example, select full-facepiece respirators to prevent eye irritation or abrasive blasting helmets to provide particle rebound protection.

Step 9: Evaluate user and workplace factors that might compromise respirator performance, reliability or safety.

(*) If the respiratory hazard is a pesticide, follow the requirements on the pesticide label and skip to **Step 11**.

Examples:

(*) (a) High humidity or temperature extremes in the workplace.

(*) (b) Necessary voice communication.

(*) (c) High traffic areas and moving machinery.

(*) (d) Time or distance for escape.

Step 10: Follow Table 6 requirements to select an air-purifying respirator.

(*) If Table 6 requirements cannot be met, (~~(you)~~) the employer must select an air-line respirator or an SCBA.

Step 11: Make sure respirators (~~(you)~~) the employer selects are certified by the National Institute for Occupational Safety and Health (NIOSH).

((*) To maintain certification, make sure the respirator is used according to cautions and limitations specified on the NIOSH approval label.

Note: While selecting respirators, ((y00)) the employer will need to select a sufficient number of types, models or sizes to provide for fit testing. ((Y00)) The employer can also consider other respirator use issues, such as accommodating facial hair with a loose fitting respirator.

Use Table 5 to identify the assigned protection factor for different types of respirators.

Table 5

Assigned Protection Factors (APF) for Respirator Types

If the respirator is a(n) . . .	Then the APF is . . .
Air-purifying respirator with a:	
• Half-facepiece	10
• Full-facepiece	100
Note: Half-facepiece includes 1/4 masks, filtering facepieces, and elastomeric facepieces.	
Powered air-purifying respirator (PAPR) with a:	
• Loose-fitting facepiece	25
• Half-facepiece	50
• Full-facepiece, equipped with HEPA filters, chemical cartridges or canisters	1000
• Hood or helmet, equipped with HEPA filters, chemical cartridges or canisters	1000
Air-line respirator with a:	
• Half-facepiece and designed to operate in demand mode	10
• Loose-fitting facepiece and designed to operate in continuous flow mode	25
• Half-facepiece and designed to operate in continuous-flow, or pressure-demand mode	50
• Full-facepiece and designed to operate in demand mode	100
• Full-facepiece and designed to operate in continuous-flow OR pressure-demand mode	1000
• Helmet or hood and designed to operate in continuous-flow mode	1000
Self-contained breathing apparatus (SCBA) with a tight fitting:	
• Half-facepiece and designed to operate in demand mode	10

If the respirator is a(n) . . .	Then the APF is . . .
• Full-facepiece and designed to operate in demand mode	100
• Full-facepiece and designed to operate in pressure-demand mode	10,000
Combination respirators:	
• Find the APF for each type of respirator in the combination.	The lowest value
• Use the lower APF to represent the combination.	

Use Table 6 to select air-purifying respirators for particle, vapor, or gas contaminants.

Table 6

Requirements for Selecting Any Air-purifying Respirator

If the contaminant is a . . .	Then . . .
• Gas OR vapor	<ul style="list-style-type: none"> • Provide a respirator with canisters or cartridges equipped with a NIOSH-certified, end-of-service-life indicator (ESLI) <p>OR</p> <ul style="list-style-type: none"> • If a canister or cartridge with an ESLI is NOT available, develop a cartridge change schedule to make sure the canisters or cartridges are replaced before they are no longer effective <p>OR</p> <ul style="list-style-type: none"> • Select an atmosphere-supplying respirator
• Particle, such as a dust, spray, mist, fog, fume, or aerosol	<ul style="list-style-type: none"> • Select respirators with filters certified to be at least 95% efficient by NIOSH - For example, N95s, R99s, P100s, or High Efficiency Particulate Air filters (HEPA) <p>OR</p>

If the contaminant is a . . .	Then . . .
	<p>• ((You)) <u>The employer</u> may select respirators NIOSH certified as "dust and mist," "dust, fume, or mist," OR "pesticides." ((You)) <u>The employer</u> can only use these respirators if particles primarily have a mass median aerodynamic diameter of at least two micrometers.</p> <p>Note: These respirators are no longer sold for occupational use.</p>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-604 Medical evaluations.

~~((You))~~ **Employer responsibility:**

To make sure a respirator used under ~~((you))~~ the employer's specific worksite conditions is not a health risk to employees.

- Exemption:** This section does **NOT** apply to employees who **only** use:
- ((*) 1. Filtering-facepiece respirators voluntarily. See WAC 296-307-598 of this part for voluntary use requirements;
 - OR**
 - ((*) 2. Escape-only respirators that are mouthpiece, loose-fitting, or hooded respirators.

IMPORTANT:

((*) Using a respirator can create physical risks for an employee each time it is worn. The extent of these risks depends on these factors:

- ((-) 1. Type of respirator;
- ((-) 2. Environmental conditions at the worksite;
- ((-) 3. Physical demands of the work;
- ((-) 4. Use of other protective clothing;
- ((-) 5. Employee's health status.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-60405 Provide medical evaluations.

IMPORTANT:

If ~~((you have))~~ the employer has provided an employee with a medical evaluation addressing respirator use, as required by another chapter, that evaluation will meet the requirements of this section.

~~((You must:~~

*) The employer must follow the medical evaluation process, Steps 1 through 7 in this section, to provide medical evaluations for employees at no cost to them.

Medical Evaluation Process

Step 1: Identify employees who need medical evaluations AND determine the frequency of evaluations from Table 7. Include employees who:

- ((*) (a) Are required to use respirators;
- OR**
- ((*) (b) Voluntarily use respirators that are **not** filtering-facepiece respirators.

Note: ~~((You))~~ The employer may use a previous employer's medical evaluation for an employee if ~~((you))~~ the employer can:

((*) 1. Show the employee's previous work and use conditions were substantially similar to ~~((yours))~~ the employer's;

AND

((*) 2. Obtain a copy of the licensed health care professional's (LHCP's) written recommendation approving the employee's use of the respirator chosen by you.

Step 2: Identify a licensed health care professional (LHCP) to perform ~~((you))~~ the medical evaluations.

Note: If ~~((you))~~ the employer selects a different LHCP, ~~((you))~~ they do not need to have new medical evaluations done.

Step 3: Make sure ~~((you))~~ the LHCP has the following information **before** the evaluation is completed:

- ((*) (a) Information describing the respirators employees may use, including the weight and type.
- ((*) (b) How the respirators will be used, including:
 - ((-) (i) How often the respirator will be used, for example, daily, or once a month;
 - ((-) (ii) The duration of respirator use, for example, a minimum of one hour, or up to twelve hours;
 - ((-) (iii) The employee's expected physical work effort;
 - ((-) (iv) Additional personal protective clothing and equipment to be worn;
 - ((-) (v) Temperature and humidity extremes expected during use.
- ((*) (c) A copy of ~~((you))~~ the employer's written respiratory protection program **and** this part.

Notes: ~~((You))~~ 1. The employer may choose to send the questionnaire to the LHCP ahead of time, giving time to review it and add any necessary questions.

((*) 2. The LHCP determines what questions to add to the questionnaire, if any; however, questions in Parts 1-3 may not be deleted or substantially altered.

Step 4: Administer the medical questionnaire in WAC 296-307-61605 to employees, OR provide them a medical exam that obtains the same information.

Note: ~~((You))~~ The employer may use online questionnaires if the questions are the same and requirements of this section are met.

((*) (a) Administer the examination or questionnaire at no cost to employees:

- ((-) (i) During the employee's normal working hours;
- OR**
- ((-) (ii) At a time and place convenient to the employee.
- ((*) (b) Maintain employee confidentiality during examination or questionnaire administration:

((-) (i) Do **not** view employee's answers on the questionnaire;

((-) (ii) Do **not** act in a manner that may be considered a breach of confidentiality.

Note: Providing confidentiality is important for securing successful medical evaluations. It helps make sure the LHCP gets complete and dependable answers on the questionnaire.

((*) (c) Make sure employees understand the content of the questionnaire.

((*) (d) Provide the employee with an opportunity to discuss the questionnaire or exam results with the LHCP.

Step 5: Provide follow-up evaluation for employees when:

((*) (a) The LHCP needs more information to make a final recommendation;

OR

((*) (b) An employee gives any positive response to questions 1-8 in Part 2 OR to questions 1-6 in Part 3 of the WISHA medical evaluation questionnaire in WAC 296-307-61605.

Note: Follow-up may include:

((*) 1. Employee consultation with the LHCP such as a telephone conversation to evaluate positive questionnaire responses;

((*) 2. Medical exams;

((*) 3. Medical tests or other diagnostic procedures.

Step 6: Obtain a written recommendation from the LHCP that contains only the following medical information:

((*) (a) Whether or not the employee is medically able to use the respirator;

((*) (b) Any limitations of respirator use for the employee;

((*) (c) What future medical evaluations, if any, are needed;

((*) (d) A statement that the employee has been provided a copy of the written recommendation.

Step 7: Provide a powered, air-purifying respirator (PAPR) when the LHCP determines the employee should not wear a negative-pressure air-purifying respirator AND is able to wear a PAPR.

Reference: See WAC 296-307-602 for requirements regarding selection of air-purifying respirators.

Notes: ((*) ~~You~~) 1. The employer may discontinue medical evaluations for an employee when the employee no longer uses a respirator.

((*) 2. If ((you have)) the employer has staff conducting ((you) ~~its~~) its medical evaluations, they may keep completed questionnaires and findings as confidential medical records, if they are maintained separately from other records.

Use Table 7 to determine medical evaluation frequency.

Table 7
Evaluation Frequency

Type of Evaluation:	When required:
Initial medical evaluations	<ul style="list-style-type: none"> • Before respirators are fit-tested or used in the workplace.
Subsequent medical evaluations	<ul style="list-style-type: none"> • If any of these occur: <ul style="list-style-type: none"> - ((You)) <u>The employer's</u> licensed health care professional (LHCP) recommends them; for example, periodic evaluations at specified intervals. - A respirator program administrator or supervisor informs ((you)) <u>the employer</u> that an employee needs reevaluation. - Medical signs or symptoms (such as breathing difficulties) are: <ul style="list-style-type: none"> ■ Observed during fit-testing or program evaluation <p>OR</p> <ul style="list-style-type: none"> ■ Reported by the employee - Changes in worksite conditions such as physical work effort, personal protective clothing, or temperature that could substantially increase the employee's physiological stress.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-606 Fit testing.

~~((You))~~ **Employer responsibility:**

To make sure negative and positive-pressure tight-fitting respirators can provide an adequate fit and acceptable level of comfort for employees.

Exemption: This section does NOT apply to any respirators that are:

((*) 1. Voluntarily used. See WAC 296-307-598 for voluntary use requirements.

((*) 2. Mouthpiece respirators.

IMPORTANT:

((*) 1. Fit testing is an activity where the seal of a respirator is tested to determine if it is adequate.

((*) 2. This section covers general **requirements** for fit testing. Fit-testing **procedures** are covered in WAC 296-307-62010 of this part.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-60605 Conduct fit testing.

~~((You must:~~

~~*)~~ (1) The employer must provide, at no cost to the employee, fit tests for ALL tight fitting respirators on the following schedule:

((-)) (a) Before employees are assigned duties that may require the use of respirators;

((-)) (b) At least every twelve months after initial testing;

((-)) (c) Whenever any of the following occurs:

((■)) (i) A different respirator facepiece is chosen such as a different type, model, style, or size;

((■-You)) (ii) The employer becomes aware of a physical change in an employee that could affect respirator fit. For example, ((you)) the employer may observe, or be told about, facial scarring, dental changes, cosmetic surgery, or obvious weight changes;

((■)) (iii) An employee notifies ((you)) the employer, or ((you)) the employer's LHCP, that the respirator fit is unacceptable. During the retest, ((you)) the employer must give an employee reasonable opportunity to select a different respirator facepiece (size, model, etc.).

Note: ((You)) The employer may accept a fit test completed by a previous employer **IF:**

((-You)) 1. The employer obtain written documentation of the fit test;

AND

((*) 2. The results of the fit test are not more than twelve months old;

AND

((*) 3. The employee will use the same respirator (the same type, model, style, and size);

AND

((*) 4. The fit test was conducted in a way that meets the requirements of WAC 296-307-606 and 296-307-62010.

~~((You must:~~

*) (2) The employer must select an appropriate fit-testing procedure from WAC 296-307-62010 of this part **AND:**

((-)) (a) Use quantitative fit-test methods when a negative pressure respirator will be used in concentrations requiring a protection factor greater than 10. This includes:

((■)) (i) Full facepiece air-purifying respirators;

((■)) (ii) SCBAs operated in demand (negative pressure) mode;

((■)) (iii) Air-line respirators operated in demand mode.

((-)) (b) Make sure PAPRs, SCBAs, or air-line respirators are fit tested in negative-pressure mode.

((*) (3) The employer must make sure the person conducting fit testing is able to do ALL of the following:

((-)) (a) Prepare test solutions if required;

((-)) (b) Make sure equipment works properly;

((-)) (c) Perform tests properly;

((-)) (d) Recognize invalid tests;

((-)) (e) Calculate fit factors properly if required.

Notes: ((*) 1. No specific training program or certification is required for those who conduct fit tests.

((-You)) 2. The employer should consider evaluating these individuals to determine their proficiency in the fit-testing method to be used.

((-You)) 3. The employer can use an evaluation form such as the form included in the American National Standard for Respirator Fit Testing Methods, ANSI/AIHA Z88.10-2001 to determine if the individual meets these requirements. Visit www.ansi.org or www.aiha.org.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-608 Training.

~~((You))~~ **Employer responsibility:**

To make sure employees who are required to use respirators understand and can demonstrate proper respirator use and maintenance.

IMPORTANT:

This section applies to employees who voluntarily use respirators only when training is necessary to prevent the respirator from creating a hazard. See WAC 296-307-598 for voluntary use requirements.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-60805 Provide effective training.

~~((You must:~~

*) (1) The employer must train employees, based on their duties, if they do any of the following:

((-)) (a) Use respirators;

((-)) (b) Supervise respirator users;

((-)) (c) Issue, repair, or adjust respirators;

((*) (2) The employer must present effective training in a way that employees understand.

Notes: ((*) 1. Training may be provided using audiovisuals, slide presentations, formal classroom instruction, informal discussions during safety meetings, training programs conducted by outside sources, or a combination of these methods.

((-You)) 2. The employer may want to have instructors available when using video or automated training methods to:

((-)) a. Encourage and provide responses to questions for the benefit of employees;

((-)) b. Evaluate employees' understanding of the material;

((-)) c. Provide other instructional interaction to employees.

~~((You must:~~

*) (3) The employer must make sure a qualified instructor provides training.

((*) (4) The employer must provide training, at no cost to the employee, at these times:

((-)) (a) Initially, before worksite respirator use begins;

((-)) (b) Periodically, within twelve months of the previous training;

((-)) (c) Additionally, when the following occur:

((■)) (i) The employee has not retained knowledge or skills;

OR

((■)) (ii) Changes in the worksite, or type of respirator make previous training incomplete or obsolete.

Notes: ((-You)) 1. The employer may accept an employee's previous training, such as training provided by another employer, to satisfy the initial training requirement if:

((-You)) a. The employer can demonstrate the employee received training within the past twelve months;

AND

((-)) b. The employee can demonstrate the knowledge and skills to use required respirators effectively.

~~((*) 2. If (you) the employer accepts an employee's previous training to satisfy the initial training requirement, ((you are)) the employer is still responsible for providing periodic, and additional training when needed. Periodic training would need to be provided within twelve months of the employee's previous training.~~

~~((You must:~~

~~*) (5) The employer must make sure employees can demonstrate the following knowledge and skills as required by their duties:~~

~~((-) (a) Why the respirator is necessary. Include, for example, information identifying respiratory hazards such as hazardous chemicals, the extent of the employee's exposure, and potential health effects and symptoms;~~

~~((-) (b) The respirator's capabilities and limitations. Include, for example, how the respirator provides protection and why air-purifying respirators cannot be used in oxygen-deficient conditions;~~

~~((-) (c) How improper fit, use, or maintenance can compromise the respirator's effectiveness and reliability;~~

~~((-) (d) How to properly inspect, put on, seal check, use, and remove the respirator;~~

~~((-) (e) How to clean, disinfect, repair, and store the respirator, or how to get this done by someone else;~~

~~((-) (f) How to use the respirator effectively in emergency situations; including what to do when a respirator fails and where emergency respirators are stored;~~

~~((-) (g) Medical signs and symptoms that may limit or prevent the effective use of respirators such as shortness of breath or dizziness;~~

~~((-) (h) The employer's general obligations under this part. For example, developing a written program, selecting appropriate respirators, and providing medical evaluations.~~

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-610 Maintenance.

~~((You must:~~ **Employer responsibility:**

To make sure respirators are maintained so they will function properly and not create health hazards such as skin irritation.

~~((You must:~~

~~Maintain respirators in a clean and reliable condition~~

~~WAC 296-307-61005~~

~~Store respirators properly~~

~~WAC 296-307-61010~~

~~Inspect and repair respirators~~

~~WAC 296-307-61015))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Maintain respirators in a clean and reliable condition.</u>	<u>WAC 296-307-61005</u>
<u>Store respirators properly.</u>	<u>WAC 296-307-61010</u>
<u>Inspect and repair respirators.</u>	<u>WAC 296-307-61015</u>

IMPORTANT:

This section applies to employees who voluntarily use respirators only when maintenance is necessary to prevent the respirator from creating a hazard. See WAC 296-307-598 for voluntary use requirements.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-61005 Maintain respirators in a clean and reliable condition.

~~((You must:~~

~~*) (1) The employer must make sure respirators are kept, at no cost to the employee, clean, sanitary and in good working order. Do at least the following:~~

~~((-) Clean and disinfect respirators as often as specified in Table 8 of this section.~~

Notes:

~~((*) 1. Use required cleaning and disinfecting procedures in WAC 296-307-62015, or the manufacturer's procedures that:~~

~~((-) a. Result in a clean and sanitary respirator;~~

~~((-) b. Do not damage the respirator;~~

~~((-) c. Do not harm the user;~~

~~((*) 2. Automated cleaning and disinfecting are permitted;~~

~~((*) 3. Cleaning and disinfecting may be done by a central facility as long as you make sure respirators provided are clean, sanitary, and function properly.~~

~~((You must:~~

~~*) (2) The employer must make sure respirators are assembled properly after cleaning or disinfecting.~~

Use Table 8 to determine how often to clean and disinfect respirators.

Table 8

Required Frequencies for Cleaning and Disinfecting Respirators

If, the respirator will be . . .	Then, clean and disinfect the respirator . . .
<ul style="list-style-type: none"> • Used exclusively by one employee 	<ul style="list-style-type: none"> • As often as needed to: <ul style="list-style-type: none"> - Keep it clean and functional AND - To prevent health hazards such as skin irritation
<ul style="list-style-type: none"> • Shared for nonemergency use <p>OR</p> <ul style="list-style-type: none"> • Used for fit-testing or training 	<ul style="list-style-type: none"> • Before it is worn by another employee
<ul style="list-style-type: none"> • Shared for emergency use 	<ul style="list-style-type: none"> • After each use so the respirator is immediately ready for use at all times

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-61010 Store respirators properly.

~~((You must:))~~

*) (1) The employer must store respirators to protect them from ALL of the following:

- ((-)) (a) Deformation of the facepiece or exhalation valve;
- ((-)) (b) Sunlight or extreme temperatures or other conditions;
- ((-)) (c) Contamination such as dust or damaging chemicals;
- ((-)) (d) Excessive moisture.

Note: Use coffee cans, sealable plastic bags, or other suitable means of protection.

~~((You must:))~~

*) (2) The employer must follow these additional requirements for emergency respirators:

- ((-)) (a) Keep respirators accessible to the work area;
- ((-)) (b) Store respirators in compartments or with covers clearly marked as containing emergency respirators;
- ((-)) (c) Follow additional storage instructions from the respirator manufacturer;
- ((-)) (d) Store an adequate number of emergency respirators in each area where they may be needed.

Note: Emergency respirators include mouthpiece respirators and other respirators that are limited to escape-only use by their NIOSH certification.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-61015 Inspect and repair respirators.

~~((You must:))~~

*) (1) The employer must conduct respirator inspections as often as specified in Table 9.

(*) (2) The employer must make sure respirator inspections cover **all** of the following:

- ((-)) (a) Respirator function;
- ((-)) (b) Tightness of connections;
- ((-)) (c) The condition of the facepiece, head straps, valves, connecting tubes, and cartridge, canisters or filters;
- ((-)) (d) Pliability and deterioration of elastomeric parts;
- ((-)) (e) Maintenance of air or oxygen cylinders;
- ((-)) (f) Making sure SCBA air cylinders are at ninety percent of the manufacturer's recommended pressure level;
- ((-)) (g) Proper functioning of SCBA regulators when air-flow is activated;
- ((-)) (h) Proper functioning of SCBA low-pressure warning devices when activated.

(*) (3) The employer must certify inspections for emergency respirators by documenting the following:

- ((-)) (a) Inspection date;
- ((-)) (b) Serial number of each respirator or other identifying information;
- ((-)) (c) Inspector's name or signature;
- ((-)) (d) Inspection findings;
- ((-)) (e) Required action, if problems are found.

Note: ((*) When documenting inspections ((you)) the employer may either:

((-)) 1. Provide the information on a tag or label and attach it to the respirator compartment;

OR

((-)) 2. Include the information in an inspection report stored in paper or electronic files accessible to employees.

~~((You must:))~~

*) (4) The employer must repair or replace any respirator that is not functioning properly **before** the employee returns to a situation where respirators are required.

((-)) (a) If respirators fail inspection or are not functioning properly during use due to problems such as leakage, vapor or gas breakthrough, or increased breathing resistance, **ALL** of the following apply:

((*) (i) Do NOT permit such respirators to be used until properly repaired or adjusted;

((*) (ii) Use only NIOSH-certified parts;

((*) (iii) Make sure repairs and adjustments are made by appropriately trained individuals.

((-)) (b) Use the manufacturer or a technician trained by the manufacturer to repair or adjust reducing and admission valves, regulators, and warning devices on SCBAs or air-line respirators.

((*) (c) Follow the manufacturer's recommendations and specifications for the type and extent of repairs.

Use Table 9 to determine how often to inspect respirators.

Table 9

Required Frequencies for Respirator Inspections

If the respirator is . . .	Then inspect . . .
A SCBA in any use	<ul style="list-style-type: none"> • Before each use AND • During cleaning OR • Monthly if NOT used
Used for nonemergencies, including day-to-day or infrequent use	<ul style="list-style-type: none"> • Inspect before each use AND • During cleaning
Used only for emergencies	<ul style="list-style-type: none"> • Check for proper function before and after each use AND • Inspect at least monthly as instructed by the manufacturer
Used for escape-only purposes	<ul style="list-style-type: none"> • Before carrying into a work place for use

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-612 Safe use and removal of respirators.

~~((You))~~ Employer responsibility:

To make sure respirator use and removal is safe.

Exemption: These sections do NOT apply to employees who voluntarily use any type of respirator. See WAC 296-307-598 for voluntary use requirements.

~~((You must: Prevent sealing problems with tight-fitting respirators WAC 296-307-61205 Make sure employees leave the use area before removing respirators WAC 296-307-61210.))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Prevent sealing problems with tight-fitting respirators.</u>	<u>WAC 296-307-61205</u>
<u>Make sure employees leave the use area before removing respirators.</u>	<u>WAC 296-307-61210</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-61205 Prevent sealing problems with tight-fitting respirators.

~~((You must:~~

~~*) (1) The employer must make sure employees use the procedure in WAC 296-307-62020 to perform a user seal check each time they put on their tight-fitting respirator.~~

~~((*) (2) The employer must make sure ((you)) employees do NOT ((permit)) use a respirator ((use)) if employees have a characteristic that interferes with the respirator face-piece seal or valve function. For example, stubble, moustaches, sideburns, bangs, hairlines, or scars between the face and the sealing surface of the respirator will affect the seal.~~

~~((*) (3) The employer must make sure corrective glasses or personal protective equipment (PPE) do NOT interfere with the facepiece seal. Examples of PPE include safety glasses, goggles, faceshields, clothing, and hard hats.~~

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-61210 Make sure employees leave the use area before removing respirators.

~~((You must:~~

~~*) The employer must make sure employees leave the use area for any of these reasons:~~

~~((-) (1) To replace air-purifying filters, cartridges, or canisters;~~

~~((-) (2) When they smell or taste (detect) vapor or gas leakage from, for example, cartridges, canister, or the face-piece seal;~~

~~((-) (3) When they detect changes in breathing resistance;~~

~~((-) (4) To readjust their respirators;~~

~~((-) (5) To wash their faces and respirators as necessary to prevent skin or eye irritation;~~

~~((-) (6) If they become ill;~~

~~((-) (7) If they experience sensations of dizziness, nausea, weakness, breathing difficulty, coughing, sneezing, vomiting, fever, or chills.~~

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-614 Standby requirements for immediately dangerous to life or health (IDLH) conditions.

~~((You)) Employer responsibility:~~

To provide adequate assistance to employees using respirators in conditions immediately dangerous to life or health (IDLH).

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-61405 Provide standby assistance in immediately dangerous to life or health (IDLH) conditions.

IMPORTANT:

WISHA currently uses the IDLH values in the 1990 NIOSH *Pocket Guide to Chemical Hazards* to determine the existence of IDLH conditions. ~~((You)) The employer~~ may use more recent editions of this guide. Visit ~~((www.edc.gov/niosh))~~ <https://www.cdc.gov/niosh> for more information.

~~((You must:~~

~~*) (1) The employer must provide at least two standby employees outside the IDLH area.~~

Note: ~~((You)) The employer~~ need only one standby employee if the IDLH condition is well characterized, will remain stable **AND** ~~((you)) the employer~~ can show one employee can adequately do **ALL** of the following:

~~((*) 1. Monitor employees in the IDLH area;~~

~~((*) 2. Implement communication;~~

~~((*) 3. Initiate rescue duties.~~

~~((*) (2) The employer must train and equip standby employees to provide effective emergency rescue. Equip them with:~~

~~((-) (a) A pressure-demand SCBA or a pressure-demand air-line respirator with an auxiliary SCBA, for each standby employee;~~

~~((-) (b) Appropriate retrieval equipment, when it would help with the effective rescue of the entrant, or an equivalent means of rescue;~~

~~((*) (3) The employer must make sure standby employees maintain visual, voice, or signal line communication with employees in the IDLH area;~~

~~((*) (4) The employer must make sure that in the event of an emergency:~~

~~((-) (a) Standby employees notify ((you)) the employer or ((your)) the employer's designee before they enter the IDLH area to provide emergency rescue;~~

~~((-You)) (b) The employer provides necessary assistance when notified.~~

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-616 Air quality for self-contained breathing apparatus (SCBA) and air-line respirators.

~~((You must))~~ **Employer responsibility:**

To provide employees who use SCBAs or air-line respirators with an acceptable air supply.

~~((You must:~~

~~Make sure breathing air and oxygen meet established specifications~~

~~WAC 296-307-61605~~

~~Prevent conditions that could create a hazardous breathing air supply~~

~~WAC 296-307-61610~~

~~Make sure compressors do not create a hazardous breathing air supply~~

~~WAC 296-307-61615.))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Make sure breathing air and oxygen meet established specifications.</u>	<u>WAC 296-307-61605</u>
<u>Prevent conditions that could create a hazardous breathing air supply.</u>	<u>WAC 296-307-61610</u>
<u>Make sure compressors do not create a hazardous breathing air supply.</u>	<u>WAC 296-307-61615</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-61605 Make sure breathing air and oxygen meet established specifications.

~~((You must:~~

~~*) (1) The employer must make sure that all SCBAs and air-line respirators are provided with safe breathing air and oxygen according to the following:~~

~~((-) Compressed breathing air must meet the following specifications for Grade D air:~~

~~((■)) (a) Oxygen (volume/volume) within 19.5-23.5%;~~

~~((■)) (b) Hydrocarbon (condensed): NO MORE than five milligrams per cubic meter of air;~~

~~((■)) (c) Carbon monoxide (CO): NO MORE than ten parts per million (ppm);~~

~~((■)) (d) Carbon dioxide (CO2): NO MORE than 1,000 ppm;~~

~~((■)) (e) No noticeable odor.~~

Reference: See the American National Standards Institute - Compressed Gas Association Commodity Specification for Air (G-7.1.1989) for more information. Contact your local library to access a copy.

~~((You must:~~

~~*) (2) The employer must make sure the moisture content of the air supplied meets the following:~~

~~((-) (a) Air supplied to respirators from cylinders must NOT exceed a dew point of -50°F (or -45.6°C) at 1 atmospheric pressure.~~

~~((-) (b) Compressor supplied air must NOT exceed a dew point of 10°F (or 5.56°C) BELOW the use temperature at 1 atmospheric pressure.~~

~~((*) (3) The employer must make sure cylinders obtained from a supplier of breathing air must have a certificate of analysis that verifies each cylinder's contents meet Grade D and dew point standards.~~

~~((*) (4) The employer must make sure compressed and liquid oxygen ((must)) meet the United States Pharmacopoeia requirements for medical or breathing oxygen.~~

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-61610 Prevent conditions that could create a hazardous breathing air supply.

~~((You must:~~

~~*) (1) The employer must use SCBA and air-line respirators safely:~~

~~((-) Do NOT supply compressed oxygen to SCBAs or air-line respirators that previously used compressed air.~~

Note: Compressed air leaves residues containing hydrocarbons such as oil or grease. Fire or explosion can occur if compressed oxygen makes contact with these residues.

~~((You must:~~

~~*) (2) The employer must use breathing air couplings on air-line respirators that are NOT compatible with couplings for nonrespirable air or other gas systems, for example, utility air used for manufacturing purposes.~~

~~((-Do)) (3) The employer must NOT allow asphyxiating substances to enter breathing air lines; for example, do not flush nitrogen through worksite air lines also used for breathing air.~~

~~((*) (4) The employer must use equipment specifically designed for oxygen service or distribution IF oxygen concentrations greater than 23.5% are used.~~

Note: Respiratory equipment NOT designed for oxygen service or distribution can create fire or explosion hazards in oxygen concentrations higher than 23.5%.

~~((You must:~~

~~*) (5) The employer must make sure cylinders used to supply breathing air for SCBAs or air-line respirators are tested and maintained as described in the federal Department of Transportation's (DOT) Shipping Container Specification Regulations, Title 49 C.F.R. Parts 173 and 178.~~

Notes: ((*) 1. Use only cylinders marked (with serial number, cylinder pressure, DOT exemption number, and test dates) according to these DOT regulations.

((*) 2. To find any Code of Federal Regulations (C.F.R.) visit: www.access.gpo.gov.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-61615 Make sure compressors do not create a hazardous breathing air supply.

IMPORTANT:

((*) 1. Ambient-air movers (or pumps) used to supply air to respirators must be used according to the manufacturer's instructions.

((*) 2. Respirators used with ambient-air movers must be approved by NIOSH to operate within the pressure ranges of the air mover.

~~((You must:))~~

(1) The employer must locate or modify compressor intakes so they will not pick up contaminated air OR exhaust gases such as carbon monoxide from:

((*) (a) Fuel-powered vehicles;

OR

((*) (b) The internal combustion motor of the compressor;

OR

((*) (c) Other contaminant sources in the area, for example, a ventilation system discharge.

Note: ~~((You))~~ 1. The employer may need to reposition or extend the compressor's intake or engine exhaust pipe or outlet, especially if they are located near each other.

((*) 2. Be aware that exhaust gases may not adequately disperse when the compressor is operated in:

((-) a. An enclosed space such as a small room, a corner, or near a wall;

OR

((-) b. In turbulent wind conditions.

~~((You must:))~~

(2) The employer must equip compressors with suitable air-purifying filters, water traps, and sorbents (such as charcoal beds) and maintain them as follows:

((*) (a) Periodically change or clean them according to the manufacturer or supplier's instructions;

((*) (b) Keep a tag at the compressor with the following information:

((-) (i) When the sorbent and filters were last replaced or cleaned;

((-) (ii) The date of the most recent changes or cleaning;

((-) (iii) The signature of the person authorized by the employer to perform changes or cleaning.

Note: To be sure ~~((you are))~~ the employer is providing the recommended operating pressure for respirators, ~~((you))~~ the employer may need to install a delivery pressure gauge at the point where the manifold respirator hose is attached.

~~((You must:))~~

(3) The employer must make sure the carbon monoxide (CO) level in breathing air from compressors does NOT exceed ten parts per million (ppm).

Note: If ~~((you do))~~ the employer does not have a reliable CO-free area available for locating ~~((you))~~ compressor intake, consider these examples of methods to prevent CO contamination of the air supply:

((*) 1. Use of continuous and effective carbon monoxide alarms and filters;

((*) 2. Conduct frequent monitoring of air quality;

((*) 3. Use a CO converter (converts CO to carbon dioxide).

~~((You must:))~~

~~((You))~~ (4) The employer must maintain CO levels in oil lubricated compressors by using at least one of the following:

((-) (a) An effective CO alarm;

((-) (b) An effective high temperature alarm AND testing the air supply often enough to see if CO levels exceed ten ppm.

Notes: ((*) 1. How often to test depends on a number of considerations, for example:

((-) a. Compressor age;

((-) b. Maintenance history of the compressor;

((-) c. Stability of CO readings.

((*) 2. If the CO or high temperature alarm cannot be heard by the employee, a flashing light or other effective alternative to an audio alarm needs to be used.

((*) 3. Safeguards, such as alarms, are necessary to prevent CO contamination resulting from compressor overheating.

((*) 4. Any type of oil-lubricated compressor, such as screw or piston types, may produce dangerous levels of CO if overheating occurs.

((-) Old compressors are known to leak oil due to worn parts, increasing the possibility for overheating. Newer compressors may also overheat if maintenance practices are poor. For example, poor maintenance practices may lead to disconnected or incorrectly set alarms, inoperative shut-offs, or an impaired cooling system.

~~((You need))~~ 5. The employer needs to instruct employees to move to a safe area when the alarm sounds AND to stop using respirators.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-618 Labeling of air-purifying respirator filters, cartridges, and canisters.

~~((You))~~ Employer responsibility:

To make sure employees, their supervisors, and program administrators can easily check for the correct air-purifying filters, cartridges, and canisters on respirators.

Exemption: This section does NOT apply to filtering-facepiece respirators when used voluntarily. See WAC 296-307-598 for voluntary use requirements.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-61805 Keep labels readable on respirator filters, cartridges, and canisters during use.

~~((You must:))~~

~~((You))~~ The employer must make sure the NIOSH certification labeling and color-coding on air-purifying respirator filters, cartridges, and canisters remains readable and intact during use.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-620 Required procedures for respiratory protection program.

~~((You))~~ Employer responsibility:

To use the procedures and questionnaire provided in this section when implementing ~~((you))~~ a respiratory protection program.

~~((You must:))~~

Use this medical questionnaire for medical evaluations

~~WAC 296-307-62005~~

~~Follow these fit-testing procedures for tight-fitting respirators~~

~~WAC 296-307-62010~~

~~Follow procedures established for cleaning and disinfecting respirators~~

~~WAC 296-307-62015~~

~~Follow procedures established for seal checking respirators~~

~~WAC 296-307-62020~~

The employer must meet the requirements...	in this section:
Use this medical questionnaire for medical evaluations.	<u>WAC 296-307-62005</u>
Follow these fit-testing procedures for tight-fitting respirators.	<u>WAC 296-307-62010</u>
Follow procedures established for cleaning and disinfecting respirators.	<u>WAC 296-307-62015</u>
Follow procedures established for seal checking respirators.	<u>WAC 296-307-62020</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-62005 Use this medical questionnaire for medical evaluations.

~~(You must:~~

~~*) The employer must use the medical questionnaire in Table 10 when conducting medical evaluations.~~

Note: ~~(*) 1. The employer may use a physical exam instead of this questionnaire if the exam covers the same information as the questionnaire.~~

~~(*) 2. The employer may use online questionnaires if the questions are the same and the requirements in WAC 296-307-604 of this part are met.~~

~~(*) 3. The employer may choose to send the questionnaire to the LCHP ahead of time, giving time to review it and add any necessary questions.~~

~~(*) 4. The LHCP determines what questions to add to the questionnaire, if any; however, questions in Parts 1-3 may not be deleted or substantially altered.~~

Table 10

WISHA Medical Evaluation Questionnaire
<p>Employer instructions:</p> <ul style="list-style-type: none"> ((You)) <u>The employer</u> may use online questionnaires if the requirements in WAC 296-307-60405 are met. ((You)) <u>The employer</u> must tell ((you)) <u>the</u> employee how to deliver or send the completed questionnaire to the health care provider ((you have)) <u>the employer</u> selected. ((You)) <u>The employer</u> must NOT review employees' questionnaires.
<p>Health care provider's instructions:</p> <ul style="list-style-type: none"> Review the information in this questionnaire and any additional information provided ((to you)) by the employer. ((You)) <u>The health care provider</u> may add questions to this questionnaire at ((you)) <u>the</u> discretion of <u>the health care provider</u>; HOWEVER, questions in Parts 1-3 may not be deleted or substantially altered. Follow-up evaluation is required for any positive response to questions 1-8 in Part 2, or questions 1-6 in Part 3. This might include: Phone consultations to evaluate positive responses, medical tests, and diagnostic procedures. When ((you)) <u>the health care provider's</u> evaluation is complete, send a copy of ((you)) <u>the</u> written recommendation to the employer AND employee.
<p>Employee information and instructions:</p> <ul style="list-style-type: none"> ((You)) <u>The employee's</u> employer must allow ((you)) <u>the employee</u> to answer this questionnaire during normal working hours, or at a time and place that's convenient to ((you)) <u>the employee</u>. ((You)) <u>The employee's</u> employer or supervisor must not look at or review ((you)) <u>the employee's</u> answers at any time.

Part 1 - Employee Background Information

ALL employees must complete this part

Please print

1. Today's date: _____
2. Your name: _____
3. Your age (to nearest year): ____
4. Sex (circle one): Male / Female
5. Your height: ___ ft. ___ in.
6. Your weight: ____ lbs.

7. Your job title: _____

8. A phone number where you can be reached by the health care professional who reviews this questionnaire (include Area Code): _____

9. The best time to call you at this number: _____

10. Has your employer told you how to contact the health care professional who will review this questionnaire? Yes / No

11. Check the type of respirator(s) you will be using:

a. ___ N, R, or P filtering-facepiece respirator (for example, a dust mask, OR an N95 filtering-facepiece respirator).

b. Check all that apply.

Half mask Full facepiece mask Helmet hood Escape

Nonpowered cartridge or canister Powered air-purifying cartridge respirator (PAPR)

Supplied-air or Air-line

Self-contained breathing apparatus (SCBA): Demand or Pressure demand

Other: _____

12. Have you previously worn a respirator? Yes / No

If "yes," describe what type(s): _____

Part 2 - General Health Information
ALL employees must complete this part
Please circle "Yes" or "No"

1. Do you *currently* smoke tobacco, or have you smoked tobacco in the last month? Yes / No

2. Have you *ever had* any of the following conditions?

a. Seizures (fits): Yes / No

b. Diabetes (sugar disease): Yes / No

c. Allergic reactions that interfere with your breathing: Yes / No

d. Claustrophobia (fear of closed-in places): Yes / No

e. Trouble smelling odors: Yes / No

3. Have you *ever had* any of the following pulmonary or lung problems?

a. Asbestosis: Yes / No

b. Asthma: Yes / No

c. Chronic bronchitis: Yes / No

d. Emphysema: Yes / No

e. Pneumonia: Yes / No

f. Tuberculosis: Yes / No

g. Silicosis: Yes / No

h. Pneumothorax (collapsed lung): Yes / No

i. Lung cancer: Yes / No

j. Broken ribs: Yes / No

k. Any chest injuries or surgeries: Yes / No

l. Any other lung problem that you have been told about: Yes / No

4. Do you *currently* have any of the following symptoms of pulmonary or lung illness?

a. Shortness of breath: Yes / No

b. Shortness of breath when walking fast on level ground or walking up a slight hill or incline: Yes / No

c. Shortness of breath when walking with other people at an ordinary pace on level ground: Yes / No

d. Have to stop for breath when walking at your own pace on level ground: Yes / No

e. Shortness of breath when washing or dressing yourself:	Yes	/	No
f. Shortness of breath that interferes with your job:	Yes	/	No
g. Coughing that produces phlegm (thick sputum):	Yes	/	No
h. Coughing that wakes you early in the morning:	Yes	/	No
i. Coughing that occurs mostly when you are lying down:	Yes	/	No
j. Coughing up blood in the last month:	Yes	/	No
k. Wheezing:	Yes	/	No
l. Wheezing that interferes with your job:	Yes	/	No
m. Chest pain when you breathe deeply:	Yes	/	No
n. Any other symptoms that you think may be related to lung problems:	Yes	/	No
5. Have you <i>ever had</i> any of the following cardiovascular or heart problems?	Yes	/	No
a. Heart attack:	Yes	/	No
b. Stroke:	Yes	/	No
c. Angina:	Yes	/	No
d. Heart failure:	Yes	/	No
e. Swelling in your legs or feet (not caused by walking):	Yes	/	No
f. Heart arrhythmia (heart beating irregularly):	Yes	/	No
g. High blood pressure:	Yes	/	No
h. Any other heart problem that you have been told about:	Yes	/	No
6. Have you <i>ever had</i> any of the following cardiovascular or heart symptoms?			
a. Frequent pain or tightness in your chest:	Yes	/	No
b. Pain or tightness in your chest during physical activity:	Yes	/	No
c. Pain or tightness in your chest that interferes with your job:	Yes	/	No
d. In the past 2 years, have you noticed your heart skipping or missing a beat:	Yes	/	No
e. Heartburn or indigestion that's not related to eating:	Yes	/	No
f. Any other symptoms that you think may be related to heart or circulation problems:	Yes	/	No
7. Do you <i>currently</i> take medication for any of the following problems?	Yes	/	No
a. Breathing or lung problems:	Yes	/	No
b. Heart trouble:	Yes	/	No
c. Blood pressure:	Yes	/	No
d. Seizures (fits):	Yes	/	No
8. If you have used a respirator, have you <i>ever had</i> any of the following problems? (If you have never used a respirator, check the following space and go to question 9): ____			
a. Eye irritation:	Yes	/	No
b. Skin allergies or rashes:	Yes	/	No
c. Anxiety:	Yes	/	No
d. General weakness or fatigue:	Yes	/	No
e. Any other problem that interferes with your use of a respirator?	Yes	/	No
9. Would you like to talk to the health care professional who will review this questionnaire about your answers?	Yes	/	No

Part 3 - Additional Questions for Users of Full-Facepiece Respirators or SCBAs

Please circle "Yes" or "No"

1. Have you <i>ever lost</i> vision in either eye (temporarily or permanently)?	Yes	/	No
2. Do you <i>currently</i> have any of these vision problems?			

a. Need to wear contact lenses:	Yes	/	No
b. Need to wear glasses:	Yes	/	No
c. Color blindness:	Yes	/	No
d. Any other eye or vision problem:	Yes	/	No
3. Have you <i>ever had</i> an injury to your ears, including a broken ear drum?	Yes	/	No
4. Do you <i>currently</i> have any of these hearing problems?			
a. Difficulty hearing:	Yes	/	No
b. Need to wear a hearing aid:	Yes	/	No
c. Any other hearing or ear problem:	Yes	/	No
5. Have you <i>ever had</i> a back injury?	Yes	/	No
6. Do you <i>currently</i> have any of the following musculoskeletal problems?			
a. Weakness in any of your arms, hands, legs, or feet:	Yes	/	No
b. Back pain:	Yes	/	No
c. Difficulty fully moving your arms and legs:	Yes	/	No
d. Pain or stiffness when you lean forward or backward at the waist:	Yes	/	No
e. Difficulty fully moving your head up or down:	Yes	/	No
f. Difficulty fully moving your head side to side:	Yes	/	No
g. Difficulty bending at your knees:	Yes	/	No
h. Difficulty squatting to the ground:	Yes	/	No
i. Climbing a flight of stairs or a ladder carrying more than 25 lbs:	Yes	/	No
j. Any other muscle or skeletal problem that interferes with using a respirator:	Yes	/	No

Part 4 - Discretionary Questions

Complete questions in this part ONLY IF your employer's health care provider says they are necessary

1. In your present job, are you working at high altitudes (over 5,000 feet) or in a place that has lower than normal amounts of oxygen?	Yes	/	No
If "yes," do you have feelings of dizziness, shortness of breath, pounding in your chest, or other symptoms when you are working under these conditions:	Yes	/	No
2. Have you ever been exposed (at work or home) to hazardous solvents, hazardous airborne chemicals (such as gases, fumes, or dust), OR have you come into skin contact with hazardous chemicals?	Yes	/	No
If "yes," name the chemicals, if you know them: _____			
3. Have you ever worked with any of the materials, or under any of the conditions, listed below:			
a. Asbestos?	Yes	/	No
b. Silica (for example, in sandblasting)?	Yes	/	No
c. Tungsten/cobalt (for example, grinding or welding this material)?	Yes	/	No
d. Beryllium?	Yes	/	No
e. Aluminum?	Yes	/	No
f. Coal (for example, mining)?	Yes	/	No
g. Iron?	Yes	/	No
h. Tin?	Yes	/	No
i. Dusty environments?	Yes	/	No
j. Any other hazardous exposures?	Yes	/	No
If "yes," describe these exposures: _____			
4. List any second jobs or side businesses you have: _____			
5. List your previous occupations: _____			
6. List your current and previous hobbies: _____			

7. Have you been in the military services?	Yes	/	No
If "yes," were you exposed to biological or chemical agents (either in training or combat)?	Yes	/	No
8. Have you ever worked on a HAZMAT team?	Yes	/	No
9. Other than medications for breathing and lung problems, heart trouble, blood pressure, and seizures mentioned earlier in this questionnaire, are you taking any other medications for any reason (including over-the-counter medications)?	Yes	/	No
If "yes," name the medications if you know them: _____			
10. Will you be using any of the following items with your respirator(s)?			
a. HEPA filters:	Yes	/	No
b. Canisters (for example, gas masks):	Yes	/	No
c. Cartridges:	Yes	/	No
11. How often are you expected to use the respirator(s)?			
a. Escape-only (no rescue):	Yes	/	No
b. Emergency rescue only:	Yes	/	No
c. Less than 5 hours <i>per week</i> :	Yes	/	No
d. Less than 2 hours <i>per day</i> :	Yes	/	No
e. 2 to 4 hours per day:	Yes	/	No
f. Over 4 hours per day:			
12. During the period you are using the respirator(s), is your work effort:			
a. <i>Light</i> (less than 200 kcal per hour):	Yes	/	No
If "yes," how long does this period last during the average shift: ____ hrs. ____ mins.			
Examples of a light work effort are sitting while writing, typing, drafting, or performing light assembly work; or standing while operating a drill press (1-3 lbs.) or controlling machines.			
b. <i>Moderate</i> (200 to 350 kcal per hour):	Yes	/	No
If "yes," how long does this period last during the average shift: ____ hrs. ____ mins.			
Examples of moderate work effort are sitting while nailing or filing; driving a truck or bus in urban traffic; standing while drilling, nailing, performing assembly work, or transferring a moderate load (about 35 lbs.) at trunk level; walking on a level surface about 2 mph or down a 5-degree grade about 3 mph; or pushing a wheelbarrow with a heavy load (about 100 lbs.) on a level surface.			
c. <i>Heavy</i> (above 350 kcal per hour):	Yes	/	No
If "yes," how long does this period last during the average shift: ____ hrs. ____ mins.			
Examples of heavy work are lifting a heavy load (about 50 lbs.) from the floor to your waist or shoulder; working on a loading dock; shoveling; standing while bricklaying or chipping castings; walking up an 8-degree grade about 2 mph; climbing stairs with a heavy load (about 50 lbs.).			
13. Will you be wearing protective clothing and/or equipment (other than the respirator) when you are using your respirator?	Yes	/	No
If "yes," describe this protective clothing and/or equipment: _____			
14. Will you be working under hot conditions (temperature exceeding 77°F):	Yes	/	No
15. Will you be working under humid conditions:	Yes	/	No
16. Describe the work you will be doing while using your respirator(s): _____			
17. Describe any special or hazardous conditions you might encounter when you are using your respirator(s) (for example, confined spaces, life-threatening gases): _____			
18. Provide the following information, if you know it, for each toxic substance that you will be exposed to when you are using your respirator(s):			

Name of the first toxic substance: _____
 Estimated maximum exposure level per shift: _____
 Duration of exposure per shift: _____
 Name of the second toxic substance: _____
 Estimated maximum exposure level per shift: _____
 Duration of exposure per shift: _____
 Name of the third toxic substance: _____
 Estimated maximum exposure level per shift: _____
 Duration of exposure per shift: _____
 The name of any other toxic substances that you will be exposed to while using your respirator: _____
 19. Describe any special responsibilities you will have while using your respirator(s) that may affect the safety and well-being of others (for example, rescue, security). _____

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-62010 Follow these fit-testing procedures for tight-fitting respirators.

IMPORTANT:

((*) 1. This section contains procedural requirements that apply during actual fit testing.

((*) 2. See WAC 296-307-606 of this part for fit-testing requirements that apply to ~~((you))~~ the employer's overall program.

Exemption(s): This section does **NOT** apply to employees who:

((*) 1. Voluntarily use respirators;

OR

((*) 2. Are required to use mouthpiece respirators.

~~((You must:~~

***) The employer must conduct fit testing according to all of the following:**

((-) (1) Follow the procedure in Table 11 to choose a respirator for fit testing:

((■) (a) Prior to conducting fit tests;

AND

((■) (b) Any time ~~((you))~~ an employee must select a different respirator such as when a previously selected respirator fails a test.

((-) (2) Select and follow at least one of the following fit test procedures:

((■) (a) Qualitative fit-test procedures:

((♦) (i) Isoamyl acetate vapor (IAA, banana oil) in Table 12;

((♦) (ii) Saccharine aerosol in Table 13;

((♦) (iii) Bitrex™ aerosol in Table 14;

((♦) (iv) Irritant smoke in Table 15;

((■) (b) Quantitative fit-test procedures:

((♦) (i) Ambient aerosol condensation nuclei counter such as the Portacount™, in Table 16;

((♦) (ii) Controlled negative pressure (CNP) such as the FitTester 3000™, in Table 17;

((♦) (iii) Generated aerosol in Table 18;

((-) (3) Make sure employees perform the appropriate fit-test exercises listed in Table 19.

((-) (4) Clean and maintain equipment according to the manufacturer's instructions.

((-) (5) Make sure during fit testing employees wear any safety equipment that could:

((■) (a) Interfere with respirator fit;

AND

((■) (b) Be worn in the workplace. For example, chemical splash goggles.

((-) (6) Check, prior to fit testing, for conditions that may interfere with the respirator seal or valve functions. If ~~((you))~~ the employer finds such conditions, do **NOT** conduct fit testing for that individual.

Note: Examples of conditions that may interfere with the respirator seal or valve functions include:

((*) 1. Moustache, stubble, sideburns, bangs, hairline, and other types of facial hair in areas where the respirator facepiece seals or that interfere with valve function;

((*) 2. Temple bars of corrective eyewear or headgear that extend through the face seal area.

Table 11

Procedure for Choosing a Respirator for Fit Testing	
1. Inform the employee:	<ul style="list-style-type: none"> • To choose the most comfortable respirator that provides an adequate fit • That each respirator sample represents a different size and, if more than one model is supplied, a different shape • That if fitted and used properly, the respirator chosen will provide adequate protection
2. Provide a mirror and show the employee how to:	<ul style="list-style-type: none"> • Put on the respirator • Position the respirator on the face • Set strap tension.
Note:	This instruction does NOT take the place of the employee's formal training since it is only a review.

Procedure for Choosing a Respirator for Fit Testing
<p>3. Review with the employee how to check for a comfortable fit around the nose, cheeks and other areas on the face.</p> <ul style="list-style-type: none"> • Tell the employee the respirator should be comfortable while talking or wearing eye protection. <p>4. Have the employee hold each facepiece against the face, taking enough time to compare the fit of each. The employee can then either:</p> <ul style="list-style-type: none"> • Reject any facepiece that clearly does not feel comfortable or fit adequately <p>OR</p> <ul style="list-style-type: none"> • Choose which facepiece is most acceptable and which is less acceptable, if any. <p>Note:</p> <ul style="list-style-type: none"> • Supply as many respirator models and sizes as needed to make sure the employee finds a respirator that's acceptable and fits correctly • To save time later, during this step note the more acceptable facepieces in case the one chosen fails the fit test or proves unacceptable later. <p>5. Have the employee wear the most acceptable respirator for AT LEAST 5 minutes to evaluate comfort and fit. Do ALL of the following during this time:</p> <ul style="list-style-type: none"> • Ask the employee to observe and comment about the comfort and fit: <ul style="list-style-type: none"> - Around the nose, cheeks, and other areas on the face - When talking or wearing eye protection • Have the employee put on the respirator and adjust the straps until they show proficiency • Evaluate the respirator's general fit by checking: <ul style="list-style-type: none"> - Proper chin placement - Properly tightened straps (do NOT over tighten) - Acceptable fit across the nose bridge - Respirator size; it must span the distance from nose to chin - To see if the respirator stays in position • Have the employee complete a successful seal check as specified in WAC 296-307-62020 of this chapter <ul style="list-style-type: none"> - Prior to the seal check they must settle the respirator on their face by taking a few slow deep breaths WHILE SLOWLY: <ul style="list-style-type: none"> ■ Moving their head from side-to-side AND ■ Up and down. <p>6. If the employee finds the respirator unacceptable, allow the employee to select another one and return to Step 5. Otherwise, proceed to Step 7.</p> <p>7. Before starting the fit test, you must:</p>

Procedure for Choosing a Respirator for Fit Testing
<ul style="list-style-type: none"> • Describe the fit test including screening procedures, employee responsibilities, and test exercises <p>AND</p> <ul style="list-style-type: none"> • Make sure the employee wears the respirator AT LEAST five minutes.

Table 12

Isoamyl Acetate (Banana Oil) Vapor Test Procedure
<p>Important:</p> <ul style="list-style-type: none"> • This is a qualitative fit-test (QLFT) procedure • The success of this test depends on preserving the employee's odor sensitivity to isoamyl acetate (IAA) vapor <ul style="list-style-type: none"> - Vapor accumulations in ambient air can decrease odor sensitivity. To prevent this: <ul style="list-style-type: none"> ■ Prepare ALL solutions in a location separate from screening and test areas ■ Conduct screening and tests in separate well-ventilated rooms. For example, use an exhaust fan or laboratory hood to prevent IAA vapor from accumulating in the room air - Always use odor-free water, for example, distilled or spring water that's 25°C (77°F). • Isoamyl acetate is also known as isopentyl acetate.
Screening Preparations
<p>Important:</p> <p>Odor threshold screening determines if the employee can detect weak concentrations of IAA vapor.</p> <ol style="list-style-type: none"> 1. Choose an appropriate location to conduct screening. <ul style="list-style-type: none"> • Conduct screening and tests in separate well-ventilated rooms. 2. Prepare a stock solution AT LEAST weekly as follows: <ul style="list-style-type: none"> • Add one milliliter (ml) of pure IAA to 800 ml of odor-free water in a one-liter glass jar with a metal lid using a measuring dropper or pipette • Seal the jar with the lid and shake it for 30 seconds • Clean the dropper or pipette. 3. Prepare the odor test solution daily as follows: <ul style="list-style-type: none"> • Add 0.4 ml from the stock solution to 500 ml of water in a one liter glass jar with a metal lid using a clean pipette or dropper • Seal the jar with the lid and shake it for 30 seconds • Let this solution stand for 2-3 minutes so the IAA concentration above the liquid reaches equilibrium • Label this jar so you know the contents but the employee cannot know its contents, for example, "1."

Isoamyl Acetate (Banana Oil) Vapor Test Procedure
<p>Note: To maintain the integrity of the test, use labels that peel off easily AND periodically switch the labels.</p> <p>4. Prepare a "test blank" solution as follows:</p> <ul style="list-style-type: none"> • Add 500 ml of odor-free water to a one liter glass jar with a metal lid • Seal the jar • Label the jar so you know the contents but the employee cannot know its contents. <p>5. Type or neatly print the following instructions on a card and place it on the table in front of the two test jars:</p> <p><i>"The purpose of this test is to find out if you can smell banana oil at a low concentration. While both jars contain water, one ALSO contains a small amount of banana oil.</i></p> <p><i>Make sure the lid is secure then pick up a jar and shake it for two seconds. Open the jar and sniff at the opening. Repeat this for the second jar.</i></p> <p><i>Tell the individual conducting the fit test which jar contains banana oil."</i></p>
Test Preparations
<p>6. Choose an appropriate location to conduct fit testing.</p> <ul style="list-style-type: none"> • Conduct screening and tests in separate well-ventilated rooms. <p>7. Assemble the fit test enclosure in the room.</p> <ul style="list-style-type: none"> • Invert a clear 55-gallon drum liner over a circular 2-foot diameter frame made of plywood or other light-weight rigid material OR construct a similar enclosure using plastic sheeting • Hang the frame with the plastic covering so the top of the enclosure is about six inches above the employee's head • Attach a small hook inside top center of the enclosure • Tape a copy of the test exercises (see Table 28) to the inside of the test enclosure where the employee can read it. <p>8. Have organic vapor cartridges or equivalent on hand for each employee's chosen respirator.</p> <p>9. Have ready a 6 x 5-inch piece of paper towel or other porous absorbent single-ply material AND 0.75 ml of pure IAA. Do NOT apply IAA yet.</p> <p>Note: As an alternative to using the paper towel, you may use an IAA test swab OR ampoule if it has been demonstrated to generate an equivalent test concentration.</p>
Screening

Isoamyl Acetate (Banana Oil) Vapor Test Procedure
<p>10. Have the employee, while NOT wearing a respirator, follow the instructions on the card provided.</p> <ul style="list-style-type: none"> • If the employee correctly identifies the jar containing IAA, proceed to conduct testing (Step 11) • If the employee is NOT able to correctly identify the jar containing IAA, you must STOP and use a different fit test protocol.
Test
<p>11. BEFORE entering the fit test room, have the employee attach cartridges, put on, properly adjust, and seal check the respirator. Have the employee enter the test enclosure.</p> <p>12. Wet the paper towel with 0.75 ml of pure IAA AND fold it in half.</p> <p>13. Pass the paper towel to the employee inside the enclosure AND instruct the employee to hang it on the hook at the top of the enclosure.</p> <p>14. Wait two minutes for the IAA vapor to fill the enclosure.</p> <ul style="list-style-type: none"> • While waiting, explain the fit test, including the purpose of the test exercises, the importance of cooperation, and that you must be informed if a banana-like odor is detected during the test • You may also demonstrate the test exercises. <p>15. Have the employee perform the appropriate fit-test exercises in Table 19.</p> <ul style="list-style-type: none"> • If the employee does NOT detect IAA while performing test exercises, the fit test has been PASSED. Proceed as follows: <ul style="list-style-type: none"> - BEFORE leaving the enclosure, have the employee break the respirator seal and inhale. If they detect IAA, the test is valid - When exiting the employee must remove the paper towel and give it to the individual conducting the fit test. This prevents IAA vapor from building up in the enclosure during subsequent tests - The individual conducting the fit test must keep used paper towels in a self-sealing plastic bag to prevent area contamination • If the employee detects IAA during any test exercise, the fit test has FAILED. STOP and have the employee do the following: <ul style="list-style-type: none"> - Quickly return to the selection room to remove the respirator. This avoids decreasing the employee's odor sensitivity - Select another respirator - Repeat screening and testing

Isoamyl Acetate (Banana Oil) Vapor Test Procedure
<ul style="list-style-type: none"> ■ At this stage, if the employee fails the screening part of this procedure, the employee can repeat it AFTER waiting at least five minutes for odor sensitivity to return.

Table 13

Saccharin Aerosol Test Procedure
Screening Preparations
<p>Important:</p> <ul style="list-style-type: none"> • This is a qualitative fit-test (QLFT) procedure • Taste threshold screening determines whether the employee being tested can detect the taste of saccharin <ul style="list-style-type: none"> - The employee must NOT eat, smoke, chew gum or drink anything but plain water for at least fifteen minutes BEFORE the fit test. Sweet foods or drink consumed before the test may make the employee unable to detect saccharin during screening - Nebulizers must be thoroughly rinsed in water and shaken dry: <ul style="list-style-type: none"> ■ Each morning and afternoon <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> ■ At least every four hours. <ul style="list-style-type: none"> • You may use commercially prepared solutions if they meet the requirements in this procedure. <p>1. Obtain a test enclosure (hood) that meets the following specifications:</p> <ul style="list-style-type: none"> • Twelve inches in diameter by fourteen inches tall • A clear front portion • Enough space inside to allow free movement of the head when a respirator is worn • A 3/4 inch (or 1.9 centimeter) hole to accommodate the nebulizer nozzle. The hole must line up in front of the wearer's nose and mouth. <p>Note:</p> <ul style="list-style-type: none"> • An enclosure similar to the 3M hood assembly, parts #FT 14 and #FT 15 combined, meets these specifications • This enclosure can also be used for testing. <p>2. Obtain and assemble two clean DeVilbiss Model 40 Inhalation Medication Nebulizers OR equivalent.</p> <p>3. Prepare the screening solution as follows:</p> <ul style="list-style-type: none"> • Dissolve 83.0 milligrams of sodium saccharin USP in 100 ml of warm distilled water <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> • IF you have already prepared the fit-test solution, you can make the screening solution by adding 1 ml of this solution to 100 ml of distilled water.

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<p>4. Add about 1 ml of the screening solution to one of the nebulizers.</p> <ul style="list-style-type: none"> • Mark this nebulizer to distinguish it from the one to be used for fit testing.
Test Preparations
<p>5. Prepare the fit-test solution as follows:</p> <ul style="list-style-type: none"> • Add 83.0 grams of sodium saccharin to 100 ml of warm water. <p>6. Add about 1 ml of the test solution to the second nebulizer.</p> <ul style="list-style-type: none"> • Mark this nebulizer to distinguish it from the one used for screening <p>7. Have particulate filters ready for the employee's chosen respirator or have filtering-facepiece respirators ready.</p>
Screening
<p>8. Have the employee, while NOT wearing a respirator, put on the test enclosure.</p> <p>9. Instruct the employee to:</p> <ul style="list-style-type: none"> • Breathe through a slightly open mouth with tongue extended during screening AND testing • Immediately report when a sweet taste is detected. <p>10. Insert the nebulizer into the front hole of the test enclosure AND administer saccharin as follows:</p> <ul style="list-style-type: none"> • Direct the nozzle away from the employee's nose and mouth • Complete 10 squeezes in rapid succession • Each time firmly squeeze the bulb so it collapses completely, then release and allow it to fully expand. <p>11. Ask the employee if a sweet taste is detected.</p> <ul style="list-style-type: none"> • IF YES, screening is completed. Proceed to conduct testing, Step 14, AFTER you: <ul style="list-style-type: none"> - Ask the employee to remember the taste for reference during the fit test - Note the employee's taste threshold as "10" regardless of the number of squeezes actually completed • IF NO, screening must continue. Proceed to Step 12. <p>12. Repeat with 10 more squeezes. Then follow Step 11 again; EXCEPT this time note the employee's taste threshold as "20" IF a sweet taste is reported.</p> <ul style="list-style-type: none"> • If a sweet taste is still NOT detected, repeat with 10 more squeezes and follow Step 11 one last time; EXCEPT this time note "30" for the taste threshold IF a sweet taste is reported. <p>13. If NO sweet taste is reported after 30 squeezes, you must STOP and choose a different fit-test protocol for the employee.</p>

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Test
<p>Important!</p> <ul style="list-style-type: none"> Periodically check nebulizers to make sure they do not clog during use. A test is NOT valid if the nebulizer is clogged at the end of the test. <p>14. Have the employee attach particulate filters, put on, properly adjust, and seal check the respirator. Have the employee put on the test enclosure (hood).</p> <p>15. Instruct the employee to immediately report if a sweet taste is detected.</p> <p>16. Insert the nebulizer into the front hole of the test enclosure AND administer the same number of squeezes, either 10, 20, or 30, as noted during screening.</p> <p>17. Have the employee perform the appropriate fit-test exercises as described in Table 19. During this step:</p> <ul style="list-style-type: none"> Replenish the aerosol in the hood EVERY 30 seconds using 1/2 the number of squeezes used in Step 16, either 5, 10, or 15 The employee must report if a sweet taste is detected: <ul style="list-style-type: none"> If NO saccharin is tasted, the test has been PASSED <ul style="list-style-type: none"> If saccharin is tasted the test has FAILED, have the employee select another respirator AND <ul style="list-style-type: none"> Repeat screening and testing.

Table 14

Bitrex™ Aerosol Test Procedure
<p>Important!</p> <ul style="list-style-type: none"> This is a qualitative fit-test (QLFT) procedure Bitrex™ (denatonium benzoate) is routinely used as a taste aversion agent in household liquids that children shouldn't drink and is endorsed by the American Medical Association, the National Safety Council, and the American Association of Poison Control Centers The employee must NOT eat, smoke, chew gum or drink anything but plain water for at least fifteen minutes BEFORE the fit test.
Screening Preparations
<p>Important!</p> <ul style="list-style-type: none"> Taste threshold screening determines whether the employee being tested can detect the taste of Bitrex™ Nebulizers must be thoroughly rinsed in water and shaken dry: <ul style="list-style-type: none"> Each morning and afternoon <p>OR</p>

Bitrex™ Aerosol Test Procedure
<ul style="list-style-type: none"> At least every four hours. You may use commercially prepared solutions if they meet the requirements in this procedure. <p>1. Obtain a test enclosure that meets the following specifications:</p> <ul style="list-style-type: none"> Twelve inches in diameter by fourteen inches tall A clear front portion Enough space inside the front to allow free movement of the head when a respirator is worn 3/4 inch (or 1.9 centimeter) hole to accommodate the nebulizer nozzle. The hole must line up in front of the wearer's nose and mouth. <p>Note:</p> <ul style="list-style-type: none"> An enclosure similar to the 3M hood assembly, parts #FT 14 and #FT 15 combined, meets these specifications This enclosure can also be used for testing. <p>2. Obtain and assemble two clean DeVilbiss Model 40 Inhalation Medication Nebulizers OR equivalent:</p> <p>3. Prepare the screening solution as follows:</p> <ul style="list-style-type: none"> Make up a 5% salt solution by dissolving 5.0 grams of salt (sodium chloride) into 100 ml of distilled water Dissolve 13.5 milligrams of Bitrex™ in the salt solution. <p>4. Add about 1 ml of the screening solution to one of the nebulizers.</p> <ul style="list-style-type: none"> Mark this nebulizer to distinguish it from the one to be used for fit testing.
Test Preparations
<p>5. Prepare the fit test solution.</p> <ul style="list-style-type: none"> Dissolve 10.0 grams of salt (sodium chloride) into 200 ml of distilled water Add 337.5 milligrams of Bitrex™ to the warmed salt solution. <p>6. Add about 1 ml of the test solution to the second nebulizer.</p> <ul style="list-style-type: none"> Mark this nebulizer to distinguish it from the one used for screening. <p>7. Have particulate filters ready for the employee's chosen respirator or have filtering-facepiece respirators ready.</p>
Screening
<p>Important:</p> <p>The employee must NOT eat, smoke, chew gum or drink anything but plain water for at least fifteen minutes BEFORE the screening and test</p> <p>8. Have the employee, while NOT wearing a respirator, put on the test enclosure.</p> <p>9. Instruct the employee to:</p>

Bitrex™ Aerosol Test Procedure
<ul style="list-style-type: none"> • Breathe through a slightly opened mouth with tongue extended during screening AND testing • Immediately report when a bitter taste is detected. <p>10. Insert the nebulizer into the front hole of the test enclosure AND administer Bitrex™ as follows:</p> <ul style="list-style-type: none"> • Direct the nozzle away from the employee's nose and mouth • Complete 10 squeezes in rapid succession • Each time firmly squeeze the bulb so it collapses completely, then release and allow it to fully expand. <p>11. Ask the employee whether a bitter taste is detected.</p> <ul style="list-style-type: none"> • If YES, screening is completed. Proceed to conduct testing, Step 14, AFTER you: <ul style="list-style-type: none"> - Ask the employee to remember the taste for reference during the fit test - Note the employee's taste threshold as "10," regardless of the number of squeezes actually completed • If NO, screening must continue. Proceed to Step 12. <p>12. Repeat with 10 more squeezes. Then follow Step 11 again; EXCEPT this time note the employee's taste threshold as "20" IF a bitter taste is reported.</p> <ul style="list-style-type: none"> • If a bitter taste is still NOT detected repeat with 10 more squeezes and follow Step 11 one last time; EXCEPT this time note "30" for the taste threshold IF a bitter taste is reported. <p>13. If NO bitter taste is reported after 30 squeezes, you must STOP and choose a different fit-test protocol for the employee.</p>
Test
<p>14. Have the employee attach particulate filters, put on, properly adjust, and seal check the respirator. Have the employee put on the test enclosure.</p> <p>15. Instruct the employee to:</p> <ul style="list-style-type: none"> • Breathe through a slightly opened mouth with tongue extended during screening AND testing • Immediately report when a bitter taste is detected. <p>16. Insert the nebulizer into the front hole of the test enclosure AND administer the same number of squeezes, either 10, 20, or 30, as noted during screening.</p> <p>17. Have the employee perform the appropriate fit-test exercises as described in Table 19. During this step:</p> <ul style="list-style-type: none"> • Replenish the aerosol in the hood EVERY 30 seconds using 1/2 the number of squeezes used in Step 16, either 5, 10, or 15 • The employee must report if a bitter taste is detected: <ul style="list-style-type: none"> - If NO Bitrex™ is tasted, the test has been PASSED

Bitrex™ Aerosol Test Procedure
<p>- If Bitrex™ is tasted the test has FAILED. Have the employee:</p> <ul style="list-style-type: none"> ■ Select another respirator <p>AND</p> <ul style="list-style-type: none"> ■ Repeat all screening and testing steps.

Table 15

Irritant Smoke (Stannic Chloride) Test Procedure
<p>Important:</p> <ul style="list-style-type: none"> • DO NOT USE A TEST ENCLOSURE OR HOOD FOR THIS FIT TEST! • This is a qualitative fit-test (QLFT) procedure • During this test an employee is exposed to irritating smoke containing hydrochloric acid produced by a stannic chloride ventilation smoke tube to detect leakage. The smoke will irritate eyes, lungs, and nasal passages • Employee sensitivity varies, and certain employees may respond more intensely than others exposed to irritant smoke. The individual conducting the fit test must take precautions to minimize the employees' exposure to irritant smoke • Conduct fit testing in an area with adequate ventilation to prevent exposure of the individual conducting the fit test and build-up of irritant smoke in the ambient air.
Screening AND Test Preparations
<p>Important:</p> <p>Sensitivity screening is necessary to determine whether the employee can detect a weak concentration of irritant smoke AND whether any gross facepiece leakage is detected.</p> <ol style="list-style-type: none"> 1. Obtain only stannic chloride (ventilation) smoke tubes, AND an aspirator squeeze bulb OR use a low-flow air pump set to deliver 200 milliliters of air flow per minute. 2. Equip the employee's chosen respirator with P100 series filters if a negative pressure air-purifying respirator will be tested. If a powered air-purifying respirator (PAPR) will be tested equip the respirator with high-efficiency particulate air (HEPA) filters.
Screening
<p>Important!</p> <p>When performing sensitivity screening checks use only the MINIMUM amount of smoke necessary to elicit a response from the employee.</p> <ol style="list-style-type: none"> 3. Advise the employee that the smoke can be irritating to eyes, lungs, and nasal passages AND instruct the employee to keep eyes closed while exposed.

Irritant Smoke (Stannic Chloride) Test Procedure
<p>4. Break both ends of the ventilation smoke tube AND fit a short piece of plastic tubing, for example, two-to-six inches of tygon tubing, over one end to prevent exposure to the sharp end of the tube. Connect the other end to an aspirator bulb or a low-flow air pump set to deliver a flow of 200 ml per minute.</p> <p>5. While the employee is NOT wearing a respirator, have the employee smell a weak concentration of irritant smoke to become familiar with its irritating properties.</p> <ul style="list-style-type: none"> • Carefully direct a small amount of irritant smoke toward the employee.
Test
<p>Test 6. Have the employee attach respirator filters, put on, adjust, and seal check the respirator without assistance. The employee must be proficient at these tasks.</p> <p>7. Remind the employee to keep eyes closed during testing.</p> <p>8. Direct a stream of irritant smoke toward the respirator's face seal area as follows:</p> <ul style="list-style-type: none"> • Begin at least 12 inches from the facepiece AND move the smoke around the whole perimeter of the mask • Gradually make two more passes around the perimeter of the facepiece, moving to within 6 inches of the respirator • STOP at any time the employee detects smoke in the facepiece. If this occurs a different respirator will need to be chosen and tested, beginning with sensitivity screening. <p>9. Have the employee perform appropriate fit-test exercises in Table 19 IF the employee has NOT had an involuntary response such as evidence of coughing, flinching, or other response, OR detected smoke in the facepiece.</p> <ul style="list-style-type: none"> • Continue to direct smoke from a distance of 6 inches around the facepiece perimeter <ul style="list-style-type: none"> - If smoke is detected at any time the test has FAILED. A different respirator must be chosen and tested, starting with sensitivity screening - If NO smoke is detected proceed to Step 10. <p>10. Have the employee remove the respirator AND perform another sensitivity screening check as follows:</p> <ul style="list-style-type: none"> • Continue to use the smoke tube used for fit testing • Carefully direct a SMALL amount of irritant smoke toward the employee <ul style="list-style-type: none"> - The test has been PASSED IF the employee responds to the smoke - The fit test is VOIDED IF the employee does NOT respond to the smoke.

Table 16

Ambient Aerosol Condensation Nuclei Counter (Portacount™) Test Procedure
<p>Important:</p> <ul style="list-style-type: none"> • This is a quantitative (QNFT) fit-test procedure • This method uses a particle counting instrument that measures and compares the particle concentration both inside and outside the respirator facepiece while the employee performs a series of test exercises • Particles in the ambient air are used as the test aerosol.
Test Preparations
<p>1. Obtain a test instrument such as a Portacount™.</p> <p>2. Have probed respirators available for each respirator model and size the employer uses, OR have a sampling adapter available if the employee's actual or chosen respirator will be tested.</p> <p>Note:</p> <ul style="list-style-type: none"> • A probed respirator has a special fitting installed on the facepiece designed to connect with the end of the test instrument's plastic sampling tube so that air samples can be taken inside the facepiece. Probed respirators can be obtained from the respirator manufacturer, or distributor, AND can only be used for fit-testing purposes • Contact TSI Inc., OR the respirator's manufacturer to obtain probed respirators or facepiece sampling adapters. <p>3. Follow the test instrument manufacturer's instructions for test preparation, including particle, zero, and system checks. Make sure the instrument's pass OR fail criterion is programmed to the following MINIMUM performance levels:</p> <ul style="list-style-type: none"> • For half-facepiece respirators, an overall minimum fit factor of 100 as a passing level • For full-facepiece respirators, an overall minimum fit factor of 500 as a passing level <p>4. Have high-efficiency particulate air (HEPA) filters, OR other respirator filters available that are capable of preventing significant penetration by particles generated by the test instrument such as, P100 or N95 series filters.</p> <ul style="list-style-type: none"> • If you'll use a sampling adapter instead of probed respirators be sure to have the correct type for the respirators chosen.
Test
<p>5. Properly attach the sampling line to the facepiece probe or sampling adapter.</p>

Ambient Aerosol Condensation Nuclei Counter (Portacount™) Test Procedure

6. Have the employee attach respirator filters, put on, properly adjust, and wear the respirator five minutes **BEFORE** the fit test. During this time you and the employee must evaluate the respirator's general fit by checking:

- Proper chin placement
- Properly tightened straps (do **NOT** over tighten)
- Acceptable fit across the nose bridge
- Respirator size. It must span the distance from nose to chin
- To see if the respirator stays in position.

Note:

Wearing the respirator for five minutes permits the employee to make certain the respirator is comfortable **AND** allows for purging of ambient particles trapped inside the facepiece.

7. Have the employee perform a seal check. Make sure the sampling line is crimped to avoid leakage during the seal check. If **NO** leakage is detected, proceed to Step 8. If leakage is detected:

- Determine the cause
- AND**
- If leakage is due to a poorly fitting facepiece, have the employee:
 - Choose another respirator size or model
- AND**
- Start again at Step 6.

8. Start the fit test cycle.

- Follow the manufacturer's instructions for operating the test instrument
- Have the employee perform the appropriate fit-test exercises in Table 19
 - The test instrument will automatically stop and calculate the overall fit factor. Use this result to determine whether or not the test is passed
 - The test has been **PASSED** if the overall fit factor is at least 100 for a half facepiece, **OR** 500 for a full facepiece
 - The test has **FAILED** if the overall fit factor is below 100 for a half facepiece or 500 for a full facepiece.

Note:

If the test has failed, have the employee select another respirator model or size following Table 11 **AND** repeat this procedure.

Table 17

Controlled Negative Pressure (CNP) Test Procedure

Important!

- This is a quantitative fit-test (QNFT) procedure
- This method determines respirator fit by measuring how much the facepiece leaks when it is subject to a slight negative pressure **AFTER** various premeasurement activities
- Measurements occur while employees remain still **AND** hold their breath for 10 seconds
- No test aerosols are used. Respirator cartridges aren't needed for this test.

Test Preparations

1. Make sure the individual conducting the fit test is thoroughly trained to perform this test.
2. Obtain a CNP test instrument such as a FitTester 3000™. Make sure:

- Defaults are set at:
 - -15mm (-0.58 inches) of water test pressure
- AND**
- A modeled inspiratory flow rate of 53.8 liters per minute
- It has an effective audio warning device that signals when employees fail to hold their breath.

Note:

- You are not required to obtain test recording and printing equipment such as computers **OR** printers. Hand recording results is acceptable
- To see default settings, check the instrument's "REDON protocol."

3. Obtain facepiece adapters appropriate for each test respirator.

Note:

- Adapters are either a one-piece (for SCBA facepieces), **OR** two-piece (for dual cartridge facepieces) device providing a manifold and breathing valve system. For positive pressure respirators, you will need to obtain an additional fitting, available from the respirator manufacturer, to convert the facepiece to negative pressure
- To obtain adapters, contact the CNP instrument's distributor, Occupational Health Dynamics, **OR** the respirator manufacturer.

Test

Important!

After the test, you must ask the employee about the comfort of the respirator **AND** if the respirator has become unacceptable, another size or model must be chosen and tested.

Controlled Negative Pressure (CNP) Test Procedure
<p>4. Explain the test procedure to the employee.</p> <p>5. Train the employee on how to hold a breath for at least 20 seconds.</p> <p>6. Prepare the respirator for the fit test as follows:</p> <ul style="list-style-type: none"> • Remove or prop open the inhalation valves. If a breathing tube is present, disconnect it • Replace cartridges, if present, with the manifold and breathing valve adapter <ul style="list-style-type: none"> - For positive pressure facepieces, mount the manufacturer's additional fitting followed by the manifold-breathing valve adapter • Connect the respirator to the CNP device according to the CNP instrument manufacturer's directions. <p>7. Have the employee put on, adjust, and seal check the respirator.</p> <p>8. Turn on the instrument AND have the employee stand and perform the fit-test exercises in Table 19.</p> <p>9. Interpret the test results:</p> <ul style="list-style-type: none"> • The test is PASSED IF the overall fit factor obtained is at least 100 for a half facepiece, or at least 500 for a full facepiece • The test has FAILED IF the fit factor is less than 100 for a half facepiece; 500 for a full facepiece <ul style="list-style-type: none"> - If the test has FAILED you must have the employee select another respirator model or size following the steps in Table 11 AND repeat this procedure, starting at Step 6.

Table 18

Generated Aerosol Test Procedure
<p>Important:</p> <ul style="list-style-type: none"> • This is a quantitative (QNFT) fit-test procedure • In this method, a test aerosol is used to challenge the facepiece seal while aerosol concentrations inside and outside the facepiece are measured during test exercises • Special equipment is needed to generate, disperse, detect, and measure test aerosols.
Test Preparations
<p>1. Test aerosol.</p> <ul style="list-style-type: none"> • Use a particulate, for example, corn oil, polyethylene glycol 400, di-2-ethyl hexyl sebacate, or sodium chloride. <p>2. Instrumentation.</p> <ul style="list-style-type: none"> • Do ALL the following: <ul style="list-style-type: none"> - Obtain and use aerosol generation, dilution, and measurement systems appropriate for particulates - Use an aerosol-generating instrument that will maintain test concentrations within a 10% variation - Select a sampling instrument that allows for a computer record or strip chart record to be created <ul style="list-style-type: none"> ■ The record must show the rise and fall of test agent concentration during each inhalation and exhalation at fit factors of at least 2000. <p>Note: Integrators, or computers that integrate the amount of test agent penetration leakage into the respirator for each exercise, may be used if a record of the readings is made.</p>

Generated Aerosol Test Procedure

- Minimize the time interval between the activity and the recording of the activity so you can clearly connect what you see to what is being recorded. For example, use a small diameter and length of sampling line.

3. Test enclosure.

• Do ALL the following:

- Make sure the enclosure is equipped and constructed to effectively:

- Maintain a uniform concentration of the test agent inside the enclosure. For example, the enclosure must be large enough to allow ALL employees freedom of movement during testing WITHOUT disturbing the test concentration or measurement instrument
- Keep the test agent from contaminating the air outside the enclosure. For example, use a HEPA filter to purify exhausted air
- Allow the individual conducting the fit test to view the employee during the test

- Make sure the tubing used to collect samples from the enclosure AND respirator is the same material, diameter, AND length. This makes the effect of aerosol loss caused by deposition in each sample line equal

- If sodium chloride is used, relative humidity inside the enclosure must be kept below 50%.

4. Prepare test respirators.

• Do ALL the following:

- Inspect test respirators regularly for missing parts AND damage

- Keep test respirators in proper working order

- Make sure in-mask sampling probes are:

- Designed and installed so the air sample will be drawn from the employee's breathing zone; midway between the nose and mouth

AND

- The probe extends inside the facepiece at least 1/4 inch

- Make sure sampling ports such as probes, or adapters on respirators are constructed and installed so they do NOT:

- Block air flow into the sampling line
- Leak
- Interfere with the respirator's fit or performance

• Have high efficiency particulate air (HEPA) filters OR P100 series filter available

- Replace filters when increased breathing resistance is detected OR when the test agent has altered the filter material's integrity.

Test

Important!

• Throughout the test, maintain the employee's exposure to any test agent below the established exposure limit. Exposures allowed must be based on exposure time and exposure limit duration

• If a single peak penetration exceeds 5% for half facepieces OR 1% for full facepieces:

- STOP the test

AND

- Have the employee select another respirator for testing.

5. Have the employee attach filters, put on, adjust, and seal check the respirator.

• Be sure to crimp the sampling line to avoid pressure leaks during the seal check

AND

• Have the employee adjust the respirator straps, without assistance, so the fit is comfortable. Do NOT over tighten.

6. **OPTIONAL Step.** To save time conduct a screening test to quickly identify poorly fitting respirators.

Note: You may use a qualitative screening test OR an ambient aerosol condensation nuclei counter instrument in the count mode.

Generated Aerosol Test Procedure

7. Make sure test aerosol concentration is reasonably stable.
 - If a canopy or shower curtain enclosure is used, determine stability of the test aerosol concentration **AFTER** the employee enters the enclosure.
8. Have the employee enter the test enclosure and connect the respirator to the sample lines.
9. Immediately after entering the enclosure measure test aerosol concentration inside the respirator.
 - Make sure the peak penetration does **NOT** exceed 5% for half facepieces, **OR** 1% for full facepieces.
10. Have employee perform the appropriate fit-test exercises in Table 19.
 - Do **NOT** adjust the respirator once exercises begin.
11. Calculate the overall fit factor as specified in Steps 12-13. The fit test is:
 - **PASSED IF** the minimum fit factor of 100 for half facepieces **OR** 500 for full facepieces is obtained
 - OR**
 - IF a passing fit factor is **NOT** obtained, the test has **FAILED** and you must have the employee select and test another respirator.

Calculations

Important!

- Do **NOT** count the grimace exercise measurements during these calculations
 - Take into account the limitations of instrument detection when determining fit factors.
12. Calculate individual fit factors for **EACH** exercise by applying the following:

Exercise fit factor (ffE) = $\frac{\text{Average test enclosure concentration}}{\text{Test aerosol concentration inside the respirator}}$

 - To determine the average test enclosure concentration use one of the following methods:
 - Arithmetic average of the concentration before and after each **test** (an average of two values per entire test)
 - Arithmetic average of concentration before and after each **exercise** (an average of two values per exercise)
 - True average measured continuously during the respirator sample
 - Determine the test aerosol concentration inside the respirator in one of the following ways:
 - Average peak penetration values. Determine aerosol penetration for each exercise by:
 - Using integrators or computers that calculate the actual test agent penetration
 - OR**
 - Average the peak heights shown on the strip chart recording, graph, or by computer integration
 - Maximum peak penetration. Use strip chart recordings to determine the highest peak penetration for each exercise and use this value
 - Area under the peaks. Use computerized integration or other appropriate calculations to integrate the area under individual peaks for each exercise.
 13. Using individual exercise fit factors (ffE) calculate the **overall fit factor** by doing **ALL** of the following:
 - Convert each exercise fit factor to a penetration value
 - Determine the average penetration value
 - Convert the average penetration value back to a fit factor
 - OR**
 - Use this equation to calculate the **overall fit factor**:

Generated Aerosol Test Procedure	
Overall fit factor =	$\frac{n}{1/ffE1 + 1/ffE2 + 1/ffE3 \dots + 1/ffEn}$

Table 19

Fit-Test Exercises			
Important:			
<ul style="list-style-type: none"> • This list applies when you use any fit test • Employees tested must perform ALL exercises marked with an "X" as described for the fit-test procedure used <ul style="list-style-type: none"> - Once exercises begin, any adjustments made void the test AND you must begin again - After test exercises are completed, you must ask the employee about the comfort of the respirator. If it has become unacceptable, have the employee choose another one for testing • When the controlled negative pressure procedure is used, STOP and repeat the test if the employee adjusts the respirator OR takes a breath and fails to hold it for 10 seconds • Controlled negative pressure tests conducted according to the method published in 29 C.F.R. 1910.134, Appendix A are an acceptable alternative to the method outlined below. 			
Description of Required Fit-Test Exercises	Fit-Test Procedures		
	Qualitative Procedures	Quantitative Procedures; EXCEPT the CNPP	Controlled Negative Pressure Procedure (CNPP)
<ul style="list-style-type: none"> • Normal breathing <ul style="list-style-type: none"> - Breathe normally, while standing for one minute 	X	X	
<ul style="list-style-type: none"> • Deep breathing <ul style="list-style-type: none"> - Breathe slowly and deeply while standing for one minute - Take caution to avoid hyperventilating 	X	X	
<ul style="list-style-type: none"> • Head side to side <ul style="list-style-type: none"> - Slowly turn head from side to side while standing for one minute, pausing at each extreme position to inhale - Be careful to NOT bump the respirator 	X	X	
<ul style="list-style-type: none"> • Head up and down <ul style="list-style-type: none"> - Slowly move head up and down while standing for one minute, inhaling in the up position - Be careful to NOT bump the respirator 	X	X	
<ul style="list-style-type: none"> • Talking <ul style="list-style-type: none"> - Talk slowly and loud enough to be heard clearly by the individual conducting fit testing for one minute. Choose ONE of the following: <ul style="list-style-type: none"> ■ Read from a prepared text such as the Rainbow Passage¹ ■ Count backward from 100 ■ Recite a memorized poem or song. 	X	X	
<ul style="list-style-type: none"> • Grimace <ul style="list-style-type: none"> - Smile or frown for fifteen seconds. 		X	
<ul style="list-style-type: none"> • Bending over 			

Fit-Test Exercises			
- Bend over to touch toes while standing. Repeat at a comfortable pace for one minute OR - Jog in place for one minute if the test enclosure, such as a hood, does not permit bending over	X	X	
• Normal breathing - Breathe normally while standing for one minute	X	X	
• Face forward - Premeasurement activity: Stand and breath normally, without talking - Measurement position: Face forward while holding breath for 10 seconds			X
• Bending over - Premeasurement activity: While standing, bend over to touch toes - Measurement position: Hold the bending position with face parallel to the floor while holding breath for 10 seconds			X
• Head shaking - Premeasurement activity: Vigorously shake head from side to side for 3 seconds while shouting or making the sound of "BRRRR" loudly - Measurement position: Face forward, while holding breath for 10 seconds			X
• Redon-1 - Premeasurement activity: Remove the respirator completely and put it back on - Measurement position: Face forward while holding breath for 10 seconds			X
• Redon-2 - Repeat the premeasurement activity and measurement position described in Redon-1			X

¹ The 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."

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-62015 Follow procedures established for cleaning and disinfecting respirators.

~~((You must:~~

•) The employer must follow the procedure in Table 20 for cleaning and disinfecting respirators.

**Table 20
Respirator Cleaning Procedure**

Step	Task
1.	Remove filters, cartridges, canisters, speaking diaphragms, demand and pressure valve assemblies, hoses, or any components recommended by the manufacturer. • Discard or repair any defective parts.
2.	Wash components in warm (43°C (110°F) maximum) water with a mild detergent or with a cleaner recommended by the manufacturer

Step	Task
	<ul style="list-style-type: none"> • A stiff bristle (not wire) brush may be used to help remove the dirt • If the detergent or cleaner does not contain a disinfecting agent, respirator components should be immersed for two minutes in one of the following: <ul style="list-style-type: none"> - A bleach solution (concentration of 50 parts per million of chlorine). Make this by adding approximately one milliliter of laundry bleach to one liter of water at 43°C (110°F) - A solution of iodine (50 parts per million iodine). Make this in two steps: <ul style="list-style-type: none"> ■ First, make a tincture of iodine by adding 6-8 grams of solid ammonium iodide and/or potassium iodide to 100 cc of 45% alcohol approximately ■ Second, add 0.8 milliliters of the tincture to one liter of water at 43°C (110°F) to get the final solution - Other commercially available cleansers of equivalent disinfectant quality when used as directed, if their use is recommended or approved by the respirator manufacturer.
3.	<p>Rinse components thoroughly in clean, warm (43°C (110°F) maximum), preferably, running water.</p> <p>Note: The importance of thorough rinsing cannot be overemphasized. Detergents or disinfectants that dry on facepieces could cause dermatitis. In addition, some disinfectants may cause deterioration of rubber or corrosion of metal parts, if not completely removed.</p>
4.	Drain components.
5.	Air-dry components or hand dry components with a clean, lint-free cloth.
6.	<p>Reassemble the facepiece components.</p> <ul style="list-style-type: none"> • Replace filters, cartridges, and canisters, if necessary (for testing).
7.	Test the respirator to make sure all components work properly.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-62020 Follow procedures established for seal checking respirators.

IMPORTANT:

~~((*)~~ 1. User seal checks are **NOT** a substitute for fit tests. See WAC 296-307-62010 for fit test procedures.

~~((You must~~ 2. The employer may use a seal check procedure recommended by the respirator manufacturer **INSTEAD** of the procedure outlined in Table 21 if ~~((you))~~ the employer can demonstrate the procedure is based on a scientific study that, for example, demonstrates the procedure effectively identifies respirators that fit poorly when put on or adjusted.

~~((You must~~

~~*)~~ The employer must make sure employees perform a user seal check as outlined in Table 21, **EACH TIME** the respirator is worn, to make sure the seal is adequate.

Table 21

User Seal Check Procedure
<p>Important information for employees:</p> <ul style="list-style-type: none"> • You need to conduct a seal check each time you put your respirator on BEFORE you enter the respirator use area. The purpose of a seal check is to make sure your respirator (which has been previously fit tested by your employer) is properly positioned on your face to prevent leakage during use and to detect functional problems

User Seal Check Procedure
<ul style="list-style-type: none"> • The procedure below has two parts; a positive pressure check and a negative pressure check. You must complete both parts each time. It should only take a few seconds to perform, once you learn it - If you cannot pass both parts, your respirator is NOT functioning properly, see your supervisor for further instruction.
<p>Positive pressure check:</p> <ol style="list-style-type: none"> 1. Remove exhalation valve cover, if removable. 2. Cover the exhalation valve completely with the palm of your hand WHILE exhaling gently to inflate the facepiece slightly. 3. The respirator facepiece should remain inflated (indicating a build-up of positive pressure and NO outward leakage). <ul style="list-style-type: none"> • If you detect NO leakage, replace the exhalation valve cover (if removed), and proceed to conduct the negative pressure check • If you detect evidence of leakage, reposition the respirator (after removing and inspecting it), and try the positive pressure check again.
<p>Negative pressure check:</p>

User Seal Check Procedure
<p>4. Completely cover the inhalation opening(s) on the cartridges or canister with the palm(s) of your hands WHILE inhaling gently to collapse the facepiece slightly.</p> <ul style="list-style-type: none"> • If you cannot use the palm(s) of your hands to effectively cover the inhalation openings on cartridges or canisters, you may use: <ul style="list-style-type: none"> - Filter seal(s) (if available) <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> - Thin rubber gloves. <p>5. Once the facepiece is collapsed, hold your breath for 10 seconds WHILE keeping the inhalation openings covered.</p> <p>6. The facepiece should remain slightly collapsed (indicating negative pressure and NO inward leakage).</p> <ul style="list-style-type: none"> • If you detect NO evidence of leakage, the tightness of the facepiece is considered adequate, the procedure is completed, and you may now use the respirator • If you detect leakage, reposition the respirator (after removing and inspecting it) and repeat BOTH the positive and negative fit checks.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-622 Definitions.

Air-purifying respirator (APR)₂ A respirator equipped with an air-purifying element such as a filter, cartridge, or canister, **OR** having a filtering facepiece, for example, a dust mask.

The element or filtering facepiece is designed to remove specific contaminants, such as particles, vapors, or gases, from air that passes through it.

Air-line respirator₂ An atmosphere-supplying respirator for which breathing air is drawn from a source separate from and not worn by the user, such as:

- ((★)) (a) A cylinder or a tank;
- ((★)) (b) A compressor;
- ((★)) (c) An uncontaminated environment.

Air supplied respirator (see air-line respirator)₂

Assigned protection factor (APF)₂ Indicates the expected level of workplace respiratory protection **WHEN** the respirator is:

- ((★)) (a) Functioning properly;

AND

- ((★)) (b) Fitted to the user;

AND

- ((★)) (c) Worn by trained individuals;

AND

((★)) (d) Used with the limitations specified on the NIOSH approval label.

Atmosphere-supplying respirator₂ A respirator that supplies the user with breathing air from sources, such as:

- ((★)) (a) A cylinder or a tank;
- ((★)) (b) A compressor;
- ((★)) (c) An uncontaminated environment.

Breathing air₂ Air supplied to an atmosphere-supplying respirator. This air meets the specifications found in WAC 296-307-616.

Canister or cartridge (air-purifying)₂ Part of an air-purifying respirator that consists of a container holding materials such as fiber, treated charcoal, or a combination of the two, that removes contaminants from the air passing through the cartridge or canister.

Cartridge respirator (see also air-purifying respirator)₂ An air-purifying respirator equipped with one or more cartridges. These respirators have a facepiece made from silicone, rubber **OR** other plastic-like materials.

Demand respirator₂ An atmosphere-supplying respirator that sends breathing air to the facepiece only when suction (negative pressure) is created inside the facepiece by inhalation. Demand respirators are "**negative pressure**" respirators.

Dust mask₂ A name used to refer to filtering-facepiece respirators. Dust masks may or may not be NIOSH certified. See filtering facepiece.

Emergency respirator₂ Respirators suitable for rescue, escape, or other activities during emergency situations.

Emergency situation₂ Any occurrence that could **OR** does result in a significant uncontrolled release of an airborne contaminant. Causes of emergency situations include, but are not limited to, equipment failure, rupture of containers, or failure of control equipment.

End-of-service-life indicator (ESLI)₂ A system that warns the air-purifying respirator user that cartridges or canisters must be changed. An example of an ESLI is a dot on the respirator cartridge that changes color.

Escape-only respirator₂ A respirator that can only be used to exit during emergencies. Look for this use limitation on the respirator's NIOSH approval label.

Exposed, or exposure₂ The contact an employee has with a toxic substance, harmful physical agent, or oxygen deficient condition. Exposure can occur through various routes of entry, such as inhalation, ingestion, skin contact, or skin absorption.

Filter₂ Fibrous material that removes dust, spray, mist, fume, fog, smoke particles, **OR** other aerosols from the air.

Filtering-facepiece respirator₂ A tight-fitting, half-facepiece, negative-pressure, particulate air-purifying respirator with the facepiece **MAINLY** composed of filter material. These respirators do not use cartridges or canisters and may have sealing surfaces composed of rubber, silicone or other plastic-like materials. They are sometimes referred to as "dust masks."

Fit factor₂ A number providing an estimate of fit for a particular respiratory inlet covering to a specific individual during quantitative fit testing.

Fit test (see also qualitative fit test and quantitative fit test)₂ Fit testing is an activity where the facepiece seal of a respirator is challenged, using a WISHA accepted procedure, to determine if the respirator provides an adequate seal.

Full-facepiece respirator₂ A tight-fitting respirator that covers the wearer's nose, mouth, and eyes.

Gas mask₂ An air-purifying respirator equipped with one or more canisters. These respirators have a facepiece made from silicone, rubber **OR** other plastic-like materials.

Half-facepiece respirator. A tight-fitting respirator that only covers the wearer's nose and mouth.

Helmet. The rigid part of a respirator that covers the wearer's head AND also provides head protection against impact or penetration.

High-efficiency particulate air filter (HEPA). A powered air purifying respirator (PAPR) filter that removes at least 99.97% of monodisperse dioctyl phthalate (DOP) particles with a mean particle diameter of 0.3 micrometer from contaminated air.

Note: Filters designated, under 42 C.F.R. Part 84, as an "N100," "R100," or "P100" provide the same filter efficiency (99.97%) as HEPA filters.

Hood. The part of a respirator that completely covers the wearer's head and neck AND may also cover some or all of the shoulders and torso.

Immediately dangerous to life or health (IDLH). An atmospheric condition that would:

(*) (a) Cause an immediate threat to life;

OR

(*) (b) Cause permanent or delayed adverse health effects;

OR

(*) (c) Interfere with an employee's ability to escape.

Licensed health care professional (LHCP). An individual whose legally permitted scope of medical practice allows him or her to provide **SOME OR ALL** of the health care services required for respirator users' medical evaluations.

Loose-fitting facepiece. A respiratory inlet covering that is designed to form a partial seal with the face.

Negative-pressure respirator. Any tight-fitting respirator in which the air pressure inside the facepiece is less than the air pressure outside the respirator during inhalation.

NIOSH. The National Institute for Occupational Safety and Health. NIOSH is the federal agency that certifies respirators for occupational use.

Oxygen deficient. An atmosphere with an oxygen content below 19.5% by volume.

Permissible exposure limit (PEL). Permissible exposure limits (PELs) are employee exposures to toxic substances or harmful agents that must not be exceeded. PELs are specified in applicable WISHA chapters.

Positive-pressure respirator. A respirator in which the air pressure inside the respiratory-inlet covering is greater than the air pressure outside the respirator.

Powered air-purifying respirators (PAPRs). An air-purifying respirator equipped with a blower that draws ambient air through cartridges or canisters. These respirators, as a group, are **NOT** classified as positive pressure respirators and must not be used as such.

Pressure-demand respirator. A positive-pressure atmosphere-supplying respirator that sends breathing air to the respiratory inlet covering when the positive pressure is reduced inside the facepiece by inhalation or leakage.

Qualitative fit test (QLFT). A test that determines the adequacy of respirator fit for an individual. The test relies on the employee's ability to detect a test substance. Test results are either "pass" or "fail."

Quantitative fit test (QNFT). A test that determines the adequacy of respirator fit for an individual. The test relies on

specialized equipment that performs numeric measurements of leakage into the respiratory inlet covering. Test results are used to calculate a "fit factor."

Respiratory hazard. Harmful airborne hazards and oxygen deficiency that are addressed in WAC 296-307-624, Identifying and controlling airborne hazards and oxygen deficiency.

Required use (~~Respirator use:~~

*) (**Respirator use**).

(a) That is necessary to protect employees from respiratory hazards;

OR

(*) (b) That the employer decides to require for his or her own reasons. For example, the employer decides to follow more rigorous exposure limits;

(*) (c) The employer for his or her own reasons. For example, the employer decides to follow more rigorous exposure limits, OR the employer is required to follow a medical recommendation.

Respirator. A type of personal protective equipment designed to protect the wearer from harmful airborne hazards, oxygen deficiency, or both.

Respiratory inlet covering. The part of a respirator that forms the protective barrier between the user's respiratory tract and an air-purifying device or breathing air source or both. The respiratory inlet covering may be a facepiece, helmet, hood, suit, or mouthpiece respirator with nose clamp.

Seal check. Actions conducted by the respirator user each time the respirator is put on, to determine if the respirator is properly seated on the face.

Self-contained breathing apparatus (SCBA). An atmosphere-supplying respirator designed for the breathing air source, to be carried by the user.

Service-life. The period of time that a respirator, filter or sorbent, or other respiratory equipment provides adequate protection to the wearer. For example, the period of time that sorbent cartridge is effective for removing a harmful substance from the air.

Sorbent. Rigid, porous material, such as charcoal, used to remove vapor or gas from the air.

Supplied-air respirator (see air-line respirator).

Tight-fitting facepiece. A respiratory inlet covering forming a complete seal with the face OR neck. Mouthpiece respirators aren't tight-fitting facepieces.

Voluntary use. Respirator use that is requested by the employee AND permitted by the employer when **NO** respiratory hazard exists.

AMENDATORY SECTION (Amending WSR 06-08-087, filed 4/4/06, effective 9/1/06)

WAC 296-307-624 Scope.

(1) This part applies **only** if (~~your~~) employees:

(*) (a) Are exposed to a respiratory hazard;

OR

(*) (b) Could be exposed to one of the specific hazards listed below.

(2) This part applies to any workplace with potential or actual employee exposure to respiratory hazards. It requires

~~((you))~~ the employer to protect employees from respiratory hazards by applying this protection strategy:

~~((*)~~ (a) Evaluate employee exposures to determine if controls are needed;

~~((*)~~ (b) Use feasible controls. For example, enclose or confine the operation, use ventilation systems, or substitute with less toxic material;

~~((*)~~ (c) Use respirators if controls are not feasible or if they cannot completely remove the hazard.

Definition(~~(*)~~).

Exposed or exposure(~~(*)~~). The contact an employee has with a toxic substance, harmful physical agent or oxygen deficient condition, whether or not protection is provided by respirators or other personal protective equipment (PPE). Exposure can occur through various routes of entry, such as inhalation, ingestion, skin contact, or skin absorption.

Note: Examples of substances that may be respiratory hazards when airborne include:

- ~~((*)~~ 1. Chemicals listed in Table 3.
 - ~~((*)~~ 2. Any substance;
 - ~~((-)~~ a. Listed in the latest edition of the NIOSH Registry of Toxic Effects of Chemical Substances;
 - ~~((-)~~ b. For which positive evidence of an acute or chronic health hazard exists through tests conducted by, or known to, the employer;
 - ~~((-)~~ c. That may pose a hazard to human health as stated on a material safety data sheet kept by, or known to, the employer.
 - ~~((*)~~ 3. Atmospheres considered oxygen deficient.
 - ~~((*)~~ 4. Biological agents such as harmful bacteria, viruses or fungi.
 - ~~((-)~~ Examples include airborne TB aerosols and anthrax.
 - ~~((*)~~ 5. Pesticides with a label requirement for respirator use.
 - ~~((*)~~ 6. Chemicals used as crowd control agents such as pepper spray.
 - ~~((*)~~ 7. Chemicals present at clandestine drug labs.
- These substances can be airborne as dusts, fibers, fogs, fumes, mists, gases, smoke, sprays, vapors, or aerosols.

References: ~~((*)~~ 1. Substances in Table 3 that are marked with an X in the "skin" column may require personal protective equipment (PPE). See WAC 296-307-100, Personal protective equipment, for additional information and requirements.

~~((*)~~ 2. If any of the following hazards are present in ~~((you))~~ the workplace, ~~((you))~~ the employer will need both this part and any of the following specific rules that apply:

Hazard

- a. Acrylonitrile;
- b. Arsenic (inorganic);
- c. Asbestos;
- d. Benzene;
- e. Butadiene;
- f. Cadmium;
- g. Carcinogens;
- h. Coke ovens;
- i. Cotton dust;

Hazard

- j. 1,2-Dibromo-3-chloropropane;
- k. Ethylene oxide;
- l. Formaldehyde;
- m. Lead;
- n. Methylene chloride;
- o. Methylenedianiline;
- p. Thiram;
- q. Vinyl chloride.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-626 Evaluate and control employee exposures.

~~((Summary:~~

~~you))~~ **Employer responsibility:**

To protect ~~((you))~~ employees from exposure to respiratory hazards in the workplace by identifying and controlling the hazards.

~~((You must:~~

~~Identify and evaluate employee exposures~~

~~WAC 296-307-62605~~

~~Control employee exposures~~

~~WAC 296-307-62610~~

~~Use respirators~~

~~WAC 296-307-62615~~

~~Notify employees~~

~~WAC 296-307-62620~~

~~Permissible exposure limits of air contaminants~~

~~WAC 296-307-62625.))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Identify and evaluate employee exposures.</u>	<u>WAC 296-307-62605</u>
<u>Control employee exposures.</u>	<u>WAC 296-307-62610</u>
<u>Use respirators.</u>	<u>WAC 296-307-62615</u>
<u>Notify employees.</u>	<u>WAC 296-307-62620</u>
<u>Permissible exposure limits of air contaminants.</u>	<u>WAC 296-307-62625</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-62605 Identify and evaluate respiratory hazards.

~~((You must:~~

~~*)~~ (1) The employer must make sure employees are protected from potentially hazardous exposure while ~~((you perform you))~~ the employer performs an evaluation.

~~((*)~~ (2) The employer must perform ~~((you))~~ the evaluation without considering the protection provided to employees by a respirator.

((*) (3) The employer must determine the form of the hazard, such as dust, mist, gas, oxygen deficiency, or biological agent.

((*) (4) The employer must make sure ((you)) to consider:

((-) (a) Potential emergency and rescue situations that may occur, such as equipment or power failures, uncontrolled chemical reactions, fire, explosion, or human error;

((-) (b) Workplace conditions such as work processes, types of material, control methods, work practices and environmental conditions.

((*) (5) The employer must determine or reasonably estimate whether any employee is or could be exposed to any of the following:

((-) (a) Any airborne substance above a permissible exposure limit (PEL) listed in Table 3;

((-) (b) A substance at or above the action level (AL) specified in the rule for that substance;

((-) (c) Any other respiratory hazard.

((*) (6) The employer must use any of the following to determine employee exposure:

((-) (a) Information that would allow an estimate of the level of employee exposure, such as MSDSs or pesticide labels, observations, measurements or calculations;

((-) (b) Data demonstrating that a particular product, material or activity cannot result in employee exposure at or above the AL or PEL;

((-) (c) Personal air samples that represent an employee's usual or worst case exposure for the entire shift.

Notes: ((*) 1. Rules for specific substances may contain additional requirements for determining employee exposure.

((*) 2. Use methods of sampling and analysis that have been validated by the laboratory performing the analysis.

((*) 3. Samples from a representative group of employees may be used for other employees performing the same work activities when the duration and level of exposure are similar.

~~((You must:~~

*) (7) The employer must consider the atmosphere to be immediately dangerous to life or health (IDLH) when ((you)) the employer cannot determine or reasonably estimate employee exposure;

((*) (8) The employer must make sure employee exposure, to 2 or more substances with additive health effects, is evaluated using this formula:

$$E_m = \frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n}$$

The symbol	Is the . . .
E	Equivalent exposure for the mixture. When the value of E is greater than 1, a respiratory hazard is present.
C	Concentration of a particular substance.
L	TWA, STEL, or ceiling for that substance from Table 3.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-62610 Control employee exposures.

~~((You must:~~

*) The employer must use feasible controls to protect employees from exposure to respiratory hazards by:

((-) (1) Reducing employee exposure to a level that removes the respiratory hazard, such as to a level below the permissible exposure limit (PEL) in Table 3;

OR

((-) (2) Reducing the exposure to the lowest achievable level, when the respiratory hazard cannot be removed.

Note: The following table gives ((you)) examples of control methods.

**Table 1
Examples of Possible Controls**

Control:	For example:
Using a different chemical (substitution)	<ul style="list-style-type: none"> Choose a chemical with a lower evaporation rate or vapor pressure. Choose a chemical without hazardous ingredients.
Changing a process to lessen emissions	<ul style="list-style-type: none"> Use hand rolling or paint dipping instead of paint spraying. Bolt items instead of welding them.
Separating employees from emissions areas and sources	<ul style="list-style-type: none"> Use control rooms. Build an enclosure around process machinery or other emissions sources. Automate a process.
Removing emissions at or near the source (local exhaust ventilation)	<ul style="list-style-type: none"> Install exhaust hoods or slots to capture emissions. Use an exhausted enclosure (like a blasting cabinet or laboratory hood).
Diluting and removing emissions in the work area (general exhaust ventilation)	<ul style="list-style-type: none"> Allow natural air movement to create an adequate airflow through an area. Use mechanical fans.
Modify work practices	<ul style="list-style-type: none"> Change the position of the worker relative to the work so fumes, vapors, or smoke do not go into their face.
Rotate employees - Some specific rules prohibit the use of this control method	<ul style="list-style-type: none"> Move employees to another job that is without exposure, on a schedule to keep their total exposure below the permissible exposure limit.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-62615 Use respirators.

~~((You must~~

•)) The employer must require employees to use respiratory protection when respiratory hazards have not been removed using feasible controls. For example, use respirators at any of the following times:

((-) (1) While controls are being evaluated or put in place;

((-) (2) When the respiratory hazard is not completely removed;

((-) (3) When controls are **not** feasible.

Reference: See WAC 296-307-594, Respirators, for respirator program requirements.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-62620 Notify employees.

~~((You must~~

•)) The employer must notify employees who are or may be exposed to respiratory hazards, as specified in Table 2.

Note: ((*) The notification may be provided either individually, to a group, or by posting of results in an appropriate location that's accessible to affected employees.

**Table 2
Notification Requirements**

Notify employees of:	As follows:
Any exposure result above a permissible exposure limit (PEL)	Within five business days, after the employee's exposure result is known to the employer
The corrective action being taken to reduce employee exposure to or below the PEL AND The schedule for completion of the corrective action and any reasons why exposures cannot be lowered to below the PEL	Within fifteen business days, after the employee's exposure result is known to the employer
An exposure to these substances: • Acrylonitrile • Arsenic (inorganic) • Asbestos • Benzene • Butadiene • Cadmium • Coke oven emissions	In writing, as specified in the rule specific to the substance

Notify employees of:	As follows:
<ul style="list-style-type: none"> • Cotton dust • 1,2-Dibromo-3-chloropropane • Ethylene oxide • Formaldehyde • Lead • Methylene chloride • Methylenedianiline • Vinyl chloride 	

AMENDATORY SECTION (Amending WSR 18-17-156, filed 8/21/18, effective 12/12/18)

WAC 296-307-62625 Permissible exposure limits of air contaminants.

IMPORTANT:

The following information applies to Table 3, Permissible Exposure Limits for Air Contaminants.

((*) 1. Exposure needs to be determined from personal air samples taken in the breathing zone or from monitoring representative of the employee's breathing zone.

((*) 2. Ppm refers to parts of vapor or gas per million parts of air by volume, at 25 degrees C and 760 mm Hg pressure.

((*) 3. Mg/m³ refers to milligrams of substance per cubic meter of air.

((*) 4. For a metal that is measured as the metal itself, only the CAS number for the metal is given. The CAS numbers for individual compounds of the metal are not provided. For more information about CAS registry numbers see the website: ((<http://www.cas.org>)) <https://www.cas.org>.

((*) 5. Time weighted averages (TWA₈) represent the maximum allowed average exposure for any 8-hour time period. For work periods longer than 8 hours the TWA₈ needs to be determined using the 8 continuous hours with the highest average concentration.

((*) 6. Short-term exposure limits (STEL) represent maximum allowed average exposure for any fifteen-minute period, unless another time period is noted in Table 3.

((*) 7. The ceiling represents the maximum allowed exposure for the shortest time period that can feasibly be measured.

((*) 8. An "X" in the "skin" column indicates the substance can be absorbed through the skin, either by airborne or direct contact.

((*) 9. Requirements for the use of gloves, coveralls, goggles, and other personal protective equipment can be found in WAC 296-307-100.

((*) 10. The respirable fraction of particulate is measured by sampling with a size-selector having the following characteristics:

Mean aerodynamic diameter in micrometers	Percent passing the selector
1	97
2	91
3	74
4	50

Mean aerodynamic diameter in micrometers	Percent passing the selector
5	30
6	17
7	9
8	5
10	1

Table 3 "Permissible Exposure Limits for Air Contaminants"

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
Abate (Temephos)	3383-96-8	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Acetaldehyde	75-07-0	100 ppm	150 ppm	—	—
Acetic acid	64-19-7	10 ppm	20 ppm	—	—
Acetic anhydride	108-24-7	—	—	5 ppm	—
Acetone	67-64-1	750 ppm	1,000 ppm	—	—
Acetonitrile	75-05-8	40 ppm	60 ppm	—	—
2-Acetylaminofluorene	53-96-3	—	—	—	—
Acetylene	74-86-2	Simple asphyxiant	—	—	—
Acetylene dichloride (1,2-Dichloroethylene)	540-59-0	200 ppm	250 ppm	—	—
Acetylene tetrabromide	79-27-6	1 ppm	3 ppm	—	—
Acetylsalicylic acid (Aspirin)	50-78-2	5 mg/m ³	10 mg/m ³	—	—
Acrolein	107-02-8	0.1 ppm	0.3 ppm	—	—
Acrylamide	79-06-1	0.03 mg/m ³	0.09 mg/m ³	—	X
Acrylic acid	79-10-7	10 ppm	20 ppm	—	X
Acrylonitrile (Vinyl cyanide)	107-13-1	2 ppm	10 ppm	—	—
Aldrin	309-00-2	0.25 mg/m ³	0.75 mg/m ³	—	X
Allyl alcohol	107-18-6	2 ppm	4 ppm	—	X
Allyl chloride	107-05-1	1 ppm	2 ppm	—	—
Allyl glycidyl ether (AGE)	106-92-3	5 ppm	10 ppm	—	—
Allyl propyl disulfide	2179-59-1	2 ppm	3 ppm	—	—
alpha-Alumina (Aluminum oxide)	1344-28-1	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Aluminum (as Al)	7429-90-5	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Pyro powders	—	5 mg/m ³	10 mg/m ³	—	—
Welding fumes	—	5 mg/m ³	10 mg/m ³	—	—
Soluble salts	—	2 mg/m ³	4 mg/m ³	—	—
Alkyls (NOC)	—	2 mg/m ³	4 mg/m ³	—	—
Aluminum oxide (Alundum, Corundum)	7429-90-5	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
4-Aminodiphenyl	92-67-1	—	—	—	—
2-Aminoethanol (Ethanolamine)	141-43-5	3 ppm	6 ppm	—	—
2-Aminopyridine	504-29-0	0.5 ppm	1.5 ppm	—	—
Amitrole	61-82-5	0.2 mg/m ³	0.6 mg/m ³	—	—
Ammonia	7664-41-7	25 ppm	35 ppm	—	—

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
Ammonium chloride, fume	12125-02-9	10 mg/m ³	20 mg/m ³	—	—
Ammonium sulfamate (Ammate)	7773-06-0	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5.0 mg/m ³	10 mg/m ³	—	—
n-Amyl acetate	628-63-7	100 ppm	150 ppm	—	—
sec-Amyl acetate	626-38-0	125 ppm	156 ppm	—	—
Aniline and homologues	62-53-3	2 ppm	4 ppm	—	X
Anisidine (o, p-isomers)	29191-52-4	0.1 ppm	0.3 ppm	—	X
Antimony and compounds (as Sb)	7440-36-0	0.5 mg/m ³	1.5 mg/m ³	—	—
ANTU (alpha Naphthyl thiourea)	86-88-4	0.3 mg/m ³	0.9 mg/m ³	—	—
Argon	7440-37-1	Simple asphyxiant	—	—	—
Arsenic, organic compounds (as As)	7440-38-2	0.2 mg/m ³	0.6 mg/m ³	—	—
Arsenic, inorganic compounds (as As) (when use is covered by WAC 296-62-07347)	7440-38-2	0.01 mg/m ³	—	—	—
Arsenic, inorganic compounds (as As) (when use is not covered by WAC 296-62-07347)	7440-38-2	0.2 mg/m ³	0.6 mg/m ³	—	—
Arsine	7784-42-1	0.05 ppm	0.15 ppm	—	—
Asbestos	—	—	—	—	—
Asphalt (Petroleum fumes)	8052-42-4	5 mg/m ³	10 mg/m ³	—	—
Atrazine	1912-24-9	5 mg/m ³	10 mg/m ³	—	—
Azinphos methyl (Guthion)	86-50-0	0.2 mg/m ³	0.6 mg/m ³	—	X
Azodrin (Monocrotophos)	6923-22-4	0.25 mg/m ³	0.75 mg/m ³	—	—
Barium, soluble compounds (as Ba)	7440-39-3	0.5 mg/m ³	1.5 mg/m ³	—	—
Barium sulfate	7727-43-7	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Baygon (Propoxur)	114-26-1	0.5 mg/m ³	1.5 mg/m ³	—	—
Benomyl	17804-35-2	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Benzene	71-43-2	1 ppm	5 ppm	—	—
Benzidine	92-87-5	—	—	—	—
p-Benzoquinone (Quinone)	106-51-4	0.1 ppm	0.3 ppm	—	—
Benzo(a) pyrene (Coal tar pitch volatiles)	65996-93-2	0.2 mg/m ³	0.6 mg/m ³	—	—
Benzoyl peroxide	94-36-0	5 mg/m ³	10 mg/m ³	—	—
Benzyl chloride	100-44-7	1 ppm	3 ppm	—	—
Beryllium and beryllium compounds (as Be) (see chapter 296-850 WAC)	7440-41-7	0.0002 mg/m ³	0.002 mg/m ³	—	—
Biphenyl (Diphenyl)	92-52-4	0.2 ppm	0.6 ppm	—	—
Bismuth telluride, undoped	1304-82-1	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Bismuth telluride, Se-doped	—	5 mg/m ³	10 mg/m ³	—	—
Borates, tetra, sodium salts	—	—	—	—	—
Anhydrous	1330-43-4	1 mg/m ³	3 mg/m ³	—	—
Decahydrate	1303-96-4	5 mg/m ³	10 mg/m ³	—	—
Pentahydrate	12179-04-3	1 mg/m ³	3 mg/m ³	—	—
Boron oxide	1303-86-2	—	—	—	—

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Boron tribromide	10294-33-4	—	—	1 ppm	—
Boron trifluoride	6737-07-2	—	—	1 ppm	—
Bromacil	314-40-9	1 ppm	3 ppm	—	—
Bromine	7726-95-6	0.1 ppm	0.3 ppm	—	—
Bromine pentafluoride	7789-30-2	0.1 ppm	0.3 ppm	—	—
Bromochloromethane (Chlorobromomethane)	74-97-5	200 ppm	250 ppm	—	—
Bromoform	15-25-2	0.5 ppm	1.5 ppm	—	X
Butadiene (1,3-butadiene)	106-99-0	1 ppm	5 ppm	—	—
Butane	106-97-8	800 ppm	1,000 ppm	—	—
Butanethiol (Butyl mercaptan)	109-79-5	0.5 ppm	1.5 ppm	—	—
2-Butanone (Methyl ethyl ketone)	78-93-3	200 ppm	300 ppm	—	—
2-Butoxy ethanol (Butyl cellosolve)	111-76-2	25 ppm	38 ppm	—	X
n-Butyl acetate	123-86-4	150 ppm	200 ppm	—	—
sec-Butyl acetate	105-46-4	200 ppm	250 ppm	—	—
tert-Butyl acetate	540-88-5	200 ppm	250 ppm	—	—
Butyl acrylate	141-32-2	10 ppm	20 ppm	—	—
n-Butyl alcohol	71-36-3	—	—	50 ppm	X
sec-Butyl alcohol	78-92-2	100 ppm	150 ppm	—	—
tert-Butyl alcohol	75-65-0	100 ppm	150 ppm	—	—
Butylamine	109-73-9	—	—	5 ppm	X
Butyl cellosolve (2-Butoxy ethanol)	111-76-2	25 ppm	38 ppm	—	—
tert-Butyl chromate (as CrOs)	1189-85-1	—	—	0.1 mg/m ³	X
n-Butyl glycidyl ether (BGE)	2426-08-6	25 ppm	38 ppm	—	—
n-Butyl lactate	138-22-7	5 ppm	10 ppm	—	—
Butyl mercaptan	109-79-5	0.5 ppm	1.5 ppm	—	—
o-sec-Butylphenol	89-72-5	5 ppm	10 ppm	—	X
p-tert-Butyl-toluene	98-51-1	10 ppm	20 ppm	—	—
Cadmium oxide fume (as Cd)	1306-19-0	0.005 mg/m ³	—	—	—
Cadmium dust and salts (as Cd)	7440-43-9	0.005 mg/m ³	—	—	—
Calcium arsenate	—	0.01 mg/m ³	—	—	—
Calcium carbonate	1317-65-3	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Calcium cyanamide	156-62-7	0.5 mg/m ³	1.5 mg/m ³	—	—
Calcium hydroxide	1305-62-0	5 mg/m ³	10 mg/m ³	—	—
Calcium oxide	1305-78-8	2 mg/m ³	4 mg/m ³	—	—
Calcium silicate	1344-95-2	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Calcium sulfate	7778-18-9	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Camphor (synthetic)	76-22-2	2 mg/m ³	4 mg/m ³	—	—
Caprolactam	105-60-2	—	—	—	—
Dust	—	1 mg/m ³	3 mg/m ³	—	—
Vapor	—	5 ppm	10 ppm	—	—
Captafol (Difolatan)	2425-06-1	0.1 mg/m ³	0.3 mg/m ³	—	X
Captan	133-06-2	5 mg/m ³	10 mg/m ³	—	—
Carbaryl (Sevin)	63-25-2	5 mg/m ³	10 mg/m ³	—	—

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
Carbofuran (Furadon)	1563-66-2	0.1 mg/m ³	0.3 mg/m ³	—	—
Carbon black	1333-86-4	3.5 mg/m ³	7 mg/m ³	—	—
Carbon dioxide	124-38-9	5,000 ppm	30,000 ppm	—	—
Carbon disulfide	75-15-0	4 ppm	12 ppm	—	X
Carbon monoxide	630-08-0	35 ppm	200 ppm (5 min.)	1,500 ppm	—
Carbon tetrabromide	558-13-4	0.1 ppm	0.3 ppm	—	—
Carbon tetrachloride (Tetrachloromethane)	56-23-5	2 ppm	4 ppm	—	X
Carbonyl chloride (Phosgene)	7803-51-2	0.1 ppm	0.3 ppm	—	—
Carbonyl fluoride	353-50-4	2 ppm	5 ppm	—	—
Catechol (Pyrocatechol)	120-80-9	5 ppm	10 ppm	—	X
Cellosolve acetate (2-Ethoxyethylacetate)	111-15-9	5 ppm	10 ppm	—	X
Cellulose (paper fiber)	9004-34-6	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Cesium hydroxide	21351-79-1	2 mg/m ³	4 mg/m ³	—	—
Chlordane	57-74-9	0.5 mg/m ³	1.5 mg/m ³	—	X
Chlorinated camphene (Toxaphen)	8001-35-2	0.5 mg/m ³	1 mg/m ³	—	X
Chlorinated diphenyl oxide	55720-99-5	0.5 mg/m ³	1.5 mg/m ³	—	—
Chlorine	7782-50-5	0.5 ppm	—	1 ppm	—
Chlorine dioxide	10049-04-4	0.1 ppm	0.3 ppm	—	—
Chlorine trifluoride	7790-91-2	—	—	0.1 ppm	—
Chloroacetaldehyde	107-20-0	—	—	1 ppm	—
a-Chloroacetophenone (Phenacyl chloride)	532-21-4	0.05 ppm	0.15 ppm	—	—
Chloroacetyl chloride	79-04-9	0.05 ppm	0.15 ppm	—	—
Chlorobenzene (Monochlorobenzene)	108-90-7	75 ppm	113 ppm	—	—
o-Chlorobenzylidene malonitrile (OCBM)	2698-41-1	—	—	0.05 ppm	X
Chlorobromomethane	74-97-5	200 ppm	250 ppm	—	—
2-Chloro-1, 3-butadiene (beta-Chloroprene)	126-99-8	10 ppm	20 ppm	—	X
Chlorodifluoromethane	75-45-6	1,000 ppm	1,250 ppm	—	—
Chlorodiphenyl (42% Chlorine) (PCB) (Polychlorobiphenyls)	53469-21-9	1 mg/m ³	3 mg/m ³	—	X
Chlorodiphenyl (54% Chlorine) (Polychlorobiphenyls (PCB))	11097-69-1	0.5 mg/m ³	1.5 mg/m ³	—	X
1-Chloro-2, 3-epoxypropane (Epichlorhydrin)	106-89-8	2 ppm	4 ppm	—	X
2-Chloroethanol (Ethylene chlorohydrin)	107-07-3	—	—	1 ppm	X
Chloroethylene (vinyl chloride)	75-01-4	1 ppm	5 ppm	—	—
Chloroform (Trichloromethane)	67-66-3	2 ppm	4 ppm	—	—
1-Chloro-1-nitropropane	600-25-9	2 ppm	4 ppm	—	—
bis-Chloromethyl ether	542-88-1	—	—	—	—
Chloromethyl methyl ether (Methyl chloromethyl ether)	107-30-2	—	—	—	—
Chloropentafluoroethane	76-15-3	1,000 ppm	1,250 ppm	—	—
Chloropicrin (Nitrotrichloromethane)	76-06-2	0.1 ppm	0.3 ppm	—	—
beta-Chloroprene (2-Chloro-1, 3-butadiene)	126-99-8	10 ppm	20 ppm	—	X
o-Chlorostyrene	2039-87-4	50 ppm	75 ppm	—	—
o-Chlorotoluene	95-49-8	50 ppm	75 ppm	—	—
2-Chloro-6-trichloromethyl pyridine (Nitrapyrin)	1929-82-4	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Chlorpyrifos	2921-88-2	0.2 mg/m ³	0.6 mg/m ³	—	X
Chromic acid and chromates (as CrO ₃)	Varies with compound	0.1 mg/m ³	0.3 mg/m ³	—	—
Chromium, soluble, chromic and chromous salts (as Cr)	7440-47-3	0.5 mg/m ³	1.5 mg/m ³	—	—
Chromium (VI) compounds (as Cr)	—	0.05 mg/m ³	0.15 mg/m ³	—	—
Chromium metal and insoluble salts	7440-47-3	0.5 mg/m ³	1.5 mg/m ³	—	—
Chromyl chloride	14977-61-8	0.025 ppm	0.075 ppm	—	—
Chrysene (Coal tar pitch volatiles)	65996-93-2	0.2 mg/m ³	0.6 mg/m ³	—	—
Clopidol	2971-90-6	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Coal dust (less than 5% SiO ₂)	—	—	—	—	—
Respirable fraction	—	2 mg/m ³	4 mg/m ³	—	—
Coal dust (greater than or equal to 5% SiO ₂)	—	—	—	—	—
Respirable fraction	—	0.1 mg/m ³	0.3 mg/m ³	—	—
Coal tar pitch volatiles (benzene soluble fraction) (Particulate polycyclic aromatic hydrocarbons)	65996-93-2	0.2 mg/m ³	0.6 mg/m ³	—	—
Cobalt, metal fume & dust (as Co)	7440-48-4	0.05 mg/m ³	0.15 mg/m ³	—	—
Cobalt carbonyl (as Co)	10210-68-1	0.1 mg/m ³	0.3 mg/m ³	—	—
Cobalt hydrocarbonyl (as Co)	16842-03-8	0.1 mg/m ³	0.3 mg/m ³	—	—
Coke oven emissions	—	0.15 mg/m ³	—	—	—
Copper (as Cu)	7440-50-8	—	—	—	—
Fume	—	0.1 mg/m ³	0.3 mg/m ³	—	—
Dusts and mists	—	1 mg/m ³	3 mg/m ³	—	—
Cotton dust (raw) (waste sorting, blending, cleaning, willowing and garetting)	—	1 mg/m ³	—	—	—
Corundum (Aluminum oxide)	7429-90-5	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Crag herbicide (Sesone, Sodium-2, 4-dichloro-phenoxyethyl sulfate)	136-78-7	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Cresol (all isomers)	1319-77-3	5 ppm	10 ppm	—	X
Crotonaldehyde	123-73-9; 4170-30-3	2 ppm	4 ppm	—	—
Crufomate	299-86-5	5 mg/m ³	10 mg/m ³	—	—
Cumene	98-82-8	50 ppm	75 ppm	—	X
Cyanamide	420-04-2	2 mg/m ³	4 mg/m ³	—	—
Cyanide (as CN)	Varies with compound	5 mg/m ³	10 mg/m ³	—	X
Cyanogen	460-19-5	10 ppm	20 ppm	—	—
Cyanogen chloride	506-77-4	—	—	0.3 ppm	—
Cyclohexane	110-82-7	300 ppm	375 ppm	—	—
Cyclohexanol	108-93-0	50 ppm	75 ppm	—	X
Cyclohexanone	108-94-1	25 ppm	38 ppm	—	X
Cyclohexene	110-83-8	300 ppm	375 ppm	—	—
Cyclohexylamine	108-91-8	10 ppm	20 ppm	—	—

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
Cyclonite (RDX)	121-82-4	1.5 mg/m ³	3.0 mg/m ³	—	X
Cyclopentadiene	542-92-7	75 ppm	113 ppm	—	—
Cyclopentane	287-92-3	600 ppm	750 ppm	—	—
Cyhexatin (Tricyclohexyltin hydroxide)	13121-70-5	5 mg/m ³	10 mg/m ³	—	—
2,4-D (Dichlorophenoxy-acetic acid)	94-75-7	10 mg/m ³	20 mg/m ³	—	—
DBCP (1,2-Dibromo-3-chloropropane)	96-12-8	0.001 ppm	—	0.005 ppm	—
DDT (Dichlorodiphenyltri-chloroethane)	50-29-3	1 mg/m ³	3 mg/m ³	—	X
DDVP, (Dichlorvos)	62-73-7	0.1 ppm	0.3 ppm	—	X
Dasanit (Fensulfothion)	115-90-2	0.1 mg/m ³	0.3 mg/m ³	—	—
Decaborane	17702-41-9	0.05 ppm	0.15 ppm	—	X
Demeton	8065-48-3	0.01 ppm	0.03 ppm	—	X
Diacetone alcohol (4-hydroxy-4-methyl-2-pentanone)	123-42-2	50 ppm	75 ppm	—	—
1, 2-Diaminoethane (Ethylenediamine)	107-15-3	10 ppm	20 ppm	—	—
Diazinon	333-41-5	0.1 mg/m ³	0.3 mg/m ³	—	X
Diazomethane	334-88-3	0.2 ppm	0.6 ppm	—	—
Diborane	19287-45-7	0.1 ppm	0.3 ppm	—	—
Dibrom (see Naled)	300-76-5	3 mg/m ³	6 mg/m ³	—	X
1, 2-Dibromo-3-chloropropane (DBCP)	96-12-8	0.001 ppm	—	0.005 ppm	—
2-N-Dibutylamino ethanol	102-81-8	2 ppm	4 ppm	—	X
Dibutyl phosphate	107-66-4	1 ppm	2 ppm	—	—
Dibutyl phthalate	84-74-2	5 mg/m ³	10 mg/m ³	—	—
Dichloroacetylene	7572-29-4	—	—	0.1 ppm	—
o-Dichlorobenzene	95-50-1	—	—	50 ppm	—
p-Dichlorobenzene	106-46-7	75 ppm	110 ppm	—	—
3, 3'-Dichlorobenzidine	91-94-1	—	—	—	—
Dichlorodiphenyltri-chloroethane (DDT)	50-29-3	1 mg/m ³	3 mg/m ³	—	X
Dichlorodifluoromethane	75-71-8	1,000 ppm	1,250 ppm	—	—
1, 3-Dichloro-5, 5-dimethyl hydantoin	118-52-5	0.2 mg/m ³	0.4 mg/m ³	—	—
1, 1-Dichloroethane (Ethylidene chloride)	75-34-3	100 ppm	150 ppm	—	—
1, 2-Dichloroethane (Ethylene dichloride)	107-06-2	1 ppm	2 ppm	—	—
1, 1-Dichloroethylene (Vinylidene chloride)	75-35-4	1 ppm	3 ppm	—	—
1, 2-Dichloroethylene (Acetylene dichloride)	540-59-0	200 ppm	250 ppm	—	—
Dichloroethyl ether	111-44-4	5 ppm	10 ppm	—	X
Dichlorofluoromethane	75-43-4	10 ppm	20 ppm	—	—
Dichloromethane (Methylene chloride)	75-09-2	25 ppm	125 ppm	—	—
1, 1-Dichloro-1-nitroethane	594-72-9	2 ppm	10 ppm	—	—
Dichlorophenoxyacetic acid (2, 4-D)	94-75-7	10 mg/m ³	20 mg/m ³	—	—
1, 2-Dichloropropane (Propylene dichloride)	78-87-5	75 ppm	110 ppm	—	—
Dichloropropene	542-75-6	1 ppm	3 ppm	—	X
2, 2-Dichloropropionic acid	75-99-0	1 ppm	3 ppm	—	—
Dichlorotetrafluoroethane	76-14-2	1,000 ppm	1,250 ppm	—	—
Dichlorvos (DDVP)	62-73-7	0.1 ppm	0.3 ppm	—	X
Dicrotophos	141-66-2	0.25 mg/m ³	0.75 mg/m ³	—	X
Dicyclopentadiene	77-73-6	5 ppm	10 ppm	—	—
Dicyclopentadienyl iron	102-54-5	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Dieldrin	60-57-1	0.25 mg/m ³	0.75 mg/m ³	—	X
Diethanolamine	111-42-2	3 ppm	6 ppm	—	—

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
Diethylamine	109-89-7	10 ppm	25 ppm	—	—
2-Diethylaminoethanol	100-37-8	10 ppm	20 ppm	—	X
Diethylene triamine	111-40-0	1 ppm	3 ppm	—	X
Diethyl ether (Ethyl ether)	60-29-7	400 ppm	500 ppm	—	—
Diethyl ketone	96-22-0	200 ppm	250 ppm	—	—
Diethyl phthalate	84-66-2	5 mg/m ³	10 mg/m ³	—	—
Difluorodibromomethane	75-61-6	100 ppm	150 ppm	—	—
Difolatan (Captafol)	2425-06-1	0.1 mg/m ³	0.3 mg/m ³	—	X
Diglycidyl ether (DGE)	2238-07-5	0.1 ppm	0.3 ppm	—	—
Dihydroxybenzene (Hydroquinone)	123-31-9	2 mg/m ³	4 mg/m ³	—	—
Diisobutyl ketone (2, 6-Dimethylheptanone)	108-83-8	25 ppm	38 ppm	—	—
Diisopropylamine	108-18-9	5 ppm	10 ppm	—	X
Dimethoxymethane (Methylal)	109-87-5	1,000 ppm	1,250 ppm	—	—
Dimethyl acetamide	127-19-5	10 ppm	20 ppm	—	X
Dimethylamine	124-40-3	10 ppm	20 ppm	—	—
4-Dimethylaminoazo benzene	60-11-7	—	—	—	—
Dimethylaminobenzene (Xylidene)	1300-73-8	2 ppm	4 ppm	—	X
Dimethylaniline (N, N-Dimethylaniline)	121-69-7	5 ppm	10 ppm	—	X
Dimethylbenzene (Xylene)	1300-73-8	100 ppm	150 ppm	—	—
Dimethyl-1, 2-dibromo-2, 2-dichloroethyl phosphate (Naled)	300-76-5	3 mg/m ³	6 mg/m ³	—	X
Dimethylformamide	68-12-2	10 ppm	20 ppm	—	X
2, 6-Dimethylheptanone (Diisobutyl ketone)	108-83-8	25 ppm	38 ppm	—	—
1, 1-Dimethylhydrazine	57-14-7	0.5 ppm	1.5 ppm	—	X
Dimethyl phthalate	131-11-3	5 mg/m ³	10 mg/m ³	—	—
Dimethyl sulfate	77-78-1	0.1 ppm	0.3 ppm	—	X
Dinitolmide (3, 5-Dinitro-o-toluamide)	148-01-6	5 mg/m ³	10 mg/m ³	—	—
Dinitrobenzene (all isomers - alpha, meta and para)	528-29-0; 99-65-0; 100-25-4	0.15 ppm	0.45 ppm	—	X
Dinitro-o-cresol	534-52-1	0.2 mg/m ³	0.6 mg/m ³	—	X
3, 5-Dinitro-o-toluamide (Dinitolmide)	148-01-6	5 mg/m ³	10 mg/m ³	—	—
Dinitrotoluene	25321-14-6	1.5 mg/m ³	3 mg/m ³	—	X
Dioxane (Diethylene dioxide)	123-91-1	25 ppm	38 ppm	—	X
Dioxathion	78-34-2	0.2 mg/m ³	0.6 mg/m ³	—	X
Diphenyl (Biphenyl)	92-52-4	0.2 ppm	0.6 ppm	—	—
Diphenylamine	122-39-4	10 mg/m ³	20 mg/m ³	—	—
Diphenylmethane diisocyanate (Methylene bisphenyl isocyanate (MDI))	101-68-8	—	—	0.02 ppm	—
Dipropylene glycol methyl ether	34590-94-8	100 ppm	150 ppm	—	X
Dipropyl ketone	123-19-3	50 ppm	75 ppm	—	—
Diquat	85-00-7	0.5 mg/m ³	1.5 mg/m ³	—	—
Di-sec, Octyl phthalate (Di-2-ethylhexylphthalate)	117-81-7	5 mg/m ³	10 mg/m ³	—	—
Disulfram	97-77-8	2 mg/m ³	4 mg/m ³	—	—
Disulfoton	298-04-4	0.1 mg/m ³	0.3 mg/m ³	—	X
2, 6-Di-tert-butyl-p-cresol	128-37-0	10 mg/m ³	20 mg/m ³	—	—
Diuron	330-54-1	10 mg/m ³	20 mg/m ³	—	—
Divinyl benzene	1321-74-0	10 ppm	20 ppm	—	—

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
Emery	12415-34-8	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Endosulfan (Thiodan)	115-29-7	0.1 mg/m ³	0.3 mg/m ³	—	X
Endrin	72-20-8	0.1 mg/m ³	0.3 mg/m ³	—	X
Epichlorhydrin (1-Chloro-2,3-epoxypropane)	106-89-8	2 ppm	4 ppm	—	X
EPN	2104-64-5	0.5 mg/m ³	1.5 mg/m ³	—	X
1, 2-Epoxypropane (Propylene oxide)	75-56-9	20 ppm	30 ppm	—	—
2, 3-Epoxy-1-propanol (Glycidol)	556-52-5	25 ppm	38 ppm	—	—
Ethane	—	Simple asphyxiant	—	—	—
Ethanethiol (Ethyl mercaptan)	75-08-1	0.5 ppm	1.5 ppm	—	—
Ethanol (Ethyl alcohol)	64-17-5	1,000 ppm	1,250 ppm	—	—
Ethanolamine (2-Aminoethanol)	141-43-5	3 ppm	6 ppm	—	—
Ethion	563-12-2	0.4 mg/m ³	1.2 mg/m ³	—	X
2-Ethoxyethanol (Glycol monoethyl ether)	110-80-5	5 ppm	10 ppm	—	X
2-Ethoxyethyl acetate (Cellosolve acetate)	111-15-9	5 ppm	10 ppm	—	X
Ethyl acetate	141-78-6	400 ppm	500 ppm	—	—
Ethyl acrylate	140-88-5	5 ppm	25 ppm	—	X
Ethyl alcohol (ethanol)	64-17-5	1,000 ppm	1,250 ppm	—	—
Ethylamine	75-04-07	10 ppm	20 ppm	—	—
Ethyl amyl ketone (5-Methyl-3-heptanone)	541-85-5	25 ppm	38 ppm	—	—
Ethyl benzene	100-41-4	100 ppm	125 ppm	—	—
Ethyl bromide	74-96-4	200 ppm	250 ppm	—	—
Ethyl butyl ketone (3-Heptanone)	106-35-4	50 ppm	75 ppm	—	—
Ethyl chloride	75-00-3	1,000 ppm	1,250 ppm	—	—
Ethylene	74-85-1	Simple asphyxiant	—	—	—
Ethylene chlorohydrin (2-Chloroethanol)	107-07-3	—	—	1 ppm	X
Ethylenediamine (1,2-Diaminoethane)	107-15-3	10 ppm	20 ppm	—	X
Ethylene dibromide	106-93-4	0.1 ppm	0.5 ppm	—	—
Ethylene dichloride (1,2-Dichloroethane)	107-06-2	1 ppm	2 ppm	—	—
Ethylene glycol	107-21-1	—	—	50 ppm	—
Ethylene glycol dinitrate	628-96-6	—	0.1 mg/m ³	—	X
Ethylene glycol monomethyl ether acetate (Methyl cellosolve acetate)	—	5 ppm	10 ppm	—	X
Ethyleneimine	151-56-4	—	—	—	X
Ethylene oxide	75-21-8	1 ppm	5 ppm	—	—
Ethyl ether (Diethyl ether)	60-29-7	400 ppm	500 ppm	—	—
Ethyl formate	109-94-4	100 ppm	125 ppm	—	—
Ethylidene chloride (1, 1-Dichloroethane)	107-06-2	1 ppm	2 ppm	—	—
Ethylidene norbornene	16219-75-3	—	—	5.0 ppm	—
Ethyl mercaptan (Ethanethiol)	75-08-1	0.5 ppm	1.5 ppm	—	—
n-Ethylmorpholine	100-74-3	5 ppm	10 ppm	—	X
Ethyl sec-amyl ketone (5-methyl-3-heptanone)	541-85-5	25 ppm	38 ppm	—	—
Ethyl silicate	78-10-4	10 ppm	20 ppm	—	—
Fenamiphos	22224-92-6	0.1 mg/m ³	0.3 mg/m ³	—	X
Fensulfothion (Dasanit)	115-90-2	0.1 mg/m ³	0.3 mg/m ³	—	—
Fenthion	55-38-9	0.2 mg/m ³	0.6 mg/m ³	—	X
Ferbam	—	—	—	—	—

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
Total particulate	14484-64-1	10 mg/m ³	20 mg/m ³	—	—
Ferrovandium dust	12604-58-9	1 mg/m ³	3 mg/m ³	—	—
Fluorides (as F)	Varies with compound	2.5 mg/m ³	5 mg/m ³	—	—
Fluorine	7782-41-4	0.1 ppm	0.3 ppm	—	—
Fluorotrichloromethane (see Trichlorofluoro methane)	75-69-4	—	—	1,000 ppm	—
Fonofos	944-22-9	0.1 mg/m ³	0.3 mg/m ³	—	X
Formaldehyde	50-00-0	0.75 ppm	2 ppm	—	—
Formamide	75-12-7	20 ppm	30 ppm	—	—
Formic acid	64-18-6	5 ppm	10 ppm	—	—
Furadon (carbofuran)	1563-66-2	0.1 mg/m ³	0.3 mg/m ³	—	—
Furfural	98-01-1	2 ppm	4 ppm	—	X
Furfuryl alcohol	98-00-0	10 ppm	15 ppm	—	X
Gasoline	8006-61-9	300 ppm	500 ppm	—	—
Germanium tetrahydride	7782-65-2	0.2 ppm	0.6 ppm	—	—
Glass, fibrous or dust	—	10 mg/m ³	20 mg/m ³	—	—
Gluteraldehyde	111-30-8	—	—	0.2 ppm	—
Glycerin mist	56-81-5	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Glycidol (2, 3-Epoxy-1-propanol)	556-52-5	25 ppm	38 ppm	—	—
Glycol monoethyl ether (2-Ethoxyethanol)	110-80-5	5 ppm	10 ppm	—	X
Grain dust (oat, wheat, barley)	—	10 mg/m ³	20 mg/m ³	—	—
Graphite, natural	7782-42-5	—	—	—	—
Respirable particulate	—	2.5 mg/m ³	5 mg/m ³	—	—
Graphite, synthetic	—	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Guthion (Azinphosmethyl)	86-50-0	0.2 mg/m ³	0.6 mg/m ³	—	X
Gypsum	13397-24-5	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Hafnium	7440-58-6	0.5 mg/m ³	1.5 mg/m ³	—	—
Helium	—	Simple asphyxiant	—	—	—
Heptachlor	76-44-8	0.5 mg/m ³	1.5 mg/m ³	—	X
Heptane (n-heptane)	142-82-5	400 ppm	500 ppm	—	—
2-Heptanone (Methyl n-amyl ketone)	110-43-0	50 ppm	75 ppm	—	—
3-Heptanone (Ethyl butyl ketone)	106-35-4	50 ppm	75 ppm	—	—
Hexachlorobutadiene	87-68-3	0.02 ppm	0.06 ppm	—	X
Hexachlorocyclopentadiene	77-47-4	0.01 ppm	0.03 ppm	—	—
Hexachloroethane	67-72-1	1 ppm	3 ppm	—	X
Hexachloronaphthalene	1335-87-1	0.2 mg/m ³	0.6 mg/m ³	—	X
Hexafluoroacetone	684-16-2	0.1 ppm	0.3 ppm	—	X
Hexane	—	—	—	—	—
n-hexane	110-54-3	50 ppm	75 ppm	—	—
other isomers	Varies with compound	500 ppm	1,000 ppm	—	—
2-Hexanone (Methyl-n-butyl ketone)	591-78-6	5 ppm	10 ppm	—	—
Hexone (Methyl isobutyl ketone)	108-10-1	50 ppm	75 ppm	—	—
sec-Hexyl acetate	108-84-9	50 ppm	75 ppm	—	—

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
Hexylene glycol	107-41-5	—	—	25 ppm	—
Hydrazine	302-01-2	0.1 ppm	0.3 ppm	—	X
Hydrogen	—	Simple asphyxiant	—	—	—
Hydrogenated terphenyls	61788-32-7	0.5 ppm	1.5 ppm	—	—
Hydrogen bromide	10035-10-6	—	—	3.0 ppm	—
Hydrogen chloride	7647-01-0	—	—	5.0 ppm	—
Hydrogen cyanide	74-90-8	—	4.7 ppm	—	X
Hydrogen fluoride	7664-39-3	—	—	3 ppm	—
Hydrogen peroxide	7722-84-1	1 ppm	3 ppm	—	—
Hydrogen selenide (as Se)	7783-07-5	0.05 ppm	0.15 ppm	—	—
Hydrogen sulfide	7783-06-4	10 ppm	15 ppm	—	—
Hydroquinone (Dihydroxybenzene)	123-31-9	2 mg/m ³	4 mg/m ³	—	—
4-Hydroxy-4-methyl-2-pentanone (Diacetone alcohol)	123-42-2	50 ppm	75 ppm	—	—
2-Hydroxypropyl acrylate	99-61-1	0.5 ppm	1.5 ppm	—	X
Indene	95-13-6	10 ppm	20 ppm	—	—
Indium and compounds (as In)	7440-74-6	0.1 mg/m ³	0.3 mg/m ³	—	—
Iodine	7553-56-2	—	—	0.1 ppm	—
Iodoform	75-47-8	0.6 ppm	1.8 ppm	—	—
Iron oxide dust and fume (as Fe)	1309-37-1	—	—	—	—
Total particulate	—	5 mg/m ³	10 mg/m ³	—	—
Iron pentacarbonyl (as Fe)	13463-40-6	0.1 ppm	0.2 ppm	—	—
Iron salts, soluble (as Fe)	Varies with compound	1 mg/m ³	3 mg/m ³	—	—
Isoamyl acetate	123-92-2	100 ppm	150 ppm	—	—
Isoamyl alcohol (primary and secondary)	123-51-3	100 ppm	125 ppm	—	—
Isobutyl acetate	110-19-0	150 ppm	188 ppm	—	—
Isobutyl alcohol	78-83-1	50 ppm	75 ppm	—	—
Isooctyl alcohol	26952-21-6	50 ppm	75 ppm	—	X
Isophorone	78-59-1	4 ppm	—	5 ppm	—
Isophorone diisocyanate	4098-71-9	0.005 ppm	0.02 ppm	—	X
Isopropoxyethanol	109-59-1	25 ppm	38 ppm	—	—
Isopropyl acetate	108-21-4	250 ppm	310 ppm	—	—
Isopropyl alcohol	67-63-0	400 ppm	500 ppm	—	—
Isopropylamine	75-31-0	5 ppm	10 ppm	—	—
N-Isopropylaniline	768-52-5	2 ppm	4 ppm	—	X
Isopropyl ether	108-20-3	250 ppm	313 ppm	—	—
Isopropyl glycidyl ether (IGE)	4016-14-2	50 ppm	75 ppm	—	—
Kaolin	—	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Ketene	463-51-4	0.5 mg/m ³	1.5 mg/m ³	—	—
Lannate (Methomyl)	16752-77-5	2.5 mg/m ³	5 mg/m ³	—	—
Lead, inorganic (as Pb)	7439-92-1	0.05 mg/m ³	—	—	—
Lead arsenate (as Pb)	3687-31-8	0.05 mg/m ³	—	—	—
Lead chromate (as Pb)	7758-97-6	0.05 mg/m ³	—	—	—
Limestone	1317-65-3	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Lindane	58-89-9	0.5 mg/m ³	1.5 mg/m ³	—	X
Lithium hydride	7580-67-8	0.025 mg/m ³	0.075 mg/m ³	—	—

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
L.P.G. (liquified petroleum gas)	68476-85-7	1,000 ppm	1,250 ppm	—	—
Magnesite	546-93-0	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Magnesium oxide fume	1309-48-4	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Malathion	121-75-5	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	X
Maleic anhydride	108-31-6	0.25 ppm	0.75 ppm	—	—
Manganese and compounds (as Mn)	7439-96-5	—	—	5 mg/m ³	—
Manganese cyclopentadienyl tricarbonyl (as Mn)	12079-65-1	0.1 mg/m ³	0.3 mg/m ³	—	X
Manganese tetroxide and fume (as Mn)	7439-96-5	1 mg/m ³	3 mg/m ³	—	—
Marble	1317-65-3	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
MBOCA (4, 4'-Methylene bis (2-chloro-aniline))	101-14-4	—	—	—	X
MDA (4, 4'-Methylene dianiline)	101-77-9	0.01 ppm	0.1 ppm	—	X
MDI (Methylene bisphenyl isocyanate) (Diphenylmethane diisocyanate)	101-68-8	—	—	0.02 ppm	—
MEK (Methyl ethyl ketone) (2-Butanone)	78-93-3	200 ppm	300 ppm	—	—
MEKP (Methyl ethyl ketone peroxide)	1338-23-4	—	—	0.2 ppm	—
Mercury (as Hg)	7439-97-6	—	—	—	—
Aryl and inorganic	—	0.1 mg/m ³	0.3 mg/m ³	—	X
Organo-alkyl compounds	—	0.01 mg/m ³	0.03 mg/m ³	—	X
Vapor	—	0.05 mg/m ³	0.15 mg/m ³	—	X
Mesityl oxide	141-79-7	15 ppm	25 ppm	—	—
Methacrylic acid	79-41-4	20 ppm	30 ppm	—	X
Methane	—	Simple asphyxiant	—	—	—
Methanethiol (Methyl mercaptan)	74-93-1	0.5 ppm	1.5 ppm	—	—
Methanol (Methyl alcohol)	67-56-1	200 ppm	250 ppm	—	X
Methomyl (lannate)	16752-77-5	2.5 mg/m ³	5 mg/m ³	—	—
Methoxychlor	72-43-5	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
2-Methoxyethanol (Methyl cellosolve)	109-86-4	5 ppm	10 ppm	—	X
2-Methoxyethyl acetate (Methyl cellosolve ace- tate)	110-49-6	5 ppm	10 ppm	—	X
4-Methoxyphenol	150-76-5	5 mg/m ³	10 mg/m ³	—	—
Methyl acetate	79-20-9	200 ppm	250 ppm	—	—
Methyl acetylene (propyne)	74-99-7	1,000 ppm	1,250 ppm	—	—
Methyl acetylene-propadiene mixture (MAPP)	—	1,000 ppm	1,250 ppm	—	—
Methyl acrylate	96-33-3	10 ppm	20 ppm	—	X
Methylacrylonitrile	126-98-7	1 ppm	3 ppm	—	X
Methylal (Dimethoxy-methane)	109-87-5	1,000 ppm	1,250 ppm	—	—
Methyl alcohol (methanol)	67-56-1	200 ppm	250 ppm	—	X
Methylamine	74-89-5	10 ppm	20 ppm	—	—
Methyl amyl alcohol (Methyl isobutyl carbinol)	108-11-2	25 ppm	40 ppm	—	X

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
Methyl n-amyl ketone (2-Heptanone)	110-43-0	50 ppm	75 ppm	—	—
N-Methyl aniline (Monomethyl aniline)	100-61-8	0.5 ppm	1.5 ppm	—	X
Methyl bromide	74-83-9	5 ppm	10 ppm	—	X
Methyl-n-butyl ketone (2-Hexanone)	591-78-6	5 ppm	10 ppm	—	—
Methyl cellosolve (2-Methoxyethanol)	109-86-4	5 ppm	10 ppm	—	X
Methyl cellosolve acetate (2-Methoxyethyl acetate)	110-49-6	5 ppm	10 ppm	—	X
Methyl chloride	74-87-3	50 ppm	100 ppm	—	—
Methyl chloroform (1, 1, 1-trichloroethane)	71-55-6	350 ppm	450 ppm	—	—
Methyl chloromethyl ether (chloromethyl methyl ether)	107-30-2	—	—	—	—
Methyl 2-cyanoacrylate	137-05-3	2 ppm	4 ppm	—	—
Methylcyclohexane	108-87-2	400 ppm	500 ppm	—	—
Methylcyclohexanol	25639-42-3	50 ppm	75 ppm	—	—
Methylcyclohexanone	583-60-8	50 ppm	75 ppm	—	X
Methylcyclopentadienyl manganese tricarbonyl (as Mn)	12108-13-3	0.2 mg/m ³	0.6 mg/m ³	—	X
Methyl demeton	8022-00-2	0.5 mg/m ³	1.5 mg/m ³	—	X
Methylene bisphenyl isocyanate (MDI) (Diphenylmethane diisocyanate)	101-68-8	—	—	0.02 ppm	—
4, 4'-Methylene bis (2-chloro-aniline) (MBOCA)	101-14-4	—	—	—	X
Methylene bis (4-cyclohexylisocyanate)	5124-30-1	—	—	0.01 ppm	—
Methylene chloride (Dichloromethane)	75-09-2	25 ppm	125 ppm	—	—
4, 4-Methylene dianiline (MDA)	101-77-9	0.01 ppm	0.1 ppm	—	X
Methyl ethyl ketone (MEK) (2-Butanone)	78-93-3	200 ppm	300 ppm	—	—
Methyl ethyl ketone peroxide (MEKP)	1338-23-4	—	—	0.2 ppm	—
Methyl formate	107-31-3	100 ppm	150 ppm	—	—
5-Methyl-3-heptanone (Ethyl amyl ketone)	541-85-5	25 ppm	38 ppm	—	—
Methyl hydrazine (Monomethyl hydrazine)	60-34-4	—	—	0.2 ppm	X
Methyl iodide	74-88-4	2 ppm	4 ppm	—	X
Methyl isoamyl ketone	110-12-3	50 ppm	75 ppm	—	—
Methyl isobutyl carbinol (Methyl amyl alcohol)	108-11-2	25 ppm	40 ppm	—	X
Methyl isobutyl ketone (Hexone)	108-10-1	50 ppm	75 ppm	—	—
Methyl isocyanate	624-83-9	0.02 ppm	0.06 ppm	—	X
Methyl isopropyl ketone	563-80-4	200 ppm	250 ppm	—	—
Methyl mercaptan (Methanethiol)	74-93-1	0.5 ppm	1.5 ppm	—	—
Methyl methacrylate	80-62-6	100 ppm	150 ppm	—	—
Methyl parathion	298-00-0	0.2 mg/m ³	0.6 mg/m ³	—	X
Methyl propyl ketone (2-Pentanone)	107-87-9	200 ppm	250 ppm	—	—
Methyl silicate	684-84-5	1 ppm	3 ppm	—	—
alpha-Methyl styrene	98-83-9	50 ppm	100 ppm	—	—
Mevinphos (Phosdrin)	7786-34-7	0.01 ppm	0.03 ppm	—	X
Metribuzin	21087-64-9	5 mg/m ³	10 mg/m ³	—	—
Mica (Silicates) Respirable fraction	12001-26-2	3 mg/m ³	6 mg/m ³	—	—
Molybdenum (as Mo)	7439-98-7	—	—	—	—
Soluble compounds	—	5 mg/m ³	10 mg/m ³	—	—
Insoluble compounds	—	10 mg/m ³	20 mg/m ³	—	—
Monochlorobenzene (Chlorobenzene)	108-90-7	75 ppm	113 ppm	—	—
Monocrotophos (Azodrin)	6923-22-4	0.25 mg/m ³	0.75 mg/m ³	—	—
Monomethyl aniline (N-Methyl aniline)	100-61-8	0.5 ppm	1.5 ppm	—	X

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
Monomethyl hydrazine	—	—	—	0.2 ppm	—
Morpholine	110-91-8	20 ppm	30 ppm	—	X
Naled (Dibrom)	300-76-5	3 mg/m ³	6 mg/m ³	—	X
Naphtha	8030-30-6	100 ppm	150 ppm	—	X
Naphthalene	91-20-3	10 ppm	15 ppm	—	—
alpha-Naphthylamine	134-32-7	—	—	—	—
beta-Naphthylamine	91-59-8	—	—	—	—
Neon	7440-01-9	Simple asphyxiant	—	—	—
Nickel carbonyl (as Ni)	13463-39-3	0.001 ppm	0.003 ppm	—	—
Nickel (as Ni)	7440-02-0	—	—	—	—
Metal and insoluble compounds	—	1 mg/m ³	3 mg/m ³	—	—
Soluble compounds	—	0.1 mg/m ³	0.3 mg/m ³	—	—
Nicotine	54-11-5	0.5 mg/m ³	1.5 mg/m ³	—	X
Nitrapyrin (2-Chloro-6 trichloromethyl pyridine)	1929-82-4	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Nitric acid	7697-37-2	2 ppm	4 ppm	—	—
Nitric oxide	10102-43-9	25 ppm	38 ppm	—	—
p-Nitroaniline	100-01-6	3 mg/m ³	6 mg/m ³	—	X
Nitrobenzene	98-95-3	1 ppm	3 ppm	—	X
4-Nitrobiphenyl	92-93-3	—	—	—	—
p-Nitrochlorobenzene	100-00-5	0.5 mg/m ³	1.5 mg/m ³	—	X
4-Nitrodiphenyl	—	—	—	—	—
Nitroethane	79-24-3	100 ppm	150 ppm	—	—
Nitrogen	7727-37-9	Simple asphyxiant	—	—	—
Nitrogen dioxide	10102-44-0	—	1 ppm	—	—
Nitrogen oxide (Nitrous oxide)	10024-97-2	50 ppm	75 ppm	—	—
Nitrogen trifluoride	7783-54-2	10 ppm	20 ppm	—	—
Nitroglycerin	55-63-0	—	0.1 mg/m ³	—	X
Nitromethane	75-52-5	100 ppm	150 ppm	—	—
1-Nitropropane	108-03-2	25 ppm	38 ppm	—	—
2-Nitropropane	79-46-9	10 ppm	20 ppm	—	—
N-Nitrosodimethylamine	62-75-9	—	—	—	—
Nitrotoluene	—	—	—	—	—
o-isomer	88-72-2	2 ppm	4 ppm	—	X
m-isomer	98-08-2	2 ppm	4 ppm	—	X
p-isomer	99-99-0	2 ppm	4 ppm	—	X
Nitrotrichloromethane (Chloropicrin)	76-06-2	0.1 ppm	0.3 ppm	—	—
Nitrous oxide (Nitrogen oxide)	10024-97-2	50 ppm	75 ppm	—	—
Nonane	111-84-2	200 ppm	250 ppm	—	—
Octachloronaphthalene	2234-13-1	0.1 mg/m ³	0.3 mg/m ³	—	X
Octane	111-65-9	300 ppm	375 ppm	—	—
Oil mist mineral (particulate)	8012-95-1	5 mg/m ³	10 mg/m ³	—	—
Osmium tetroxide (as Os)	20816-12-0	0.0002 ppm	0.0006 ppm	—	—
Oxalic acid	144-62-7	1 mg/m ³	2 mg/m ³	—	—
Oxygen difluoride	7783-41-7	—	—	0.05 ppm	—
Ozone	10028-15-6	0.1 ppm	0.3 ppm	—	—
Paper fiber (Cellulose)	9004-34-6	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
Paraffin wax fume	8002-74-2	2 mg/m ³	4 mg/m ³	—	—
Paraquat	—	—	—	—	—
Respirable fraction	4685-14-7 1910-42-5 2074-50-2	0.1 mg/m ³	0.3 mg/m ³	—	X
Parathion	56-38-2	0.1 mg/m ³	0.3 mg/m ³	—	X
Particulate polycyclic aromatic hydrocarbons (benzene soluble fraction) (coal tar pitch volatiles)	65996-93-2	0.2 mg/m ³	0.6 mg/m ³	—	—
Particulates not otherwise regulated	—	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Pentaborane	19624-22-7	0.005 ppm	0.015 ppm	—	—
Pentachloronaphthalene	1321-64-8	0.5 mg/m ³	1.5 mg/m ³	—	X
Pentachlorophenol	87-86-5	0.5 mg/m ³	1.5 mg/m ³	—	X
Pentaerythritol	115-77-5	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Pentane	109-66-0	600 ppm	750 ppm	—	—
2-Pentanone (methyl propyl ketone)	107-87-9	200 ppm	250 ppm	—	—
Perchloroethylene (tetrachloroethylene)	127-18-4	25 ppm	38 ppm	—	—
Perchloromethyl mercaptan	594-42-3	0.1 ppm	0.3 ppm	—	—
Perchloryl fluoride	7616-94-6	3 ppm	6 ppm	—	—
Perlite	—	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Petroleum distillates (Naptha, rubber solvent)	—	100 ppm	150 ppm	—	—
Phenacyl chloride (a-Chloroacetophenone)	532-21-4	0.05 ppm	0.15 ppm	—	—
Phenol	108-95-2	5 ppm	10 ppm	—	X
Phenothiazine	92-84-2	5 mg/m ³	10 mg/m ³	—	X
p-Phenylene diamine	106-50-3	0.1 mg/m ³	0.3 mg/m ³	—	X
Phenyl ether (vapor)	101-84-8	1 ppm	3 ppm	—	—
Phenyl ether-diphenyl mixture (vapor)	—	1 ppm	3 ppm	—	—
Phenylethylene (Styrene)	100-42-5	50 ppm	100 ppm	—	—
Phenyl glycidyl ether (PGE)	122-60-1	1 ppm	3 ppm	—	—
Phenylhydrazine	100-63-0	5 ppm	10 ppm	—	X
Phenyl mercaptan	108-98-5	0.5 ppm	1.5 ppm	—	—
Phenylphosphine	638-21-1	—	—	0.05 ppm	—
Phorate	298-02-2	0.05 mg/m ³	0.2 mg/m ³	—	X
Phosdrin (Mevinphos)	7786-34-7	0.01 ppm	0.03 ppm	—	X
Phosgene (carbonyl chloride)	75-44-5	0.1 ppm	0.3 ppm	—	—
Phosphine	7803-51-2	0.3 ppm	1 ppm	—	—
Phosphoric acid	7664-38-2	1 mg/m ³	3 mg/m ³	—	—
Phosphorus (yellow)	7723-14-0	0.1 mg/m ³	0.3 mg/m ³	—	—
Phosphorous oxychloride	10025-87-3	0.1 ppm	0.3 ppm	—	—
Phosphorus pentachloride	10026-13-8	0.1 ppm	0.3 ppm	—	—
Phosphorus pentasulfide	1314-80-3	1 mg/m ³	3 mg/m ³	—	—
Phosphorus trichloride	12-2-19	0.2 ppm	0.5 ppm	—	—
Phthalic anhydride	85-44-9	1 ppm	3 ppm	—	—

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
m-Phthalodinitrile	626-17-5	5 mg/m ³	10 mg/m ³	—	—
Picloram	1918-02-1	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Picric acid (2, 4, 6-Trinitrophenol)	88-89-1	0.1 mg/m ³	0.3 mg/m ³	—	X
Pindone (2-Pivalyl-1, 3-indandione, Pival)	83-26-1	0.1 mg/m ³	0.3 mg/m ³	—	—
Piperazine dihydrochloride	142-64-3	5 mg/m ³	10 mg/m ³	—	—
Pival (Pindone)	83-26-1	0.1 mg/m ³	0.3 mg/m ³	—	—
Plaster of Paris	26499-65-0	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Platinum (as Pt)	7440-06-4	—	—	—	—
Metal	—	1 mg/m ³	3 mg/m ³	—	—
Soluble salts	—	0.002 mg/m ³	0.006 mg/m ³	—	—
Polychlorobiphenyls (Chlorodiphenyls)	—	—	—	—	—
42% Chlorine (PCB)	53469-21-9	1 mg/m ³	3 mg/m ³	—	X
54% Chlorine (PCB)	11097-69-1	0.5 mg/m ³	1.5 mg/m ³	—	X
Portland cement	65997-15-1	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Potassium hydroxide	1310-58-3	—	—	2 mg/m ³	—
Propane	74-98-6	1,000 ppm	1,250 ppm	—	—
Propargyl alcohol	107-19-7	1 ppm	3 ppm	—	X
beta-Propiolactone	57-57-8	—	—	—	—
Propionic acid	79-09-4	10 ppm	20 ppm	—	—
Propoxur (Baygon)	114-26-1	0.5 mg/m ³	1.5 mg/m ³	—	—
n-Propyl acetate	109-60-4	200 ppm	250 ppm	—	—
n-Propyl alcohol	71-23-8	200 ppm	250 ppm	—	X
n-Propyl nitrate	627-13-4	25 ppm	40 ppm	—	—
Propylene	—	Simple asphyxiant	—	—	—
Propylene dichloride (1, 2-Dichloropropane)	78-87-5	75 ppm	110 ppm	—	—
Propylene glycol dinitrate	6423-43-4	0.05 ppm	0.15 ppm	—	X
Propylene glycol monomethyl ether	107-98-2	100 ppm	150 ppm	—	—
Propylene imine	75-55-8	2 ppm	4 ppm	—	X
Propylene oxide (1,2-Epoxypropane)	75-56-9	20 ppm	30 ppm	—	—
Propyne (Methyl acetylene)	74-99-7	1,000 ppm	1,250 ppm	—	—
Pyrethrum	8003-34-7	5 mg/m ³	10 mg/m ³	—	—
Pyridine	110-86-1	5 ppm	10 ppm	—	—
Pyrocatachol (Catechol)	120-80-9	5 ppm	10 ppm	—	X
Quinone (p-Benzoquinone)	106-51-4	0.1 ppm	0.3 ppm	—	—
RDX (Cyclonite)	—	1.5 mg/m ³	3 mg/m ³	—	X
Resorcinol	108-46-3	10 ppm	20 ppm	—	—
Rhodium (as Rh)	7440-16-6	—	—	—	—
Insoluble compounds, metal fumes and dusts	—	0.1 mg/m ³	0.3 mg/m ³	—	—
Soluble compounds, salts	—	0.001 mg/m ³	0.003 mg/m ³	—	—
Ronnel	299-84-3	10 mg/m ³	20 mg/m ³	—	—

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
Rosin core solder, pyrolysis products (as formaldehyde)	8050-09-7	0.1 mg/m ³	0.3 mg/m ³	—	—
Rotenone	83-79-4	5 mg/m ³	10 mg/m ³	—	—
Rouge	—	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Rubber solvent (naphtha)	8030-30-6	100 ppm	150 ppm	—	—
Selenium compounds (as Se)	7782-49-2	0.2 mg/m ³	0.6 mg/m ³	—	—
Selenium hexafluoride (as Se)	7783-79-1	0.05 ppm	0.15 ppm	—	—
Sesone (Crag herbicide)	136-78-7	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Sevin (Carbaryl)	63-25-2	5 mg/m ³	10 mg/m ³	—	—
Silane (see Silicon tetrahydride)	7803-62-5	5 ppm	10 ppm	—	—
Silica, amorphous, precipitated and gel	112926-00-8	6 mg/m ³	12 mg/m ³	—	—
Silica, amorphous, diatomaceous earth, containing less than 1% crystalline silica	61790-53-2	—	—	—	—
Total particulate	—	6 mg/m ³	12 mg/m ³	—	—
Respirable fraction	—	3 mg/m ³	6 mg/m ³	—	—
Silica, crystalline cristobalite	—	—	—	—	—
Respirable fraction	14464-46-1	0.05 mg/m ³	0.15 mg/m ³	—	—
Applies where the exposure limit in chapter 296-840 WAC is not in effect.					
Silica, crystalline quartz	—	—	—	—	—
Respirable fraction	14808-60-7	0.1 mg/m ³	0.3 mg/m ³	—	—
Applies where the exposure limit in chapter 296-840 WAC is not in effect.					
Silica, crystalline tripoli (as quartz)	—	—	—	—	—
Respirable fraction	1317-95-9	0.1 mg/m ³	0.3 mg/m ³	—	—
Silica, crystalline tridymite	—	—	—	—	—
Respirable fraction	15468-32-3	0.05 mg/m ³	0.15 mg/m ³	—	—
Applies where the exposure limit in chapter 296-840 WAC is not in effect.					
Silica, fused	—	—	—	—	—
Respirable fraction	60676-86-0	0.1 mg/m ³	0.3 mg/m ³	—	—
Silicates (less than 1% crystalline silica)	—	—	—	—	—
Mica	—	—	—	—	—
Respirable fraction	12001-26-2	3 mg/m ³	6 mg/m ³	—	—
Soapstone	—	—	—	—	—
Total particulate	—	6 mg/m ³	12 mg/m ³	—	—
Respirable fraction	—	3 mg/m ³	6 mg/m ³	—	—
Talc (containing asbestos)	—	—	—	—	—
Talc (containing no asbestos)	—	—	—	—	—
Respirable fraction	14807-96-6	2 mg/m ³	4 mg/m ³	—	—
Tremolite	—	—	—	—	—
Silicon	7440-21-3	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Silicon carbide	409-21-2	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
Silicon tetrahydride (Silane)	7803-62-5	5 ppm	10 ppm	—	—
Silver, metal dust and soluble compounds (as Ag)	7440-22-4	0.01 mg/m ³	0.03 mg/m ³	—	—
Soapstone	—	—	—	—	—
Total particulate	—	6 mg/m ³	12 mg/m ³	—	—
Respirable fraction	—	3 mg/m ³	6 mg/m ³	—	—
Sodium azide (as HN ₃ or NaN ₃)	26628-22-8	—	—	0.1 ppm	X
Sodium bisulfite	7631-90-5	5 mg/m ³	10 mg/m ³	—	—
Sodium-2, 4-dichloro-phenoxyethyl sulfate (Crag herbicide)	136-78-7	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Sodium fluoroacetate	62-74-8	0.05 mg/m ³	0.15 mg/m ³	—	X
Sodium hydroxide	1310-73-2	—	—	2 mg/m ³	—
Sodium metabisulfite	7681-57-4	5 mg/m ³	10 mg/m ³	—	—
Starch	9005-25-8	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Stibine	7803-52-3	0.1 ppm	0.3 ppm	—	—
Stoddard solvent	8052-41-3	100 ppm	150 ppm	—	—
Strychnine	57-24-9	0.15 mg/m ³	0.45 mg/m ³	—	—
Styrene (Phenylethylene, Vinyl benzene)	100-42-5	50 ppm	100 ppm	—	—
Subtilisins	9014-01-1	—	0.00006 mg/m ³ (60 min.)	—	—
Sucrose	57-50-1	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Sulfotep (TEDP)	3689-24-5	0.2 mg/m ³	0.6 mg/m ³	—	X
Sulfur dioxide	7446-09-5	2 ppm	5 ppm	—	—
Sulfur hexafluoride	2551-62-4	1,000 ppm	1,250 ppm	—	—
Sulfuric acid	7664-93-9	1 mg/m ³	3 mg/m ³	—	—
Sulfur monochloride	10025-67-9	—	—	1 ppm	—
Sulfur pentafluoride	5714-22-1	—	—	0.01 ppm	—
Sulfur tetrafluoride	7783-60-0	—	—	0.1 ppm	—
Sulfuryl fluoride	2699-79-8	5 ppm	10 ppm	—	—
Sulprofos	35400-43-2	1 mg/m ³	3 mg/m ³	—	—
Systox (Demeton)	8065-48-3	0.01 ppm	0.03 ppm	—	X
2, 4, 5-T	93-76-5	10 mg/m ³	20 mg/m ³	—	—
Talc (containing asbestos)	—	—	—	—	—
Talc (containing no asbestos)	—	—	—	—	—
Respirable fraction	14807-96-6	2 mg/m ³	4 mg/m ³	—	—
Tantalum	—	—	—	—	—
Metal and oxide dusts	7440-25-7	5 mg/m ³	10 mg/m ³	—	—
TDI (Toluene-2, 4-diisocyanate)	584-84-9	0.005 ppm	0.02 ppm	—	—
TEDP (Sulfotep)	3689-24-5	0.2 mg/m ³	0.6 mg/m ³	—	X
Tellurium and compounds (as Te)	13494-80-9	0.1 mg/m ³	0.3 mg/m ³	—	—
Tellurium hexafluoride (as Te)	7783-80-4	0.02 ppm	0.06 ppm	—	—
Temphos (Abate)	3383-96-8	—	—	—	—

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
TEPP	107-49-3	0.004 ppm	0.012 ppm	—	X
Terphenyls	26140-60-3	—	—	0.5 ppm	—
1, 1, 1, 2-Tetrachloro-2, 2-difluoroethane	76-11-0	500 ppm	625 ppm	—	—
1, 1, 2, 2-Tetrachloro-1, 2-difluoroethane	76-12-0	500 ppm	625 ppm	—	—
1, 1, 2, 2-Tetrachloroethane	79-34-5	1 ppm	3 ppm	—	X
Tetrachloroethylene (Perchloroethylene)	127-18-4	25 ppm	38 ppm	—	—
Tetrachloromethane (Carbon tetrachloride)	56-23-5	2 ppm	4 ppm	—	X
Tetrachloronaphthalene	1335-88-2	2 mg/m ³	4 mg/m ³	—	X
Tetraethyl lead (as Pb)	78-00-2	0.075 mg/m ³	0.225 mg/m ³	—	X
Tetrahydrofuran	109-99-9	200 ppm	250 ppm	—	—
Tetramethyl lead (as Pb)	75-74-1	0.075 mg/m ³	0.225 mg/m ³	—	X
Tetramethyl succinonitrile	3333-52-6	0.5 ppm	1.5 ppm	—	X
Tetranitromethane	509-14-8	1 ppm	3 ppm	—	—
Tetrasodium pyrophosphate	7722-88-5	5 mg/m ³	10 mg/m ³	—	—
Tetryl (2, 4, 6-trinitrophenyl-methylnitramine)	479-45-8	1.5 mg/m ³	3 mg/m ³	—	X
Thallium (soluble compounds) (as Tl)	7440-28-0	0.1 mg/m ³	0.3 mg/m ³	—	X
4, 4-Thiobis (6-tert-butyl-m-cresol)	96-69-5	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Thiodan (Endosulfan)	115-29-7	0.1 mg/m ³	0.3 mg/m ³	—	X
Thioglycolic acid	68-11-1	1 ppm	3 ppm	—	X
Thionyl chloride	7719-09-7	—	—	1 ppm	—
Thiram	137-26-8	5 mg/m ³	10 mg/m ³	—	—
Tin (as Sn)	—	—	—	—	—
Inorganic compounds	7440-31-5	2 mg/m ³	4 mg/m ³	—	—
Tin (as Sn)	—	—	—	—	—
Organic compounds	7440-31-5	0.1 mg/m ³	0.3 mg/m ³	—	X
Tin oxide (as Sn)	21651-19-4	2 mg/m ³	4 mg/m ³	—	—
Titanium dioxide	13463-67-7	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
TNT (2, 4, 6-Trinitrotoluene)	118-96-7	0.5 mg/m ³	1.5 mg/m ³	—	X
Toluene	108-88-3	100 ppm	150 ppm	—	—
Toluene-2, 4-diisocyanate (TDI)	584-84-9	0.005 ppm	0.02 ppm	—	—
m-Toluidine	108-44-1	2 ppm	4 ppm	—	X
o-Toluidine	95-53-4	2 ppm	4 ppm	—	X
p-Toluidine	106-49-0	2.0 ppm	4 ppm	—	X
Toxaphene (Chlorinated camphene)	8001-35-2	0.5 mg/m ³	1 mg/m ³	—	X
Tremolite	—	—	—	—	—
Tributyl phosphate	126-73-8	0.2 ppm	0.6 ppm	—	—
Trichloroacetic acid	76-03-9	1 ppm	3 ppm	—	—
1, 2, 4-Trichlorobenzene	120-82-1	—	—	5 ppm	—
1, 1, 1-Trichloroethane (Methyl chloroform)	71-55-6	350 ppm	450 ppm	—	—
1, 1, 2-Trichloroethane	79-00-5	10 ppm	20 ppm	—	—
Trichloroethylene	79-01-6	50 ppm	200 ppm	—	—
Trichlorofluoromethane (Fluorotrichloromethane)	75-69-4	—	—	1,000 ppm	—
Trichloromethane (Chloroform)	67-66-3	2 ppm	4 ppm	—	—

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
Trichloronaphthalene	1321-65-9	5 mg/m ³	10 mg/m ³	—	X
1, 2, 3-Trichloropropane	96-18-4	10 ppm	20 ppm	—	X
1, 1, 2-Trichloro-1, 2, 2-trifluoroethane	76-13-1	1,000 ppm	1,250 ppm	—	—
Tricyclohexyltin hydroxide (Cyhexatin)	13121-70-5	5 mg/m ³	10 mg/m ³	—	—
Triethylamine	121-44-8	10 ppm	15 ppm	—	—
Trifluorobromomethane	75-63-8	1,000 ppm	1,250 ppm	—	—
Trimellitic anhydride	552-30-7	0.005 ppm	0.015 ppm	—	—
Trimethylamine	75-50-3	10 ppm	15 ppm	—	—
Trimethyl benzene	25551-13-7	25 ppm	38 ppm	—	—
Trimethyl phosphite	121-45-9	2 ppm	4 ppm	—	—
2, 4, 6-Trinitrophenol (Picric acid)	88-89-1	0.1 mg/m ³	0.3 mg/m ³	—	X
2, 4, 6-Trinitrophenyl-methylnitramine (Tetryl)	479-45-8	1.5 mg/m ³	3 mg/m ³	—	X
2, 4, 6-Trinitrotoluene (TNT)	118-96-7	0.5 mg/m ³	1.5 mg/m ³	—	X
Triorthocresyl phosphate	78-30-8	0.1 mg/m ³	0.3 mg/m ³	—	X
Triphenyl amine	603-34-9	5 mg/m ³	10 mg/m ³	—	—
Triphenyl phosphate	115-86-6	3 mg/m ³	6 mg/m ³	—	—
Tungsten (as W)	7440-33-7	—	—	—	—
Soluble compounds	—	1 mg/m ³	3 mg/m ³	—	—
Insoluble compounds	—	5 mg/m ³	10 mg/m ³	—	—
Turpentine	8006-64-2	100 ppm	150 ppm	—	—
Uranium (as U)	7440-61-1	—	—	—	—
Soluble compounds	—	0.05 mg/m ³	0.15 mg/m ³	—	—
Insoluble compounds	—	0.2 mg/m ³	0.6 mg/m ³	—	—
n-Valeraldehyde	110-62-3	50 ppm	75 ppm	—	—
Vanadium (as V2O5)	—	—	—	—	—
Respirable fraction	1314-62-1	0.05 mg/m ³	0.15 mg/m ³	—	—
Vegetable oil mist	—	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Vinyl acetate	108-05-1	10 ppm	20 ppm	—	—
Vinyl benzene (Styrene)	100-42-5	50 ppm	100 ppm	—	—
Vinyl bromide	593-60-2	5 ppm	10 ppm	—	—
Vinyl chloride (Chloroethylene)	75-01-4	1 ppm	5 ppm	—	—
Vinyl cyanide (Acrylonitrile)	107-13-1	2 ppm	10 ppm	—	—
Vinyl cyclohexene dioxide	106-87-6	10 ppm	20 ppm	—	X
Vinyl toluene	25013-15-4	50 ppm	75 ppm	—	—
Vinylidene chloride (1, 1-Dichloroethylene)	75-35-4	1 ppm	3 ppm	—	—
VM & P Naphtha	8032-32-4	300 ppm	400 ppm	—	—
Warfarin	81-81-2	0.1 mg/m ³	0.3 mg/m ³	—	—
Welding fumes (total particulate)	—	5 mg/m ³	10 mg/m ³	—	—
Wood dust	—	—	—	—	—
Nonallergenic; (All woods except allergenic)	—	5 mg/m ³	10 mg/m ³	—	—
Allergenic (e.g. cedar, mahogany and teak)	—	2.5 mg/m ³	5 mg/m ³	—	—
Xylenes (ortho, meta, and para isomers) (Dimethylbenzene)	1330-20-7	100 ppm	150 ppm	—	—
m-Xylene alpha, alpha-diamine	1477-55-0	—	—	0.1 mg/m ³	X

Substance	CAS	TWA ₈	STEL	Ceiling	Skin
Xylidine (Dimethylaminobenzene)	1300-73-8	2 ppm	4 ppm	—	X
Yttrium	7440-65-5	1 mg/m ³	3 mg/m ³	—	—
Zinc chloride fume	7646-85-7	1 mg/m ³	2 mg/m ³	—	—
Zinc chromate (as CrO ₃)	Varies with compound	0.05 mg/m ³	—	0.1 mg/m ³	—
Zinc oxide	1314-13-2	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Zinc oxide fume	1314-13-2	5 mg/g ³	10 mg/m ³	—	—
Zinc stearate	557-05-1	—	—	—	—
Total particulate	—	10 mg/m ³	20 mg/m ³	—	—
Respirable fraction	—	5 mg/m ³	10 mg/m ³	—	—
Zirconium compounds (as Zr)	7440-67-2	5 mg/m ³	10 mg/m ³	—	—

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-628 Definitions.

Ceiling ((-)). An exposure limit, measured over the shortest time period feasible, that must not be exceeded during any part of the employee's workday.

Dust ((-)). Solid particles suspended in air. Dusts are generated by handling, drilling, crushing, grinding, rapid impact, detonation, or decrepitation of organic or inorganic materials such as rock, ore, metal, coal, wood, grain, etc.

Exposed or exposure ((-)). The contact an employee has with a toxic substance, harmful physical agent or oxygen deficient condition. Exposure can occur through various routes of entry, such as inhalation, ingestion, skin contact, or skin absorption.

Fume ((-)). Solid particles suspended in air, generated by condensation from the gaseous state, generally after volatilization from molten metals, etc.

Gas ((-)). A normally formless fluid which can be changed to the liquid or solid state by the effect of increased pressure or decreased temperature or both.

Mist ((-)). Liquid droplets suspended in air, generated by condensation from the gaseous to the liquid state or by breaking up a liquid into a dispersed state, such as by splashing, foaming, spraying or atomizing.

Oxygen deficient ((-)). An atmosphere with an oxygen content below 19.5% by volume.

Permissible exposure limits (PEL) ((-)). Permissible exposure limits (PELs) are employee exposures to toxic substances or harmful agents that must not be exceeded. PELs are specified in applicable WISHA rules.

Short-term exposure limit (STEL) ((-)). An exposure limit averaged over a short time period (usually measured for 15 minutes) that must not be exceeded during any part of an employee's workday.

Time weighted average (TWA₈) ((-)). An exposure limit averaged over 8 hours that must not be exceeded during an employee's workday.

Toxic substance ((-)). Any chemical substance or biological agent, such as bacteria, virus, and fungus, which is any of the following:

((*) (a) Listed in the latest edition of the National Institute for Occupational Safety and Health (NIOSH) Registry of Toxic Effects of Chemical Substances (RTECS);

((*) (b) Shows positive evidence of an acute or chronic health hazard in testing conducted by, or known to, the employer.

The subject of a material safety data sheet kept by or known to the employer showing the material may pose a hazard to human health.

Vapor ((-)). The gaseous form of a substance that is normally in the solid or liquid state.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-630 Scope. The purpose of this part is to:

((*) (1) Prevent employee hearing loss by minimizing employee noise exposures;

AND

((*) (2) Make sure employees exposed to noise are protected.

These goals are accomplished by:

((*) (a) Measuring and computing the employee noise exposure from all equipment and machinery in the workplace, as well as any other noise sources in the work area;

((*) (b) Protecting employees from noise exposure by using feasible noise controls;

((*) (c) Making sure employees use hearing protection, if ((you)) ~~the employer~~ cannot feasibly control the noise;

((*) (d) Training employees about hearing loss prevention;

((*) (e) Evaluating ((your)) ~~the employer's~~ hearing loss prevention efforts by tracking employee hearing or periodically reviewing controls and protection;

((*) (f) Making appropriate corrections to ((your)) ~~the employer's~~ program.

Reference: Table 1 will help ((you)) ~~the employer~~ determine the hearing loss prevention requirements for ((your)) ~~the~~ workplace. For the specific requirements associated with Noise Evaluation Criteria, see WAC 296-307-63410 of this part.

**Table 1
Noise Evaluation Criteria**

Criteria	Description	Requirements
85 dBA TWA ₈	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must have a hearing loss prevention program	- Hearing protection - Training - Audiometric testing
90 dBA TWA ₈	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must reduce employee noise exposures in the workplace	- Noise controls AND - Hearing protection - Training - Audiometric testing
115 dBA measured using slow response	Extreme noise level (greater than one second in duration)	- Hearing protection - Signs posted in work areas warning of exposure
140 dBC measured using fast response	Extreme impulse or impact noise (less than one second in duration)	Hearing protection

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-632 Summary.

~~((You*))~~ Employer responsibility:

To prevent employee hearing loss by minimizing, and providing protection from, noise exposures.

~~((You must:~~

~~Conduct employee noise exposure monitoring~~

~~WAC 296-307-63205~~

~~Control employee noise exposures that equal or exceed 90 dBA TWA₈~~

~~WAC 296-307-63210~~

~~Make sure employees use hearing protection when their noise exposure equals or exceed 85 dBA TWA₈~~

~~WAC 296-307-63215~~

~~Make sure exposed employees receive training about noise and hearing protection~~

~~WAC 296-307-63220~~

~~Make sure warning signs are posted for areas with noise levels that equal or exceed 115 dBA~~

~~WAC 296-307-63225~~

~~Arrange for oversight of audiometric testing~~

~~WAC 296-307-63230~~

Identify and correct deficiencies in your hearing loss prevention program

WAC 296-307-63235

Document your hearing loss prevention activities

WAC 296-307-63240.))

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Conduct employee noise exposure monitoring.</u>	<u>WAC 296-307-63205</u>
<u>Control employee noise exposures that equal or exceed 90 dBA TWA₈.</u>	<u>WAC 296-307-63210</u>
<u>Make sure employees use hearing protection when their noise exposure equals or exceed 85 dBA TWA₈.</u>	<u>WAC 296-307-63215</u>
<u>Make sure exposed employees receive training about noise and hearing protection.</u>	<u>WAC 296-307-63220</u>
<u>Make sure warning signs are posted for areas with noise levels that equal or exceed 115 dBA.</u>	<u>WAC 296-307-63225</u>
<u>Arrange for oversight of audiometric testing.</u>	<u>WAC 296-307-63230</u>
<u>Identification and correction of deficiencies in a hearing loss prevention program.</u>	<u>WAC 296-307-63235</u>
<u>Documenting hearing loss prevention activities.</u>	<u>WAC 296-307-63240</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63205 Conduct employee noise exposure monitoring.

~~((You must:~~

•)) (1) The employer must conduct employee noise exposure monitoring to determine the employee's actual exposure when reasonable information indicates that any employee's exposure may equal or exceed 85 dBA TWA₈.

Notes:

(*) 1. Representative monitoring may be used where several employees perform the same tasks in substantially similar conditions;

(*) 2. Examples of information or situations that can indicate exposures which equal or exceed 85 dBA TWA₈, include:

(-) a. Noise in the workplace that interferes with people speaking, even at close range;

(-) b. Information from the manufacturer of equipment (~~(you use))~~ the employer uses in the workplace that indicates high noise levels for machines in use;

(-) c. Reports from employees of ringing in their ears or temporary hearing loss;

- (-) d. Warning signals or alarms that are difficult to hear;
- (-) e. Work near abrasive blasting or jack hammering operations;
- (-) f. Use of tools and equipment such as the following:
 - (■) i. Heavy equipment or machinery;
 - (■) ii. Fuel-powered hand tools;
 - (■) iii. Compressed air-driven tools or equipment in frequent use;
 - (■) iv. Power saws, grinders or chippers;
 - (■) v. Powder-actuated tools.

~~(You must:~~

*) **(2) The employer must follow applicable guidance in WAC 296-307-634 when conducting noise exposure monitoring.**

(*) (3) The employer must make sure ~~(you)~~ the sampling for noise exposure monitoring identifies:

(-) **(a)** All employees whose exposure equals or exceeds the following:

(■) **(i)** 85 dBA TWA₈ (noise dosimetry, providing an average exposure over an eight-hour time period);

(■) **(ii)** 115 dBA (slow response sound level meter, identifying short-term noise exposures);

(■) **(iii)** 140 dBC (fast response sound level meter, identifying almost instantaneous noise exposures).

(-) **(b)** Exposure levels for selection of hearing protection.

(*) (4) The employer must provide exposed employees and their representatives with an opportunity to observe any measurements of employee noise exposure that are conducted.

(*) (5) The employer must notify each employee whose exposure equals or exceeds 85 dBA TWA₈ of the monitoring results within five working days of when ~~(you)~~ the employer receives the results.

(*) (6) The employer must conduct additional noise monitoring whenever a change in production, process, equipment or controls, may reasonably be expected to result in:

(-) **(a)** Additional employees whose exposure equals or exceeds 85 dBA TWA₈;

(-) **(b)** Employees exposed to higher level of noise requiring more effective hearing protection.

Note: Conditions that may be expected to increase exposure include:

- (*) **1.** Adding machinery to the work area;
- (*) **2.** Increasing production rates;
- (*) **3.** Removal or deterioration of noise control devices;
- (*) **4.** Increased use of noisy equipment;
- (*) **5.** Change in work schedule;
- (*) **6.** Change of job duties.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63210 Control employee noise exposures that equal or exceed 90 dBA TWA₈.

IMPORTANT:

Hearing protection provides a barrier to noise and protects employees but is not considered a control of the noise

hazard. Separate requirements apply to hearing protection and are found in WAC 296-307-63215.

~~(You must:~~

*) **The employer must reduce employee noise exposure, using feasible controls, wherever exposure equals or exceeds 90 dBA TWA₈.**

Notes:

- (*) **1.** Once noise exposures are brought below 90 dBA TWA₈, no further reduction is required. However, further reduction of noise may reduce the need for other hearing loss prevention requirements.
- (*) **2.** Controls that eliminate noise at the source or establish a permanent barrier to noise are typically more reliable. For example:
 - (-) **a.** Replacing noisy equipment with quiet equipment;
 - (-) **b.** Using silencers and mufflers;
 - (-) **c.** Installing enclosures;
 - (-) **d.** Damping noisy equipment and parts.
- (*) **3.** Other controls and work practices may also be useful for reducing noise exposures. Examples include:
 - (-) **a.** Employee rotation;
 - (-) **b.** Limiting use of noisy equipment;
 - (-) **c.** Rescheduling work.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63215 Make sure employees use hearing protection when their noise exposure equals or exceeds 85 dBA TWA₈.

~~(You must:~~

*) **(1) the employer must make sure employees wear hearing protectors that will provide sufficient protection when exposure equals or exceeds:**

(-) **(a)** 85 dBA TWA₈ (noise dosimetry, providing an average exposure over an eight-hour time period);

(-) **(b)** 115 dBA (slow response sound level meter, identifying short-term noise exposures);

(-) **(c)** 140 dBC (fast response sound level meter, identifying almost instantaneous noise exposures).

(*) (2) The employer must provide employees with an appropriate selection of hearing protectors:

(-) **(a)** The selection must include at least two distinct types (such as molded earplugs, foam earplugs, custom-molded earplugs, earcaps, or earmuffs) for each exposed employee and must be sufficient to cover:

(■) **(i)** Different levels of hearing protection needed in order to reduce all employee exposures to a level below 85 dBA TWA₈;

(■) **(ii)** Different sizes;

(■) **(iii)** Different working conditions.

(-) **(b)** Consider requests of the employees regarding:

(■) **(i)** Physical comfort;

(■) **(ii)** Environmental conditions;

(■) **(iii)** Medical needs;

(■) **(iv)** Communication requirements.

Note:

Hearing protector selection should include earplugs, earcaps and earmuffs.

~~(You must:~~

*) (3) The employer must provide hearing protection at no cost to employees;

((*) (4) The employer must supervise employees to make sure that hearing protection is used correctly;

((*) (5) The employer must make sure hearing protectors are:

((-) (a) Properly chosen for fit;

((-) (b) Replaced as necessary.

((*) (6) The employer must make sure all hearing protection is sufficient to reduce the employee's equivalent eight-hour noise exposure to 85 dBA or less. When using the A-weighted exposure measurements, reported as "dBA TWA₈," the reduction in noise exposure by hearing protectors is given by Table 2(†).

Table 2
Effective Protection of Hearing Protectors

Type of hearing protection	Effective protection
Single hearing protection (earplugs, earcaps or earmuffs)	7 dB less than the manufacturer assigned noise reduction rating (NRR); for example, earplugs with an NRR of 20 dB are considered to reduce employee exposures of 95 dBA TWA ₈ to 82 dBA TWA ₈
Dual hearing protection (earplug and earmuff worn together)	2 dB less than the higher NRR of the two protectors; for example, earplugs with an NRR of 20 dB and earmuffs with an NRR of 12 dB are considered to reduce employee exposures of 100 dBA TWA ₈ to 82 dBA TWA ₈

((*) (7) In addition to protection based on daily noise dose, the employer must make sure hearing protection has an NRR of at least 20 dB when exposures involve noise that equals or exceeds 115 dBA (slow response sound level meter) or 140 dBC (fast response sound level meter).

Note: ((†)) The employer may also evaluate hearing protection by using the other methods given in the NIOSH *Compendium of Hearing Protection* (DHHS (NIOSH) Publication No. 95-105 or online at <http://www.cdc.gov/niosh/topics/noise/hpcomp.html>. These methods require additional monitoring and are more complex, but provide a more thorough evaluation of protection. This may be useful in cases where communication is critical or for evaluating hearing protection for employees with hearing impairment.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63220 Make sure exposed employees receive training about noise and hearing protection.

~~((You must:~~

*) (1) The employer must train all employees whose noise exposure equals or exceeds 85 dBA TWA₈.

((*) (2) The employer must provide training when an employee is first assigned to a position involving noise exposure that equals or exceeds 85 dBA TWA₈ and at least annually after that.

((*) (3) The employer must update information provided in the training program to be consistent with changes in controls, hearing protectors and work processes.

((*) (4) The employer must make sure ((you)) noise and hearing protection training includes:

((-) (a) The effects of noise on hearing (including both occupational and nonoccupational exposures);

((-) (b) Noise controls used in ((you)) workplace;

((-) (c) The purpose of hearing protectors: The advantages, disadvantages, and attenuation of various types;

((-) (d) Instructions about selecting, fitting, using, and caring for hearing protection;

((-) (e) The purpose and procedures for program evaluation including audiometric testing and hearing protection auditing when ((you)) the employer chooses to rely upon auditing (see WAC 296-307-638);

((-) (f) The employees' right to access records kept by the employer.

((*) (5) The employer must maintain a written program describing initial and refresher training.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63225 Make sure warning signs are posted for areas where noise levels equal or exceed 115 dBA.

~~((You must:~~

*) The employer must make sure warning signs are posted at the entrances or boundaries of all well-defined work areas where employees may be exposed to noise that equals or exceeds 115 dBA (measured using a sound level meter with slow response).

((-) Warning signs must clearly indicate that the area is a high noise area and that hearing protectors are required.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63230 Arrange for oversight of audiometric testing.

~~((You must:~~

*) (1) The employer must make sure audiometric testing as described by WAC 296-307-636 is supervised and reviewed by one of the following licensed or certified individuals:

((-) (a) An audiologist;

((-) (b) An otolaryngologist;

((-) (c) Another qualified physician.

((*) (2) The employer must make sure audiograms are conducted by one of the above individuals or by a technician certified by the Council of Accreditation in Occupational

Hearing Conservation (CAOHC) and responsible to a qualified reviewer.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63235 ~~((Identify and correct))~~ Identification and correction of deficiencies in ((your)) a hearing loss prevention program.

~~((You must:~~

~~*)~~ (1) The employer must use audiometric testing to identify hearing loss, which may indicate program deficiencies;

~~(*)~~ (2) The employer must take appropriate actions when deficiencies are found with ((your)) the employer's program.

~~((-~~) A deficiency may be indicated when:

~~(*)~~ (a) Any employee experiences measurable hearing loss indicated by a standard threshold shift;

OR

~~(*)~~ (b) Any employee isn't wearing appropriate hearing protection during an audit when auditing is used in place of baseline audiograms for short term employees (see WAC 296-307-638, Option to audiometric testing).

Note: A standard threshold shift or audit deficiency does not necessarily indicate that a significant hearing loss has occurred. These criteria are intended to help identify where there may be flaws in ((your)) the employer's hearing loss prevention program that can be fixed before permanent hearing loss occurs. There are additional statistical tools and tests that may be used to improve the effectiveness of ((your)) the employer's program. Staff conducting audiometric testing and auditing may be able to suggest additional ways to improve ((your)) the employer's hearing loss prevention program and tailor it to ((your)) the worksite.

~~((You must:~~

~~*)~~ (3) The employer must evaluate the following, at a minimum, when responding to a standard threshold shift:

~~((-~~) (a) Employee noise exposure measurements;

~~((-~~) (b) Noise controls in the work area;

~~((-~~) (c) The selection of hearing protection available and refit employees as necessary;

~~((-~~) (d) Employee training on noise and the use of hearing protection and conduct additional training as necessary.

Reference: ~~((You))~~ The employer may use the option of auditing hearing protection (see WAC 296-307-638) for employees hired or transferred to jobs with noise exposure for less than one year. ((You)) The employer may also use audiograms provided by a third-party hearing loss prevention program in some circumstances. Details of these program options are found in WAC 296-307-638, Options to audiometric testing.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63240 ~~((Document your))~~ Documenting hearing loss prevention activities.

~~((You must:~~

~~*)~~ The employer must create and retain records documenting noise exposures. Include, at a minimum:

~~((-~~) (1) Exposure measurements required by this part for at least two years and for as long as ((you rely)) the employer relies upon them to determine employee exposure;

~~((-~~) (2) Audiometric test records for the duration of employment for the affected employees;

~~((-~~) (3) Hearing protection audits, if ((you)) the employer chooses to rely upon them, for the duration of employment of the affected employees.

Notes: ~~((You need))~~ 1. The employer needs to keep as complete a record as possible. Records developed under previous rules or in other jurisdictions need to be kept, even when they do not fulfill the full requirements of this part. Similarly, records found to have errors in collection or processing need to be kept if they provide an indication of employee exposure or medical condition not found in other records.
~~((You))~~ 2. The employer may want to consider ((your)) other business needs, such as worker's compensation claims management, before discarding these records.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-634 Summary.

~~((Your))~~ Employer responsibility:

Conduct noise monitoring or measurement to evaluate employee exposures in ((your)) the workplace.

~~((You must:~~

~~Make sure that noise measuring equipment meets recognized standards~~

~~WAC 296-307-63405~~

~~Measure employee noise exposure~~

~~WAC 296-307-63410~~

~~Use these equations when estimating full-day noise exposure from sound level measurements~~

~~WAC 296-307-63415.))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Make sure that noise-measuring equipment meets recognized standards.</u>	<u>WAC 296-307-63405</u>
<u>Measure employee noise exposure.</u>	<u>WAC 296-307-63410</u>
<u>Use these equations when estimating full-day noise exposure from sound level measurements.</u>	<u>WAC 296-307-63415</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63405 Make sure that noise-measuring equipment meets recognized standards.

~~((You must:~~

~~*)~~ (1) The employer must make sure that noise dosimetry equipment meets these specifications:

~~((-~~) Dosimeters must be equipment class 2AS-90/80-5 of the American National Rule Specification for Personal

Noise Dosimeters, ANSI S1.25-1991, such dosimeters are normally marked "Type 2."

Note: Make sure any dosimeter (~~you use~~) used is Type 2 equipment that:

- (*) 1. Uses slow integration and A-weighting of sound levels.
- (*) 2. Has the **criterion level** set to 90 dB, so the dosimeter will report a constant 8-hour exposure at 90 dBA as a 100% dose.
- (*) 3. Has the **threshold level** set at 80 dB, so the dosimeter will register all noise above 80 dB.
- (*) 4. Uses a 5 dB **exchange rate** for averaging of noise levels over the sample period.

~~(You must:~~

*) (2) The employer must make sure that sound level meters meet these specifications:

((-) (a) American National Standard Specification for Sound Level Meters, S1.4-1984, Type 2 requirements for sound level meters, such sound level meters are normally marked "Type 2."

((■) (b) For continuous noise measurements, the meter must be capable of measuring A-weighted sound levels with slow response.

((■) (c) For impulse or impact noise measurements, the meter must be capable of indicating maximum C-weighted sound level measurements with fast response.

(*) (3) The employer must calibrate dosimeters and sound level meters used to monitor employee noise exposure:

((-) (a) Before and after each day's use;

AND

((-) (b) Following the instrument manufacturer's calibration instructions.

Notes: (~~you~~) 1. The employer may conduct dosimetry using an exchange rate less than 5 dB and compare the results directly to the noise evaluation criteria in Table 1.

(*) 2. For measuring impulse and impact noise (~~you~~) the employer may also use a sound level meter set to measure maximum impulse C-weighted sound levels or peak C-weighted sound levels.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63410 Measure employee noise exposure.

IMPORTANT:

A noise dosimeter is the basis for determining total daily noise exposure for employees. However, where (~~you have~~) there is constant noise levels, (~~you~~) the employer may estimate employee noise exposure using measurements from a sound level meter. Calculation of the employee noise exposure must be consistent with WAC 296-307-63415.

~~(You must:~~

*) (1) The employer must include all:

((-) (a) Workplace noise from equipment and machinery in use;

((-) (b) Other noise from sources necessary to perform the work;

((-) (c) Noise outside the control of the exposed employees.

(*) (2) The employer must use a noise dosimeter when necessary to measure employee noise dose.

(*) (3) The employer must use a sound level meter to evaluate continuous and impulse noise levels.

(*) (4) The employer must identify all employees whose exposures equal or exceed the Noise Evaluation Criteria as follows:

Noise Evaluation Criteria

Criteria	Description	Requirements
85 dBA TWA ₈	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must have a hearing loss prevention program	- Hearing protection - Training - Audiometric testing
90 dBA TWA ₈	Full-day employee noise exposure dose. If you have one or more employees whose exposure equals or exceeds this level, you must reduce employee noise exposures in the workplace	Noise controls (in addition to the requirements for 85 dBA TWA ₈)
115 dBA measured using slow response	Extreme noise level (greater than one second in duration)	- Hearing protection - Signs posted in work areas warning of exposure
140 dBC measured using fast response	Extreme impulse or impact noise (less than one second in duration)	Hearing protection

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63415 Use these equations when estimating full-day noise exposure from sound level measurements.

~~(You must:~~

*) The employer must compute employee's full-day noise exposure by using the appropriate equations from Table 3 "Noise Dose Computation" when using a sound level meter to estimate noise dose.

**Table 3
Noise Dose Computation**

Description	Equation
Compute the noise dose based on several time periods of constant noise during the shift	The total noise dose over the work day, as a percentage, is given by the following equation where C_n indicates the total time of exposure at a specific noise level, and T_n indicates the reference duration for that level. $D = 100 * ((C_1/T_1) + (C_2/T_2) + (C_3/T_3) + \dots + (C_n/T_n))$
The reference duration is equal to the time of exposure to continuous noise at a specific sound level that will result in a one hundred percent dose	The reference duration, T, for sound level, L, is given in hours by the equation: $T = 8 / (2^{((L - 90)/5)})$
Given a noise dose as a percentage, compute the equivalent eight-hour time weighted average noise level	The equivalent eight-hour time weighted average, TWA_8 , is computed from the dose, D, by the equation: $TWA_8 = 16.61 * \text{Log}_{10}(D/100) + 90$

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-636 Summary.

~~((You must))~~ **Employer responsibility:**

To conduct audiometric testing of employees exposed to noise to make sure that their hearing protection is effective.

~~((You must:~~

~~Provide audiometric testing at no cost to employees~~

~~WAC 296-307-63605~~

~~Establish a baseline audiogram for each exposed employee~~

~~WAC 296-307-63610~~

~~Conduct annual audiograms~~

~~WAC 296-307-63615~~

~~Review audiograms that indicate a standard threshold shift~~

~~WAC 296-307-63620~~

~~Keep the baseline audiogram without revision, unless annual audiograms indicate a persistent threshold shift or a significant improvement in hearing~~

~~WAC 296-307-63625~~

~~Make sure a record is kept of audiometric tests~~

~~WAC 296-307-63630~~

~~Make sure audiometric testing equipment meets these requirements~~

~~WAC 296-307-63635.))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Provide audiometric testing at no cost to employees.</u>	<u>WAC 296-307-63605</u>
<u>Establish a baseline audiogram for each exposed employee.</u>	<u>WAC 296-307-63610</u>
<u>Conduct annual audiograms.</u>	<u>WAC 296-307-63615</u>
<u>Review audiograms that indicate a standard threshold shift.</u>	<u>WAC 296-307-63620</u>
<u>Keep the baseline audiogram without revision, unless annual audiograms indicate a persistent threshold shift or a significant improvement in hearing.</u>	<u>WAC 296-307-63625</u>
<u>Make sure a record is kept of audiometric tests.</u>	<u>WAC 296-307-63630</u>
<u>Make sure audiometric testing equipment meets these requirements.</u>	<u>WAC 296-307-63635</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63605 Provide audiometric testing at no cost to employees.

~~((You must:~~

~~*) The employer must provide audiograms, including any required travel or necessary additional examinations or testing, at no cost to exposed employees.~~

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63610 Establish a baseline audiogram for each exposed employee.

~~((You must:~~

~~*) (1) The employer must conduct a baseline audiogram when an employee is first assigned to work involving noise exposures that equal or exceed 85 dBA TWA_8 .~~

~~((-) (a) Make sure this audiogram is completed no more than one hundred eighty days after the employee is first assigned;~~

~~OR~~

~~((-) (b) Make sure employee is covered by a hearing protection audit program (as described by WAC 296-307-638 and available as an alternative only for employees hired for less than one year).~~

Note: Employers who utilize mobile test units are allowed up to one year to obtain a valid baseline audiogram for each exposed employee. The employees must still be given training and hearing protection as required by this part.

~~((You must:~~

*) (2) The employer must make sure employees are not exposed to workplace noise at least fourteen hours before testing to establish a baseline audiogram.

((-) Hearing protectors may be used to accomplish this.

((*) (3) The employer must notify employees of the need to avoid high levels of nonoccupational noise exposure (such as loud music, headphones, guns, power tools, motorcycles, etc.) during the fourteen-hour period immediately preceding the baseline audiometric examination.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63615 Conduct annual audiograms.

~~((You must:~~

*) (1) The employer must conduct annual audiograms for employees as long as they continue to be exposed to noise that equals or exceeds 85 dBA TWA₈.

Note: Annual audiometric testing may be conducted at any time during the work shift. By conducting the annual audiogram during the work shift with the employee exposed to typical noise for their job, the test may record a temporary threshold shift. This makes the test more sensitive to potential hearing loss and may help you improve employee protection before a permanent threshold shift occurs. A suspected temporary shift is one reason an employer may choose to retest employee hearing.

~~((You must:~~

*) (2) The employer must make sure each employee is informed of the results of his or her audiometric test.

((-) Include whether or not there has been a hearing level decrease or improvement since their previous test.

((*) (3) The employer must make sure each employee's annual audiogram is compared to his or her baseline audiogram by an audiologist, otolaryngologist, another qualified physician, or the technician conducting the test to determine if a standard threshold shift has occurred.

((-) If the annual audiogram indicates that an employee has suffered a standard threshold shift, ~~((you))~~ the employer may obtain a retest within thirty days and consider the results of the retest as the annual audiogram.

((*) (4) The employer must make sure that an audiologist, otolaryngologist, or other qualified physician sees any annual audiogram that indicates a standard threshold shift.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63620 Review audiograms that indicate a standard threshold shift.

~~((You must:~~

*) (1) The employer must make sure the health care professional supervising audiograms has:

((-) (a) A copy of this part;

((-) (b) The baseline audiogram and most recent audiogram of the employee to be evaluated;

((-) (c) Background noise level records for the testing room;

((-) (d) Calibration records for the audiometer.

((*) (2) The employer must obtain an opinion from the health care professional supervising audiograms as to

whether the audiograms indicate possible occupational hearing loss and any recommendations for changes in hearing protection.

((*) (3) The employer must pay for any clinical audiological evaluation or otological examination required by the reviewer, if:

((-) (a) Additional review is necessary to evaluate the cause of hearing loss;

OR

((-) (b) If there is indication of a medical condition of the ear caused or aggravated by the wearing of hearing protectors.

((*) (4) The employer must inform the employee in writing of the existence of a standard threshold shift within twenty-one calendar days of the determination.

((*) (5) The employer must make arrangements for the reviewer to communicate to the employee any suspected medical conditions that are found unrelated to ~~((you))~~ the workplace. This information is confidential and must be handled appropriately.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63625 Keep the baseline audiogram without revision, unless annual audiograms indicate a persistent threshold shift or a significant improvement in hearing.

~~((You must:~~

*) The employer must keep the baseline audiogram without revision, unless a qualified reviewer determines:

((-) (1) The standard threshold shift revealed by the audiogram is persistent;

OR

((-) (2) The hearing threshold shown in the annual audiogram indicates significant improvement over the baseline audiogram.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63630 Make sure a record is kept of audiometric tests.

~~((You must:~~

*) The employer must retain a legible copy of all employee audiograms conducted under this part.

((-) Make sure the record includes:

((■) (1) Name and job classification of the employee;

((■) (2) Date of the audiogram;

((■) (3) The examiner's name;

((■) (4) Date of the last acoustic or exhaustive calibration of the audiometer;

((■) (5) Employee's most recent noise exposure assessment;

((■) (6) The background sound pressure levels in audiometric test rooms.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63635 Make sure audiometric testing equipment meets these requirements.

~~((You must~~

•)) (1) The employer must use pure tone, air conduction, hearing threshold examinations, with test frequencies including as a minimum 500, 1000, 2000, 3000, 4000, and 6000 Hz.

(-) (a) Tests at each frequency must be taken separately for each ear.

(-) (b) Supra-aural headphones must be used.

(•) (2) The employer must conduct audiometric tests with audiometers (including microprocessor audiometers) that meet the specifications of, and are maintained and used according to, American National Standard Specification for Audiometers, S3.6-1996.

(•) (3) The employer must check the functional operation of the audiometer each day before use by doing all of the following:

(-) (a) Make sure the audiometer's output is free from distorted or unwanted sound;

(-) (b) Test either a person with known, stable hearing thresholds or a bio-acoustic simulator;

(-) (c) Perform acoustic calibration for deviations of 10 dB or greater.

(•) (4) Audiometer calibration must be checked acoustically at least annually to verify continued conformance with ANSI S3.6-1996. Test frequencies below 500 Hz and above 6000 Hz may be omitted from this check.

(•) (5) The employer must perform an exhaustive calibration ~~((must be performed))~~ at least every two years according to the American National Standard Specification for Audiometers, S3.6-1996. Test frequencies below 500 Hz and above 6000 Hz may be omitted from the calibration.

(•) (6) The employer must provide audiometric test rooms that meet the requirements of ANSI S3.1-1999 American National Standard Maximum Permissible Ambient Noise Levels for Audiometric Test Rooms using the following table of Maximum Ambient Sound Pressure Levels(=);

Table 4

Maximum Ambient Sound Pressure Levels

Frequency (Hz)	500	1000	2000	4000	8000
Sound Pressure Level (dB)	40	40	47	57	62

Note: The American Industrial Hygiene Association and National Hearing Conservation Association recommend conducting audiograms using the requirements of ANSI S3.1-1999 American National Standard Maximum Permissible Ambient Noise Levels for Audiometric Test Rooms with adjustments at only 500 Hz and below.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-638 Summary.

~~((You))~~ **Employer responsibility:**

This section provides options to baseline audiometric testing for employees assigned to duties with noise exposures for **less than one year**. These program options may also be used to provide added assessment of longer-term employees in addition to audiometric testing.

The requirements of this section apply only if ~~((you))~~ the employer decides to use auditing or a third-party hearing loss prevention program and do not conduct baseline audiometric testing for those employees.

~~((Hearing Protection Audits~~

~~You must:~~

~~Conduct hearing protection audits at least quarterly~~

~~WAC 296-307-63805~~

~~Make sure staff conducting audits are properly trained~~

~~WAC 296-307-63810~~

~~Assess the hearing protection used by each employee during audits~~

~~WAC 296-307-63815~~

~~Document your hearing protection audits~~

~~WAC 296-307-63820~~

~~Third-Party Audiometric Testing~~

~~You must:~~

~~Make sure third-party hearing loss prevention programs meet the following requirements~~

~~WAC 296-307-63825))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Hearing Protection Audits</u>	
<u>Conduct hearing protection audits at least quarterly.</u>	<u>WAC 296-307-63805</u>
<u>Make sure staff conducting audits are properly trained.</u>	<u>WAC 296-307-63810</u>
<u>Assess the hearing protection used by each employee during audits.</u>	<u>WAC 296-307-63815</u>
<u>Document your hearing protection audits.</u>	<u>WAC 296-307-63820</u>
<u>Third-Party Audiometric Testing</u>	
<u>Make sure third-party hearing loss prevention programs meet the following requirements.</u>	<u>WAC 296-307-63825</u>

IMPORTANT:

Hearing protection audits are a tool for use in evaluating ~~((your))~~ the employer's hearing loss prevention program in cases where audiometric testing does not provide a useful measure. For example, if most of ~~((your))~~ the employees are hired on a temporary basis for a few months at a time, audiometric testing may not identify the small changes in hearing acuity that could occur. Auditing provides an alternative to audiometric testing in these cases.

Auditing is not required unless ~~((you))~~ the employer uses it in place of baseline audiometric testing for employees hired for a period of **less than one year** and is permitted as a substitute for audiometric testing only for these employees.

Third-party hearing loss prevention programs are full hearing loss prevention programs and are distinct from audiometric testing provided by third parties as part of ~~((your own))~~ the employer's hearing loss prevention program. These programs may be organized by labor groups, trade associations, labor-management cooperatives, or other organizations to:

((★)) (1) Cover a specific group of employees;

OR

((★)) (2) Combine efforts for several employers with common employees.

Although ~~((you))~~ the employer remains responsible for the program, third-party programs can have at least two benefits over the employer running ~~((your))~~ its own program:

((★)) (a) The audiometric testing is portable between the participating employers so new testing will not be needed when an employee changes employers.

((★)) (b) Employees who only work for short periods for any one employer can be monitored under the group program over a longer period of time increasing the effectiveness of the audiometric testing in preventing hearing loss for these employees.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63805 Conduct hearing protection audits at least quarterly.

~~((You must:~~

★)) (1) The employer must conduct audits at least quarterly to provide a representative assessment of ~~((your))~~ the workplace.

((-) (a) The assessment is representative if it:

((■)) (i) Covers all processes and work activities in ~~((your))~~ the employer's business at full production levels;

AND

((■)) (ii) Covers all employees present on the audit day.

((-) (b) If ~~((your))~~ the business is mobile or involves variable processes, auditing may need to be repeated more often than quarterly;

((-) (c) Auditing does not need to be repeated more than monthly as long as a reasonable effort is made to cover:

((■)) (i) The activities with greatest exposure;

AND

((■)) (ii) As many employees as possible.

((★)) (2) The employer must assess exposures and hearing protection for the full shift for each employee covered at the time of the audit.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63810 Make sure staff conducting audits are properly trained.

~~((You must:~~

★)) The employer must make sure staff conducting hearing protection audits:

((-) (1) Can demonstrate competence in:

((■)) (a) Evaluating hearing protection attenuation;

((■)) (b) Evaluating hearing protector choices;

((■)) (c) Assessing the correct use of hearing protectors.

((-) (2) Are certified by the Council for Accreditation in Occupational Hearing Conservation (CAOHC) or have training in the following areas:

((■)) (a) Noise and hearing loss prevention;

((■)) (b) Washington state noise regulations;

((■)) (c) Hearing protectors;

((■)) (d) Fitting of hearing protectors;

((■)) (e) Basic noise measurement;

((■)) (f) Hearing loss prevention recordkeeping.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63815 Assess the hearing protection used by each employee during audits.

~~((You must:~~

★)) The employer must confirm that:

((-) (1) Current site conditions during audits are consistent with conditions existing during noise monitoring;

((-) (2) The hearing protection used by the employee is sufficient and appropriate for the conditions;

((-) (3) The hearing protection is worn properly;

((-) (4) The employees are satisfied with the performance and comfort of the hearing protection.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63820 Document ~~((your))~~ hearing protection audits.

~~((You must:~~

★)) (1) The employer must keep a record of audit results for each employee assessed for the length of their employment and for the length of time ~~((you))~~ the employer will rely upon the audit results.

((★)) (2) The employer must include the following information in the record:

((-) (a) The make and model of the hearing protectors;

((-) (b) The size of the protectors;

((-) (c) Average noise exposure of the employee;

((-) (d) Any problems found with use of the hearing protection;

((-) (e) Any comments or complaints from the employee regarding the hearing protection.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-63825 Make sure third-party hearing loss prevention programs meet the following requirements.

IMPORTANT:

Third-party hearing loss prevention programs are intended:

((★)) 1. For short-term employees hired or assigned to duties having noise exposures **for less than one year;**

AND

((★)) 2. For seasonal employees.

However, other employees may be included as long as ~~((you))~~ the employer meets all requirements for hearing loss follow-ups and recordkeeping.

~~((You must:~~

*) (1) The employer must make sure that the third-party program is:

((-) (a) Equivalent to an employer program as required by this part;

AND

((-) (b) Uses audiometric testing to evaluate hearing loss.

((*) (2) The employer must make sure a licensed or certified audiologist, otolaryngologist, or other qualified physician administers the third-party program.

((*) (3) The employer must make sure the third-party program has written procedures for:

((-) (a) Communicating with participating employers of program requirements;

((-) (b) Follow-up procedures for detected hearing loss;

((-) (c) Annual review of participating employer programs.

((*) (4) The employer must make sure the following program elements are corrected by ~~((you)) the employer~~ or the third-party program when deficiencies are found:

((-) (a) Noise exposures;

((-) (b) Hearing protection;

((-) (c) Employee training;

((-) (d) Noise controls.

((*) (5) The employer must obtain a review of ~~((your)) the hearing loss prevention program at least once per year, conducted by the third-party program administrator or their representative, in order to:~~

((-) (a) Identify any tasks needing a revised selection of hearing protection;

AND

((-) (b) Provide an overall assessment of the employers' hearing loss prevention activities.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-640 Noise definitions.

A-weighted ((-)). An adjustment to sound level measurements that reflects the sensitivity of the human ear. Used for evaluating continuous or average noise levels.

Audiogram ((-)). A chart, graph, or table resulting from an audiometric test showing an individual's hearing threshold levels as a function of frequency.

Audiologist ((-)). A professional, specializing in the study and rehabilitation of hearing, who is certified by the American Speech, Hearing, and Language Association, or the American Academy of Audiology, and is licensed by the state board of examiners.

Baseline audiogram ((-)). The audiogram against which future audiograms are compared. The baseline audiogram is collected when an employee is first assigned to work with noise exposure. The baseline audiogram may be revised if persistent standard threshold shift (STS) of improvement is found.

Continuous noise ((-)). Noise with peaks spaced no more than one second apart. Continuous noise is measured using sound level meters and noise dosimeters with the slow response setting.

Criterion sound level ((-)). A sound level of ninety decibels. An eight-hour exposure to constant 90 dBA noise is a one hundred percent noise dose exposure.

C-weighted ((-)). An adjustment to sound level measurements that evenly represents frequencies within the range of human hearing. Used for evaluating impact or impulse noise.

Decibel (dB) ((-)). Unit of measurement of sound level. A-weighting, adjusting for the sensitivity of the human ear, is indicated as "dBA." C-weighting, an even reading across the frequencies of human hearing, is indicated as "dBC."

Fast response ((-)). A setting for a sound level meter that will allow the meter to respond to noise events of less than one second. Used for evaluating impulse and impact noise levels.

Hertz (Hz) ((-)). Unit of measurement of frequency, numerically equal to cycles per second.

Impulsive or impact noise ((-)). Noise levels which involve maxima at intervals greater than one second. Impulse and impact noise are measured using the fast response setting on a sound level meter.

Noise dose ((-)). The total noise exposure received by an employee during their shift. It can be expressed as a percentage indicating the ratio of exposure received to the noise exposure received in an eight-hour exposure to constant noise at 90 dBA. It may also be expressed as the sound level that would produce the equivalent exposure during an eight-hour period (TWA_8).

Noise dosimeter ((-)). An instrument that integrates a function of sound pressure over a period of time in such a manner that it directly indicates a noise dose.

Occupational hearing loss ((-)). A reduction in the ability of an individual to hear either caused or contributed to by exposure in the work environment.

Otolaryngologist ((-)). A physician specializing in diagnosis and treatment of disorders of the ear, nose and throat.

Permanent threshold shift ((-)). A hearing level change that has become persistent and is not expected to improve.

Qualified reviewer ((-)). An audiologist, otolaryngologist, or other qualified physician who has experience and training in evaluating occupational audiograms.

Slow response ((-)). A setting for sound level meters and dosimeters in which the meter does not register events of less than about one second. Used for evaluating continuous and average noise levels.

Sound level ((-)). The intensity of noise as indicated by a sound level meter.

Sound level meter ((-)). An instrument that measures sound levels.

Standard threshold shift (STS) ((-)). A hearing level change, relative to the baseline audiogram, of an average of 10 dB or more at 2000, 3000, and 4000 Hz in either ear.

Temporary threshold shift ((-)). A hearing level change that improves. A temporary threshold shift may occur with exposure to noise and hearing will return to normal within a few days. Temporary threshold shifts can be indicators of exposures that lead to permanent hearing loss.

TWA_8 - Equivalent eight-hour time-weighted average sound level ((-)). That sound level, which if constant over an eight-hour period, would result in the same noise

dose measured in an environment where the noise level varies.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-642 Scope. This part applies to all confined spaces and provides requirements to protect employees from the hazards of entering and working in confined spaces. This part applies in any of the following circumstances:

~~((You have))~~ (1) The employer has confined spaces in ~~((your))~~ the workplace.

~~((You))~~ (2) Employees will enter another employer's confined spaces.

~~((You))~~ (3) A contractor will enter ~~((your))~~ the employer's confined spaces.

~~((You))~~ (4) The employer provides confined space rescue services.

~~((You))~~ The employer can use Table 1 to help ~~((you))~~ decide which requirements to follow for confined spaces.

**Table 1
Requirements for Confined Spaces**

For confined spaces that are	The requirements in the following sections apply					
	644	646	648	650	652	654
Permit-required confined spaces	X	X	X	X	X	X
Entered by a contractor	X	X	X	X	X	X
Nonpermit confined spaces	X					X
Never entered	X					
If ((you)) the employer only:						
Uses alternate entry procedures	X	X	X		X	
((Have)) Has a contractor enter ((your)) the space	X					
((Are)) Is a rescue service provider		X	X	X		

Definition:

~~((A))~~ **Confined space** ~~((is))~~. A space that is ALL of the following:

~~((a))~~ (a) Large enough and arranged so an employee could fully enter the space and work.

~~((b))~~ (b) Has limited or restricted entry or exit. Examples of spaces with limited or restricted entry are tanks, vessels, silos, storage bins, hoppers, vaults, excavations, and pits.

~~((c))~~ (c) Not primarily designed for human occupancy.

Notes: ~~((1))~~ 1. Requirements in other chapters may apply to ~~((your))~~ the employer's work. ~~((You))~~ The employer will find some safety and health requirements are addressed on a broad level in this part, while being addressed for a specific application in another rule. When this happens, both requirements apply and should not conflict. When a conflict does occur, ~~((you))~~ the employer needs to follow the more specific requirement.
~~((2))~~ 2. If ~~((you are))~~ the employer is uncertain which requirements to follow, contact ~~((your))~~ the local labor and industries (L&I) office.

~~Inform employees and control entry to permit-required confined spaces.~~

~~WAC 296-307-64404~~

~~Follow these requirements when you contract with another employer to enter your confined space.~~

~~WAC 296-307-64406))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Identify permit-required confined spaces.</u>	<u>WAC 296-307-64402</u>
<u>Inform employees and control entry to permit-required confined spaces.</u>	<u>WAC 296-307-64404</u>
<u>The employer must follow these requirements when contracting with another employer to enter its confined space.</u>	<u>WAC 296-307-64406</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-644 Summary. Identifying and controlling permit-required confined spaces.

~~((You))~~ **Employer responsibility:**

To identify ~~((your))~~ permit-required confined spaces and control employee entry.

~~((You must:~~

~~Identify permit-required confined spaces.~~

~~WAC 296-307-64402~~

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-64402 Identify permit-required confined spaces.

IMPORTANT:

If ~~((your))~~ the employer's workplace contains only non-permit confined spaces and ~~((your))~~ employees do not enter another employer's confined space, ~~((you))~~ the employer may follow only the requirements in:

((-) 1. WAC 296-307-644, Identifying and controlling permit-required confined spaces; and

((-) 2. WAC 296-307-654, Nonpermit confined spaces requirements.

~~((You must:~~

•)) (1) The employer must identify all permit-required confined spaces in your workplace.

((•) (2) The employer must assume any confined space is a permit-required confined space, unless ~~((you))~~ the employer determines the space to be a nonpermit confined space.

~~((If you))~~ (a) If the employer or employees enter the space to determine the hazards, follow the requirements in WAC 296-307-650, Permit entry procedures.

~~((If you))~~ (b) If the employer evaluates the confined space and there are no potential or actual hazards, ~~((you))~~ the employer can consider it to be a nonpermit confined space.

((•) (3) The employer must document ~~((your))~~ its determination that the space is nonpermit, as required by WAC 296-307-654.

Definitions:

((A) Permit-required confined space or permit space ~~((is))~~, A confined space that has one or more of the following characteristics capable of causing death or serious physical harm:

((-) (a) Contains or has a potential to contain a hazardous atmosphere.

((-) (b) Contains a material with the potential for engulfing someone who enters the space.

((-) (c) Has an internal configuration that could allow someone entering to be trapped or asphyxiated by inwardly converging walls or by a floor, which slopes downward and tapers to a smaller cross-section.

((-) (d) Contains any physical hazard. This includes any recognized health or safety hazards including engulfment in solid or liquid material, electrical shock, or moving parts.

((-) (e) Contains any other recognized safety or health hazard that could either:

((•) (i) Impair the ability to self rescue;

OR

((•) (ii) Result in a situation that presents an immediate danger to life or health.

((A) Nonpermit confined space ~~((is))~~, A confined space that does NOT contain actual hazards or potential hazards capable of causing death or serious physical harm.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-64404 Inform employees and control entry to permit-required confined spaces.

~~((You must:))~~

(1) The employer must provide information about confined spaces as follows:

((•) (a) Make available to affected employees and their authorized representatives all information and documents required by this part.

((•) (b) Inform affected employees about the existence, location, and danger of any permit-required confined spaces in ~~((your))~~ the workplace by:

((-) (i) Posting danger signs; or

((-) (ii) Using any other equally effective means to inform employees.

Note: A sign reading "Danger-Permit Required Confined Space, DO NOT ENTER" or using pictures or other similar wording employees can understand would satisfy the requirement for a sign.

~~((You must:))~~

(2) The employer must take effective measures to prevent unauthorized employees from entering permit-required confined spaces.

Note: Examples of measures to prevent employee entry include padlocks, bolted covers, special tools to remove covers, and providing employee training.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-64406 The employer must follow these requirements when ~~((you contract))~~ contracting with another employer to enter ~~((your))~~ its confined space.

IMPORTANT:

The contractor is responsible for following all confined space requirements in this part and in other rules that apply.

~~((You must:~~

•)) The employer must do all of the following if ~~((you))~~ the employer arranges to have another employer (contractor) perform work that involves entry into ~~((your))~~ its permit-required confined space:

((-) (1) Inform the contractor:

((■) (a) That the workplace contains permit-required confined spaces and entry is allowed only if the applicable requirements of this part are met.

((■) (b) Of the identified hazards and ~~((your))~~ experience with each permit-required confined space.

((■) (c) Of any employer required precautions or procedures ~~((you require))~~ for the protection of employees in or near spaces where the contractor will be working.

((-) (2) Coordinate entry operations with the contractor, when either employees or employers from the different companies will be working in or near permit-required confined spaces.

((-) (3) Discuss entry operations with the contractor when they are complete. Include the following in ~~((your))~~ the discussion:

((■) (a) The program followed during confined space entry; and

((■) (b) Any hazards confronted or created.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-646 Summary.

~~((Your))~~ Employer responsibility:

To develop ~~((your))~~ the employer's permit-required confined space program and practices.

IMPORTANT:

This section applies if employees will enter a permit-required confined space.

~~((You must:~~

Develop a written permit required confined space program.

~~WAC 296-307-64602~~

Meet these additional requirements if your employees enter another employer's confined space.

~~WAC 296-307-64604~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Develop a written permit-required confined space program.</u>	<u>WAC 296-307-64602</u>
<u>Meet these additional requirements if employees enter another employer's confined space.</u>	<u>WAC 296-307-64604</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-64602 Develop a written permit-required confined space program.

IMPORTANT:

(*) Identify and evaluate the hazards of permit-required confined spaces and the work performed, to assist ~~((you))~~ the employer in developing ~~((you))~~ its entry program.

~~**((You must:**~~

~~*)~~ **(1)** The employer must develop a written program, before employees enter, that describes the means, procedures, and practices ~~((you))~~ the employer uses for the safe entry of permit-required confined spaces as required by this part. Include the following when applicable to ~~((you))~~ the employer's confined space entry program:

- ~~(-)~~ **(a)** Documentation of permit entry procedures.
- ~~(-)~~ **(b)** Documentation used for alternate entry procedures.
- ~~(-)~~ **(c)** How to reclassify permit-required confined spaces to nonpermit spaces.
- ~~(-)~~ **(d)** Designation of employee roles, such as entrants, attendants, entry supervisors, rescuers, or those who test or monitor the atmosphere in a permit-required space.
- ~~(-)~~ **(e)** Identification of designated employee duties.
- ~~(-)~~ **(f)** Training employees on their designated roles.
- ~~(-)~~ **(g)** How to identify and evaluate hazards.
- ~~(-)~~ **(h)** Use and maintenance of equipment.
- ~~(-)~~ **(i)** How to prevent unauthorized entry.
- ~~(-)~~ **(j)** How to coordinate entry with another employer.
- ~~(-)~~ **(k)** How to rescue entrants.

Note: For alternate entry, ~~((you))~~ the employer's written program only needs to meet the requirements of WAC 296-307-648, Employee training, and WAC 296-307-652, Alternate entry procedures, of this part.

~~**((You must:**~~

~~*)~~ **(2)** The employer must consult with affected employees and their authorized representatives when developing and implementing all aspects of ~~((you))~~ the employer's permit-required confined space program.

(*) **(3)** The employer must make the written program available to employees and their authorized representatives.

~~**((*)**~~ **(4)** The employer must update ~~((you))~~ its written program as necessary.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-64604 Meet these additional requirements if ~~((you))~~ employees enter another employer's confined space.

~~**((You must:**~~

~~*)~~ **(1)** The employer must obtain any available information about permit-required confined space hazards and entry operations from the host employer.

~~**((*)**~~ **(2)** The employer must coordinate entry operations with any other employers whose employees will be working in or near the permit-required confined space.

~~**((*)**~~ **(3)** The employer must inform the host employer, either through a debriefing or during entry operations, about:

~~(-)~~ **(a)** The entry program ~~((you))~~ that will ~~((follow))~~ be followed; and

~~(-)~~ **(b)** Any hazards ~~((you))~~ confronted or created in the space during entry operations.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-648 Summary.

~~**((You))**~~ **Employer responsibility:**

To make sure employees are trained to perform their designated roles safely.

~~**((You must:**~~

~~Provide employee training.~~

~~**WAC 296-307-64802**~~

~~Certify employee proficiency.~~

~~**WAC 296-307-64804**~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Provide employee training.</u>	<u>WAC 296-307-64802</u>
<u>Certify employee proficiency.</u>	<u>WAC 296-307-64804</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-64802 Provide employee training.

~~**((You must:**~~

~~*)~~ **(1)** The employer must provide training to each employee involved in permit-required confined space activities, so they acquire the understanding, knowledge and skills necessary to safely perform assigned duties.

~~(-)~~ **(a)** Establish employee proficiency in their confined space duties.

~~(-)~~ **(b)** Introduce new or revised procedures as necessary.

Note: ~~(*)~~ Employers can determine employee proficiency by:

~~(-)~~ **1.** Observing employee performance during training exercises that simulate actual confined space conditions~~((-))~~;

~~(-)~~ **2.** A comprehensive written examination; or

(-) 3. Any other method that is effective for the employer.

~~((You must:~~

•)) (2) The employer must provide training at the following times:

(-) (a) Before an employee is first assigned to duties covered by this part.

(-) (b) Before there is a change in an employee's assigned duties.

(-) (c) When there is a permit-required confined space hazard for which the employee has not already been trained.

~~((If you have))~~ (d) If the employer has reason to believe that there are either:

(•) (i) Deviations from ~~((your))~~ the employer's procedures for permit-required confined space entry; or

(•) (ii) Employee knowledge or use of ~~((your))~~ the employer's procedures is inadequate.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-64804 Certify employee proficiency.

~~((You must:~~

•)) (1) The employer must certify employee proficiency in their assigned duties.

(•) (2) The employer must make sure the certification:

(-) (a) Contains each employee's name, the trainer's written or electronic signature or initials, and the dates of training.

(-) (b) Is available for inspection by employees and their authorized representatives.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-650 Summary.

~~((Your))~~ **Employer responsibility:**

To establish procedures for the safe permit-required entry of confined spaces.

~~((Implement procedures for entry permits.~~

~~WAC 296-307-65002~~

~~Use an entry permit that contains all required information.~~

~~WAC 296-307-65004~~

~~Keep and review your entry permits.~~

~~WAC 296-307-65006~~

~~Prevent unauthorized entry.~~

~~WAC 296-307-65008~~

~~Provide, maintain, and use proper equipment.~~

~~WAC 296-307-65010~~

~~Evaluate and control hazards for safe entry.~~

~~WAC 296-307-65012~~

~~Make sure you have adequate rescue and emergency services available.~~

~~WAC 296-307-65014~~

~~Use nonentry rescue systems or methods whenever possible.~~

~~WAC 296-307-65016~~

~~Make sure entry supervisors perform their responsibilities and duties.~~

~~WAC 296-307-65018~~

~~Provide an attendant outside the permit-required confined space.~~

~~WAC 296-307-65020~~

~~Make sure entrants know the hazardous conditions and their duties.~~

~~WAC 296-307-65022~~

~~Implement procedures for ending entry.~~

~~WAC 296-307-65024))~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Implement procedures for entry permits.</u>	<u>WAC 296-307-65002</u>
<u>Use an entry permit that contains all required information.</u>	<u>WAC 296-307-65004</u>
<u>Keep and review entry permits.</u>	<u>WAC 296-307-65006</u>
<u>Prevent unauthorized entry.</u>	<u>WAC 296-307-65008</u>
<u>Provide, maintain, and use proper equipment.</u>	<u>WAC 296-307-65010</u>
<u>Evaluate and control hazards for safe entry.</u>	<u>WAC 296-307-65012</u>
<u>Make sure adequate rescue and emergency services are available.</u>	<u>WAC 296-307-65014</u>
<u>Use nonentry rescue systems or methods whenever possible.</u>	<u>WAC 296-307-65016</u>
<u>Make sure entry supervisors perform their responsibilities and duties.</u>	<u>WAC 296-307-65018</u>
<u>Provide an attendant outside the permit-required confined space.</u>	<u>WAC 296-307-65020</u>
<u>Make sure entrants know the hazardous conditions and their duties.</u>	<u>WAC 296-307-65022</u>
<u>Implement procedures for ending entry.</u>	<u>WAC 296-307-65024</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-65002 Implement procedures for entry permits.

~~((You must:~~

•)) (1) The employer must identify and evaluate, before employees enter, potential hazards from:

(-) (a) The permit-required confined space; and

(-) (b) The work to be performed.

(•) (2) The employer must complete an entry permit before entry is authorized, documenting that ~~((you have))~~ the

employer has completed the means, procedures and practices necessary for safe entry and work.

((*) (3) The employer must make sure that entrants or their representatives have an opportunity to observe any monitoring or testing, or any actions to eliminate or control hazards, performed to complete the permit.

((*) (4) The employer must identify the entry supervisor.

((-) Make sure the entry supervisor signs the entry permit, authorizing entry, before the space is entered.

((*) (5) The employer must make the completed permit available to entrants or their authorized representatives at the time of entry.

((-) Do this by either posting the completed permit at the entry location, or by any other equally effective means.

((*) (6) The employer must make sure the duration of the permit does not exceed the time required to complete the assigned task or job identified on the permit.

((*) (7) The employer must note any problems encountered during an entry operation on the permit. Use the information to make appropriate revisions to ((your)) the employer's program, entry operations, means, systems, procedures and practices.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-65004 Use an entry permit that contains all required information.

~~((You must:~~

*) (1) The employer must make sure ((your)) its entry permit identifies **all** of the following that apply to ((your)) its entry operation:

((-) (a) The space to be entered.

((-) (b) Purpose of the entry.

((-) (c) Date and the authorized duration of the entry permit.

((-) (d) Hazards of the space to be entered.

((-) (e) Acceptable entry conditions.

((-) (f) Results of initial and periodic tests performed to evaluate and identify the hazards and conditions of the space, accompanied by the names or initials of the testers and by an indication of when the tests were performed.

((-) (g) Appropriate measures used before entry to isolate the space, and eliminate or control hazards.

((*) Examples of appropriate measures include the lock-out or tagging of equipment and procedures for purging, inerting, ventilating, and flushing permit-required confined spaces.

((-) (2) Names of entrants and current attendants.

((*) (3) Other means include the use of rosters or tracking systems as long as the attendant can determine quickly and accurately, for the duration of the permit, which entrants are inside the space.

((-) (a) The current entry supervisor.

((-) (b) A space for the signature or initials of the original supervisor authorizing entry.

((-) (c) Communication procedures for entrants and attendants to maintain contact during the entry.

((-) (d) Equipment provided for safe entry, such as:

((*) (i) Personal protective equipment (PPE).

((*) (ii) Testing equipment.

((*) (iii) Communications equipment.

((*) (iv) Alarm systems.

((*) (v) Rescue equipment.

((-) (e) Rescue and emergency services available, and how to contact them. Include equipment to use, and names and contact information.

((-) (f) Other information needed for safety in the particular confined space.

((-) (g) Additional permits issued for work in the space, such as for hot work.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-65006 Keep and review ((your)) entry permits.

~~((You must:~~

*) (1) The employer must keep entry permits for at least one year.

((*) (2) The employer must keep entry permits or other atmospheric monitoring records that show the actual atmosphere an employee entered or worked in, as employee exposure records.

((*) (3) The employer must review ((your)) its permit-required confined space entry program as follows:

((-) Conduct a review when ((you have any)) there is reason to believe ((your)) its entry program may not protect employees, and revise ((your)) the program before allowing subsequent entries.

Note: Examples of circumstances requiring the review of your program include the following:

((*) 1. There is unauthorized entry of a permit space.

((*) 2. A permit space hazard not covered by the permit is found.

((*) 3. A condition prohibited by the permit occurs.

((*) 4. An injury or near-miss occurs during entry.

((*) 5. There is a change in the use or configuration of a permit space.

((*) 6. An employee complains about the effectiveness of the program.

~~((You must:~~

*) (4) The employer must review canceled entry permits within one year following each entry to evaluate:

((-Your)) (a) The employer's permit-required confined space program.

((-) (b) The protection provided to employees entering permit-required confined spaces.

((*) (5) The employer must update ((your)) its written permit-required confined space entry program as necessary.

Note: Employers may perform a single annual review covering all entries performed during a twelve-month period. If no entry is performed during a twelve-month period, no review is necessary.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-65008 Prevent unauthorized entry.

~~((You must:~~

*) The employer must implement measures necessary to prevent unauthorized entry into permit-required confined spaces, when conducting authorized entry.

- Notes:**
- ((*) 1. When removing entrance covers to open the confined space, protect entrants and those outside the confined space from hazards.
 - ((*) 2. Examples of measures to prevent unauthorized entry are signs, barricades, warning tape, and an attendant.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-65010 Provide, maintain, and use proper equipment.

~~((You must:~~

- *) (1) The employer must provide the equipment in Table 2, when needed and at no cost to employees.
- ((*) (2) The employer must make sure that employees use provided equipment properly.
- ((*) (3) The employer must maintain the provided equipment.

Table 2

Equipment Provided to Employees at No Cost

Type of equipment	For
Testing and monitoring equipment	Evaluating permit-required confined space conditions
Ventilating equipment	Obtaining and maintaining acceptable entry conditions
Communication equipment	Effective communication between the attendant and the entrants and to initiate rescue when required
Personal protective equipment (PPE)	Protecting employees from hazards of the space or the work performed
Lighting equipment	Employees to see well enough to work safely and to exit the space quickly in an emergency
Barriers or shields, such as pedestrian, vehicle or other barriers	Protecting employees from hazards outside of the space
Ladders	Safe entry and exit by entrants
Rescue and emergency equipment, except for equipment provided by the rescue service provider	Safe and effective rescue
Any other equipment	Safe entry into and rescue from permit-required confined spaces

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-65012 Evaluate and control hazards for safe entry.

- ((*) (1) Evaluate and control hazards for safe entry into permit-required confined spaces by doing all the following:
 - ((-) (a) Test for atmospheric hazards, in this order:
 - ((■) (i) Oxygen.
 - ((■) (ii) Combustible gases and vapors.
 - ((■) (iii) Toxic gases and vapors.
 - ((-) (b) Provide each entrant or their authorized representative an opportunity to observe any of the following:
 - ((■) (i) Preentry testing.
 - ((■) (ii) Subsequent testing.
 - ((■) (iii) Monitoring of permit-required spaces.
 - ((-) (c) Reevaluate the permit-required space in the presence of any entrant, or their authorized representative, who requests this to be done because they have reason to believe that the evaluation of that space may not have been adequate.
 - ((-) (d) Upon request, immediately provide each entrant or their authorized representative, with the results of any testing required by this rule.
 - ((-) (e) Continuously monitor conditions in areas where entrants are working, when isolation of the space is not feasible.
 - ((*) (i) Examples would be a large space or space that is part of a continuous system, such as a sewer.
 - ((*) (ii) Evaluate space conditions during entry as follows:

Table 3
Evaluating Space Conditions

((You) The employer must:	In order to
Test conditions before entry	Determine that acceptable entry conditions exist before entry is authorized by the entry supervisor
Test or evaluate space conditions during entry	Determine that acceptable entry conditions are being maintained during entry operations
Evaluate entry operations	Make sure entrants of more than one employer working at the same time in or around a permit-required confined space, do not endanger each other

IMPORTANT:

- This section applies to both:
- ((*) 1. Employers whose employees use permit entry procedures; and
 - ((*) 2. Employers who provide rescue services.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-65014 Make sure ~~((you have))~~ adequate rescue and emergency services are available.

~~((You must:))~~

(1) The employer must make sure ~~((you))~~ they have adequate rescue and emergency services available during ~~((your))~~ their permit-required confined space entry operations.

~~((★))~~ (a) Evaluate and select rescue teams or services who can:

~~((-))~~ (i) Respond to a rescue call in a timely manner. Timeliness is based on the identified hazards. Rescuers must have the capability to reach potential victims within an appropriate time frame based on the identified permit space hazards.

~~((-))~~ (ii) Proficiently rescue employees from a permit-required confined space in ~~((your))~~ the workplace. Rescuers must have the appropriate equipment for the type of rescue.

~~((★))~~ (b) Make sure that at least one member of the rescue team or service holds a current certification in first aid and cardiopulmonary resuscitation (CPR).

~~((★))~~ (c) Inform each rescue team or service about the hazards they may confront when called to perform rescue.

~~((★))~~ (d) Provide the rescue team or service with access to all permit spaces from which rescue may be necessary.

~~((-))~~ This will allow them to develop appropriate rescue plans and to practice rescue operations.

Note: What will be considered timely will vary according to the specific hazards involved in each entry. For example, WAC 296-307-594, Respirators, requires that employers provide a standby person or persons capable of immediate action to rescue employee(s) for work areas considered to contain an IDLH atmosphere.

~~((You must:))~~

(2) The employer must provide employees, assigned to provide permit-required confined space rescue and emergency services, with:

~~((★))~~ (a) Personal protective equipment (PPE) needed for safe entry.

~~((★))~~ (b) Other equipment required to conduct rescues safely.

~~((★))~~ (c) Training so they are:

~~((-))~~ (i) Proficient in the use of the PPE and other equipment.

~~((-))~~ (ii) Proficient as an entrant of permit-required confined spaces.

~~((-))~~ (iii) Able to safely perform assigned rescue and emergency duties.

~~((-))~~ (iv) Knowledgeable in basic first aid and cardiopulmonary resuscitation (CPR).

~~((★))~~ (d) Practice sessions for permit-required confined space rescues **at least** once every twelve months where dummies, manikins, or actual persons are removed from either:

~~((-))~~ (i) The actual permit spaces; or

~~((-))~~ (ii) Representative permit spaces that simulate the opening size, configuration, and accessibility, of permit spaces where rescue will be performed.

(3) The employer must establish procedures for:

~~((★))~~ (a) Contacting rescue and emergency services.

~~((★))~~ (b) Rescuing entrants from permit-required confined spaces.

~~((★))~~ (c) Providing necessary emergency services to rescued entrants.

~~((★))~~ (d) Preventing unauthorized persons from attempting a rescue.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-65016 Use nonentry rescue systems or methods whenever possible.

~~((You must:))~~

~~((★))~~ (1) The employer must use nonentry retrieval systems or methods to rescue entrants in a permit-required confined space unless this:

~~((-))~~ (a) Would increase the overall risk of injury to entrants; or

~~((-))~~ (b) Would not contribute to the rescue of the entrant.

~~((★))~~ (2) The employer must make sure each entrant uses a chest or full-body harness, with a retrieval line attached to the harness at one of the following locations:

~~((-))~~ (a) At the center of the employee's back, near shoulder level.

~~((-))~~ (b) Above the employee's head.

~~((-))~~ (c) At another point which presents a profile small enough for the successful removal of the employee.

~~((★))~~ (3) The employer must attach the retrieval line to a mechanical device or fixed point outside the space, so rescue can begin as soon as necessary.

~~((★))~~ (4) The employer must make sure a mechanical device is available to retrieve entrants from vertical spaces more than five feet (1.52 m) deep.

Note: When ~~((you))~~ the employer can demonstrate that the use of a chest or full-body harness is not feasible or creates a greater hazard, then ~~((you))~~ the employer may use wristlets or another method shown to be the safest and most effective alternative.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-65018 Make sure entry supervisors perform their responsibilities and duties.

~~((You must:))~~

~~((★))~~ The employer must make sure that an entry supervisor:

~~((-))~~ (1) Authorizes the entry into a permit-required confined space by signing the entry permit.

~~((-))~~ (2) Oversees entry operations.

~~((-))~~ (3) Knows about the hazards that may be faced during entry, including the mode, signs or symptoms, and consequences of the exposure.

~~((-))~~ (4) Verifies and checks **all** of the following:

~~((■))~~ (a) The appropriate entries have been made on the permit.

~~((■))~~ (b) All tests specified by the permit have been conducted.

~~((■))~~ (c) All procedures and equipment specified by the permit are in place before approving the permit and allowing entry to the space.

~~((-))~~ (5) Terminates the entry and cancels the permit when:

~~((■))~~ (a) The assigned task or job has been completed.

~~((■))~~ (b) A condition in the space that is not covered by the entry permit is discovered.

((-) (6) Verifies that rescue services are available and that there is a way to contact them.

((-) (7) Removes unauthorized individuals who enter or attempt to enter the permit-required confined space during entry operations.

((-) (8) Determines that entry operations remain consistent with the terms of the entry permit and acceptable entry conditions are maintained:

((■) (a) Whenever responsibility for a permit-required space entry operation is transferred; and

((■) (b) At regular intervals dictated by the hazards and operations performed within the space.

Notes: ((*) 1. Make sure entry supervisors have the required knowledge and proficiency to perform the job duties and responsibilities required by this part.

((*) 2. The entry supervisor may also perform other duties under this part, such as attendant or entrant, if they are trained and proficient in those duties.

((*) 3. The responsibility of the entry supervisor may be passed from one supervisor to another during an entry operation.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-65020 Provide an attendant outside the permit-required confined space.

IMPORTANT:

((*) 1. The number of attendants assigned should be tailored to the requirements of the space and the work performed.

~~((*) 1.)~~ 2. The employer needs to assess if it is appropriate or possible to have multiple permit spaces monitored by a single attendant, or have an attendant stationed at a location outside each space. Video cameras and radios are examples of tools that may assist an attendant monitoring more than one space.

((*) 3. Attendants may be stationed at any location outside the permit-required confined space if the duties described in this section can be effectively performed for each space that is monitored.

~~((You must:))~~

~~(*)~~ (1) The employer must provide at least one attendant outside the permit-required confined space during entry operations.

((*) (2) The employer must make sure each permit-required confined space attendant:

((-) (a) Understands the hazards that may be faced during entry, including the mode, signs or symptoms, and results of exposure to the hazards.

((-) (b) Is aware of the behavioral effects of exposure to the hazard.

((-) (c) Continuously maintains an accurate count of entrants in the space.

((-) (d) Maintains an accurate record of who is in the permit-required confined space.

((-) (e) Communicates with entrants as necessary to monitor their status or alert them of the need to evacuate the space.

((-) (f) Monitors activities inside and outside the space to determine if it is safe for entrants to remain in the space.

((-) (g) Orders entrants to evacuate the space immediately if any of the following conditions occur:

((■) (i) A prohibited condition.

((■) (ii) The behavioral effects of hazardous exposure on an entrant.

((■) (iii) A situation outside the space that could endanger entrants.

((■) (iv) The attendant cannot effectively and safely perform all the duties required in this part.

((-) (h) Takes the following actions when unauthorized persons approach or enter a space:

((■) (i) Warns unauthorized persons to stay away from the space.

((■) (ii) Tells the unauthorized persons to exit immediately if they have entered the space.

((■) (iii) Informs entrants and the entry supervisor if unauthorized persons have entered the space.

((-) (i) Performs nonentry rescues as specified (~~by you~~) in the employer's rescue procedure.

((-) (j) Has the means to respond to an emergency affecting one or more of the permit spaces being monitored without preventing performance of the attendant's duties to the other spaces being monitored.

((-) (k) Carries out no duties that might interfere with their primary duty to monitor and protect the entrants.

((-) (l) Calls for rescue and other emergency services as soon as entrants may need assistance to escape from the space.

((-) (m) Monitors entry operations until relieved by another attendant or all entrants are out of the space.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-65022 Make sure entrants know the hazardous conditions and their duties.

~~((You must:))~~

~~(*)~~ The employer must make sure that all entrants:

((-) (1) Know the hazards they may face during entry, including the mode, signs or symptoms, and results of exposure to the hazards.

((-) (2) Use equipment properly.

((-) (3) Communicate with the attendant as necessary so the attendant can:

((■) (a) Monitor entrant status.

((■) (b) Alert entrants of the need to evacuate.

((-) (4) Alert the attendant whenever either of these situations exist:

((■) (a) A warning sign or symptom of exposure to a dangerous situation such as, behavioral changes, euphoria, giddiness potentially from lack of oxygen or exposure to solvents.

((■) (b) A prohibited condition.

((-) (5) Exit from the permit-required confined space as quickly as possible when one of the following occurs:

((■) (a) The attendant or entry supervisor gives an order to evacuate.

((■) (b) The entrant recognizes any warning sign or symptom of exposure to a dangerous situation.

((■) (c) The entrant detects a prohibited condition.

~~((■)) (d) An evacuation alarm is activated.~~

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-65024 Implement procedures for ending entry.

~~((You must:~~

~~Make sure you)) The employer must terminate ((the)) entry when entry operations are completed, including securing an entrance cover and canceling the permit.~~

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-652 Alternate entry procedures.

Summary:

~~((You#))~~ **Employer responsibility:**

To choose alternate entry procedures for spaces where the only hazard is a hazardous atmosphere.

~~((IMPORTANT:~~

~~In addition to this section, you also need to meet the requirements in the following sections of this part:~~

~~—WAC 296-307-644, Identifying and controlling permit-required confined spaces.~~

~~—WAC 296-307-646, Permit-required confined space program.~~

~~—WAC 296-307-648, Employee training.~~

~~**You must:**~~

~~Make sure the following conditions are met if using alternate entry procedures:~~

~~**WAC 296-307-65202**~~

~~Follow these alternate entry procedures for permit-required confined spaces.~~

~~**WAC 296-307-65204))**~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Identifying and controlling permit-required confined spaces.</u>	<u>WAC 296-307-644</u>
<u>Permit-required confined spaces program.</u>	<u>WAC 296-307-646</u>
<u>Employee training.</u>	<u>WAC 296-307-648</u>
<u>Make sure the following conditions are met if using alternate entry procedures.</u>	<u>WAC 296-307-65202</u>
<u>Follow these alternate entry procedures for permit-required confined spaces.</u>	<u>WAC 296-307-65204</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-65202 Make sure the following conditions are met if using alternate entry procedures.

~~((You must:~~

*) (1) The employer must make sure, when using alternate entry procedures, instead of permit entry procedures, that ~~((you have))~~ it has monitoring and inspection data that supports the following:

(-) (a) That the only hazard of the permit-required confined space is an actual or potentially hazardous atmosphere.

(-) (b) That continuous forced air ventilation alone is all that is needed to maintain the permit-required confined space for safe entry.

(*) (2) The employer must make sure an entry to obtain monitoring and inspection data or to eliminate hazards is performed according to WAC 296-307-500, Permit entry procedures.

(*) (3) The employer must make sure all documentation produced is available to each affected employee and their authorized representative.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-65204 Follow these alternate entry procedures for permit-required confined spaces.

~~((You must:~~

*) (1) The employer must use the following alternate entry procedures:

(-) Eliminate any unsafe conditions before removing an entrance cover.

(■) (a) When entrance covers are removed, promptly guard the opening with a railing, temporary cover, or other temporary barrier to prevent accidental falls through the opening and protect entrants from objects falling into the space.

(■) (b) Certify that preentry measures have been taken (such as safe removal of the cover and having protection needed to gather preentry data), with the date, location of the space, and signature of the person certifying.

(*) (2) The employer must make the preentry certification available before entry to each entrant.

(-) (a) Before an employee enters the confined space, test the internal atmosphere with a calibrated, direct-reading instrument for all of the following, in this order:

(■) (i) Oxygen content.

(■) (ii) Flammable gases and vapors.

(■) (iii) Potential toxic air contaminants.

(-) (b) Provide entrants, or their authorized representatives, with an opportunity to observe the preentry and periodic testing.

(-) (c) Make sure the atmosphere within the space is not hazardous when entrants are present.

(-) (d) Use continuous forced air ventilation, as follows:

(■) (i) Wait until the forced air ventilation has removed any hazardous atmosphere before allowing entrants into the space.

(■) (ii) Direct forced air ventilation toward the immediate areas where employees are, or will be, and continue ventilation until all employees have left the space.

(*) (3) The employer must provide the air supply from a clean source and make sure it does not increase hazards in the space.

((-)) (a) Test the atmosphere within the space as needed to make sure hazards do not accumulate.

((-)) (b) If a hazardous atmosphere is detected during entry, do all of the following:

((■)) (i) Evacuate employees from the space immediately.

((■)) (ii) Evaluate the space to determine how the hazardous atmosphere developed.

((■)) (iii) Implement measures to protect employees from the hazardous atmosphere before continuing the entry operation.

((■)) (iv) Verify the space is safe for entry before continuing the entry operation.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-654 Nonpermit confined spaces requirements.

Summary:

IMPORTANT:

A confined space may be classified as a nonpermit confined space for as long as the hazards remain eliminated. Once a hazard is present, ((you)) the employer must follow all requirements of this part that apply.

~~((You))~~ **Employer responsibility:**

To make sure any space ((you classify)) classified as nonpermit does not have the potential to contain serious health or safety hazards.

~~((You must:~~

~~Follow these requirements when classifying a confined space as a nonpermit confined space.~~

~~**WAC 296-307-65402**~~

~~Reevaluate nonpermit confined spaces if hazards develop.~~

~~**WAC 296-307-65404))**~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Follow these requirements when classifying a confined space as a nonpermit confined space.</u>	<u>WAC 296-307-65402</u>
<u>Reevaluate nonpermit confined spaces if hazards develop.</u>	<u>WAC 296-307-65404</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-65402 Follow these requirements when classifying a confined space as a nonpermit confined space.

~~((You must:~~

•) (1) The employer must make sure the confined space meets these conditions to be classified as nonpermit confined spaces:

((-) (a) The confined space does not contain an actual or potential hazardous atmosphere.

((-) (b) The confined space does not contain hazards capable of causing death or serious physical harm. This includes any recognized health or safety hazards including engulfment in solid or liquid material, electrical shock, or moving parts.

~~((If you))~~ (c) If the employer must enter to remove hazards, the space must be treated as a permit-required confined space until hazards have been eliminated.

Notes:

((•)) 1. Controlling atmospheric hazards through forced air ventilation does not eliminate the hazards.

~~((You))~~ 2. The employer should evaluate the use of lockout-tagout, as covered in WAC 296-307-320, to determine if using it fully eliminates the hazard.

~~((You are))~~ 3. The employer is allowed to use alternate entry procedures covered in WAC 296-307-652, if ((you)) the employer can demonstrate that forced air ventilation alone will control all hazards in the space.

~~((You must:~~

•) (2) The employer must document how ((you)) the employer determined the confined space contained no permit-required confined space hazards. Certify this documentation with the following:

((-) (a) Date.

((-) (b) Location of the space.

((-) (c) Signature of the person making the determination.

((•)) (3) The employer must make the certification available to each entrant, or their authorized representative.

Note:

This certification must be completed every time a permit-required confined space is reclassified as a nonpermit space.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-65404 Reevaluate nonpermit confined spaces if hazards develop.

~~((You must:~~

•) (1) The employer must reclassify a nonpermit confined space to a permit-required confined space, if necessary, when changes in the use or configuration of the space increase the hazards to entrants.

((•)) (2) The employer must make sure all employees exit the space if hazards develop. ((You)) The employer must then reevaluate the space and determine whether it must be reclassified as a permit-required confined space.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-656 Definitions.

Acceptable entry conditions((•)). The conditions that must exist in a permit-required confined space to allow safe entry and work.

Attendant((•)). An individual stationed outside one or more permit-required confined spaces to monitor the entrants.

Blanking or blinding((•)). The absolute closure of a pipe, line, or duct by fastening a solid plate (such as a spectacle blind or a skillet blind) that completely covers the bore. It

is capable of withstanding the maximum pressure of the pipe, line, or duct with no leakage beyond the plate.

Confined space((+)). A space that is **all** of the following:

((*) (a) Large enough and arranged so an employee could fully enter the space and work.

((*) (b) Has limited or restricted entry or exit. Examples of spaces with limited or restricted entry are tanks, vessels, silos, storage bins, hoppers, vaults, excavations, and pits.

((*) (c) Not primarily designed for human occupancy.

Double block and bleed((+)). The closure of a line, duct, or pipe by closing and locking or tagging two in-line valves and by opening and locking or tagging a drain or vent valve in the line between the two closed valves.

Emergency((+)). Any occurrence (including any failure of hazard control or monitoring equipment) or event internal or external to the permit-required confined space that could endanger authorized entrants.

Engulfment((+)). The surrounding capture of a person by a liquid or finely divided (flowable) solid substance that can be inhaled to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction, or crushing.

Enter (entry)((+)). The action by which a person passes through an opening into a permit-required confined space and includes work activities in that space. Entry is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.

Note: If the opening is large enough for the worker to fully enter the space, a permit is required even for partial body entry. Permits are not required for partial body entry where the opening is not large enough for full entry, although other rules such as lock-out-tagout, WAC 296-307-320 or respiratory hazards, WAC 296-307-624 may apply.

Entrant((+)). An employee who is authorized by the employer to enter a permit-required confined space.

Entry permit (permit)((+)). The written or printed document that is provided by ~~((you))~~ the employer to allow and control entry into a permit-required confined space and that contains the information required in WAC 296-307-650, Permit entry procedures.

Entry supervisor((+)). The person (such as the employer, crew leader, or crew chief) responsible for:

((*) (a) Determining if acceptable entry conditions are present at a permit-required confined space where entry is planned;

((*) (b) Authorizing entry and overseeing entry operations; and

((*) (c) Terminating entry as required.

Hazardous atmosphere((+)). 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-required confined space), injury, or acute illness caused by one or more of the following:

((*) (a) Flammable gas, vapor, or mist in excess of ten percent of its lower flammable limit (LFL).

((*) (b) 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 (1.52 m) or less.

((*) (c) Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent.

((*) (d) Atmospheric concentration of any substance which may exceed a permissible exposure limit. For additional information about atmospheric concentration, see chapter 296-62 WAC, Parts F, G, and I, General occupational health standards and WAC 296-307-624, Respiratory hazards.

Note: An airborne concentration of a 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 definition.

((*) (e) Any other atmospheric condition that is immediately dangerous to life or health.

Note: ~~((you))~~ The employer can find guidance on establishing acceptable atmospheric conditions for air contaminants, which have no WISHA-determined doses or permissible exposure limits using other sources of information, such as:

((*) 1. Material safety data sheets required by WAC 296-307-550, Employer chemical hazard communication.

((*) 2. Published information.

((*) 3. Internal documents.

Hot work permit((+)). A written authorization to perform operations, for example, riveting, welding, cutting, burning, and heating, that can provide a source of ignition.

Immediately dangerous to life or health (IDLH)((+)). Any of the following conditions:

((*) (a) An immediate or delayed threat to life.

((*) (b) Anything that would cause irreversible adverse health effects.

((*) (c) Anything that would interfere with an individual's ability to escape unaided from a permit-required confined space.

Note: Some materials - hydrogen fluoride gas and cadmium vapor, for example - may produce immediate transient effects that, even if severe, may pass without medical attention, but are followed by sudden, possibly fatal collapse twelve to seventy-two hours after exposure. The victim "feels normal" after recovery from transient effects until collapse. Such materials in hazardous quantities are considered to be "immediately" dangerous to life or health (IDLH).

Inerting((+)). The displacement of the atmosphere in a permit-required confined space by a noncombustible gas (such as nitrogen) to such an extent that the resulting atmosphere is noncombustible.

Note: This procedure produces an IDLH oxygen-deficient atmosphere.

Isolation((+)). The process by which a permit-required confined space is removed from service and completely protected against the release of energy and material into the space by such means as:

(a) Blanking or blinding;

(b) Misaligning or removing sections of lines, pipes, or ducts;

(c) A double block and bleed system;

(d) Lockout or tagout of all sources of energy; or

(e) Blocking or disconnecting all mechanical linkages.

Line breaking((+)). The intentional opening of a pipe, line, or duct that is or has been carrying flammable, corro-

sive, or toxic material, an inert gas, or any fluid at a volume, pressure, or temperature capable of causing injury.

Nonpermit confined space((+)). A confined space that does NOT contain actual hazards or potential hazards capable of causing death or serious physical harm.

Oxygen deficient atmosphere((+)). An atmosphere containing less than 19.5 percent oxygen by volume.

Oxygen enriched atmosphere((+)). An atmosphere containing more than 23.5 percent oxygen by volume.

Permit-required confined space or permit space((+)). A confined space that has one or more of the following characteristics capable of causing death or serious physical harm:

((*) (a) Contains or has a potential to contain a hazardous atmosphere.

((*) (b) Contains a material with the potential for engulfing someone who enters.

((*) (c) Has an internal configuration that could allow someone entering to be trapped or asphyxiated by inwardly converging walls or by a floor, which slopes downward and tapers to a smaller cross section.

((*) (d) Contains any physical hazard. This includes any recognized health or safety hazards including engulfment in solid or liquid material, electrical shock, or moving parts.

((*) (e) Contains any other recognized serious safety or health hazard that could either:

((-) (i) Impair the ability to self-rescue; or

((-) (ii) Result in a situation that presents an immediate danger to life or health.

Permit-required confined space program((+)). An overall program for:

((*) (a) Controlling and appropriately protecting employees from permit-required confined space hazards; and

((*) (b) Regulating employee entry into permit-required confined spaces.

Prohibited condition((+)). Any condition in a permit-required confined space that is not allowed by the permit during the authorized entry period.

Rescue service((+)). The personnel designated to rescue employees from permit-required confined spaces.

Retrieval system((+)). The equipment used for nonentry rescue of persons from permit-required confined spaces, such as a retrieval line, full-body harness or wristlets, and a lifting device or anchor.

Testing((+)). The process of identifying and evaluating the hazards that entrants may be exposed to in a permit-required confined space. Testing includes specifying the tests that are to be performed in the permit-required confined space.

Note: Testing allows employers to devise and implement adequate controls to protect entrants during entry, and to determine if acceptable entry conditions are present.

AMENDATORY SECTION (Amending WSR 06-02-060, filed 1/3/06, effective 4/1/06)

WAC 296-307-704 Scope. ((What is the purpose of WAC 296-307-704,)) Emergency response to hazardous substance releases((?)).

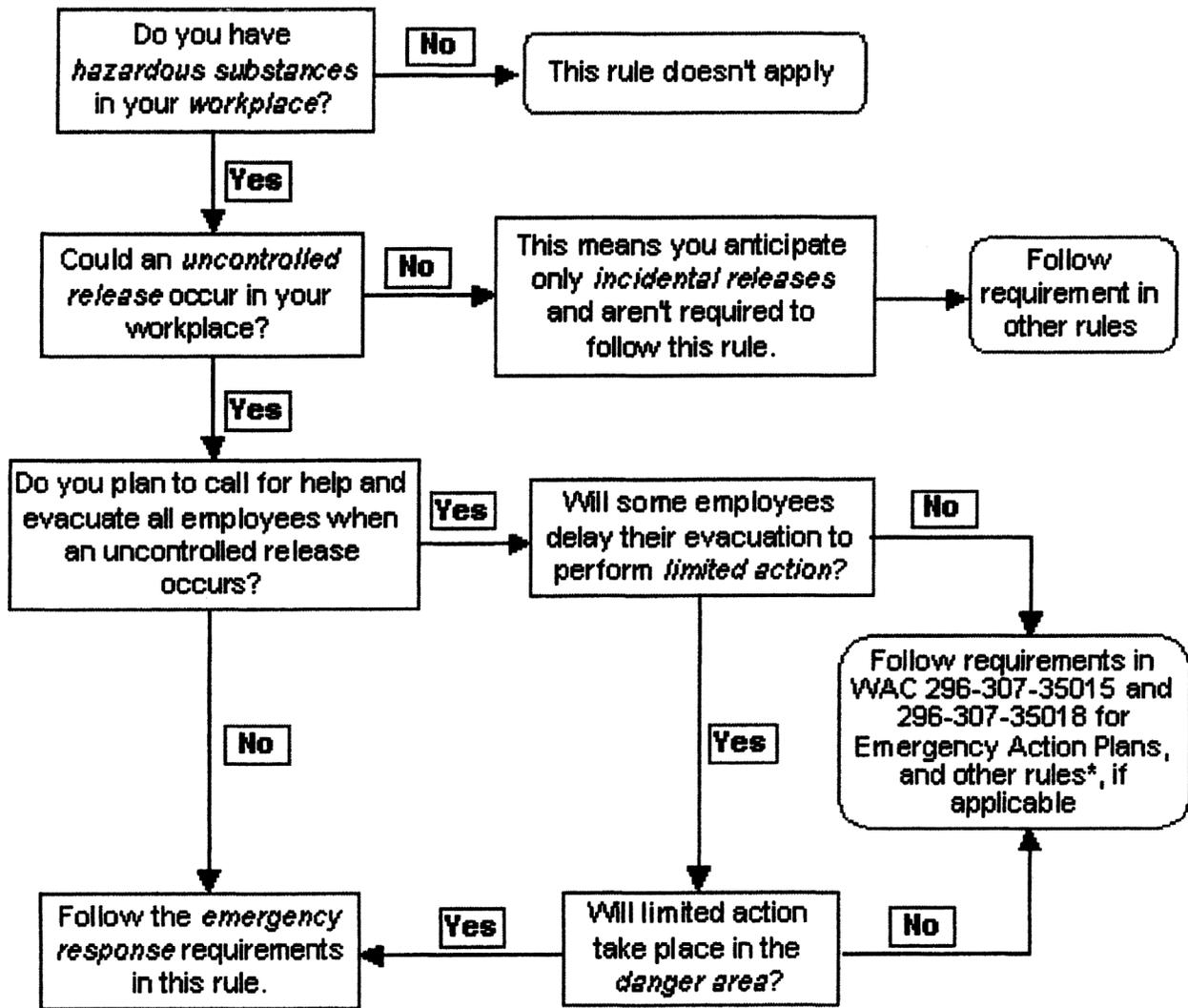
To state the minimum requirements that help ((you)) the employer protect the safety and health of ((your)) its employ-

ees during a response to hazardous substance releases in ((your)) the employer's workplace or any other location.

((Do the)) Requirements of this rule that apply to ((your)) the employer's workplace((?)).

This section applies if ((your)) the employer's employees are, or could become, involved in responding to uncontrolled releases of hazardous substances in ((your)) the workplace or any other location. Use the scope flow chart, and definitions that follow, to determine if this section applies to ((your)) the employer's workplace(s). Defined words are *italicized* in the flow chart.

307 - FLOWCHART



*The flow chart references other rules applicable to (your) the workplace depending on conditions and hazards.

Examples include:

(*) (1) Chapter 296-828 WAC, Hazardous chemicals in laboratories.

(*) (2) WAC 296-307-594, Respiratory protection.

Definitions ((applicable)) that apply to the flow chart (see WAC 296-307-70480 for additional definitions used in this section):

Danger area. Areas where conditions pose a serious danger to employees, such as areas where:

(*) (a) Immediately dangerous to life or health (IDLH) conditions could exist;

OR

(*) (b) High levels of exposure to toxic substances could exist;

OR

(*) (c) There is a potential for exceeding the lower explosive limit (LEL), also known as the lower flammability limit (LFL), of a substance.

Emergency response. A response to an anticipated release of a hazardous substance that is, or could become, an uncontrolled release.

Hazardous substance. Any biological, radiological, or chemical substance that can have adverse effects on humans. (See WAC 296-307-70480 for a more specific definition.)

Immediately dangerous to life or health (IDLH). Any atmospheric condition that would:

(*) (a) Cause an immediate threat to life;

(*) (b) Cause permanent or delayed adverse health effects;

(*) (c) Interfere with an employee's ability to escape.

Incidental release. A release that can be safely controlled at the time of the release and does not have the potential to become an uncontrolled release.

Example of a situation that results in an incidental release:

A tanker truck is receiving a load of hazardous liquid when a leak occurs. The driver knows the only hazard from the liquid is minor skin irritation. The employer has trained the driver on procedures and

provided equipment to use for a release of this quantity. The driver puts on skin protection and stops the leak. A spill kit is used to contain, absorb, and pick up the spilled material for disposal.

Limited action. Action necessary to:

(*) (a) Secure an operation during emergency responses;

OR

(*) (b) Prevent an incident from increasing in severity.

Examples include shutting down processes and closing emergency valves.

Release. A spill, leak, or other type of hazardous substance discharge.

Uncontrolled release. A release where significant safety and health risks could be created. Releases of hazardous substances that are either incidental or could not create a safety or health hazard (i.e., fire, explosion or chemical exposure) are not considered to be uncontrolled releases.

(a) Examples of conditions that could create a significant safety and health risk:

(*) (i) Large-quantity releases;

(*) (ii) Small-releases that could be highly toxic;

(*) (iii) Airborne exposures that could exceed a WISHA permissible exposure limit or a published exposure limit and employees are not adequately trained or equipped to control the release.

(b) Example of an uncontrolled release:

A forklift driver knocks over a container of a solvent-based liquid, releasing the contents onto the warehouse floor. The driver has been trained to recognize the vapor is flammable and moderately toxic when inhaled. The driver has not been trained or provided appropriate equipment to address this type of spill. In this situation, it is not safe for the driver to attempt a response. The driver needs to notify someone of the release so an emergency response can be initiated.

Workplace.

(*) (a) A fixed facility;

OR

(*) (b) A temporary location (such as a traffic corridor);

OR

(*) (c) Locations where employees respond to emergencies.

Summary:

~~(You)~~ **Employer responsibility:**

To anticipate, plan for, and manage emergency response operations so employees are protected from hazardous substances and conditions.

Note: Other chapters may apply to ~~(you)~~ the employer's workplace, such as:

(*) Chapter 296-62 WAC, General occupational health standards.

~~(You)~~ The employer will find some safety and health requirements (for example, personal protective equipment) are addressed on a general level in the core rules, while being addressed for a specific application in this section. When this happens, both requirements apply and should not conflict.

If ~~(you are)~~ the employer is uncertain which requirements to follow, ~~(you)~~ the employer must comply with the more protective requirement. Contact ~~(your)~~ the local L&I office if ~~(you need)~~ assistance is needed in making this determination.

~~(You must:~~

~~WAC 296-307-70410 Planning~~

~~WAC 296-307-70415 Training~~

~~WAC 296-307-70420 Medical surveillance~~

~~WAC 296-307-70425 Keep records~~

~~WAC 296-307-70430 Incident requirements~~

~~WAC 296-307-70435 Implement and maintain an incident command system (ICS) (incident command system)~~

~~WAC 296-307-70440 Prepare skilled support personnel~~

~~WAC 296-307-70445 Make sure the incident commander oversees activities during the response~~

~~WAC 296-307-70450 Use the buddy system in danger areas~~

~~WAC 296-307-70455 Provide rescue and medical assistance~~

~~WAC 296-307-70460 Personal protective equipment~~

~~WAC 296-307-70465 Control hazards created by personal protective equipment (PPE)~~

~~WAC 296-307-70470 Use personal protective equipment (PPE) properly~~

~~WAC 296-307-70475 Postemergency response~~

~~WAC 296-307-70480 Definitions.)~~

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Planning.</u>	<u>WAC 296-307-70410</u>
<u>Training.</u>	<u>WAC 296-307-70415</u>
<u>Medical surveillance.</u>	<u>WAC 296-307-70420</u>
<u>Keep records.</u>	<u>WAC 296-307-70425</u>
<u>Incident requirements.</u>	<u>WAC 296-307-70430</u>
<u>Implement and maintain an incident command system (ICS) (incident command system).</u>	<u>WAC 296-307-70435</u>
<u>Prepare skilled support personnel.</u>	<u>WAC 296-307-70440</u>
<u>Make sure the incident commander oversees activities during the response.</u>	<u>WAC 296-307-70445</u>
<u>Use the buddy system in danger areas.</u>	<u>WAC 296-307-70450</u>
<u>Provide rescue and medical assistance.</u>	<u>WAC 296-307-70455</u>
<u>Personal protective equipment.</u>	<u>WAC 296-307-70460</u>
<u>Control hazards created by personal protective equipment (PPE).</u>	<u>WAC 296-307-70465</u>

<u>The employer must meet the requirements...</u>	<u>in this section:</u>
<u>Use personal protective equipment (PPE) properly.</u>	<u>WAC 296-307-70470</u>
<u>Postemergency response.</u>	<u>WAC 296-307-70475</u>
<u>Definitions.</u>	<u>WAC 296-307-70480</u>

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-70410 Planning. Develop an emergency response plan.

Notes: ((*)~~(You)~~) 1. The employer may already have an emergency response plan, such as required by chapter 296-843 WAC, Hazardous waste operations or by state and locally coordinated response efforts (Section 303 of Superfund Amendments and Reauthorization Act (SARA), Title III). ((You)) The employer may use those plans to comply with this section, if they include the items listed below.
 ((*) 2. Before a written emergency response plan can be developed, ((you)) the employer will need to anticipate the types of uncontrolled releases that employees could encounter in ((your)) the workplace(s).

((You must:))

(1) The employer must make sure ((your)) its plan is written and adequately addresses, as a minimum, all of the following:

((*) (a) Preemergency planning and coordination with additional responders (including personnel from other employers such as: Fire departments, law enforcement agencies, emergency medical services, and state or federal agencies).

((*) (b) Personnel roles, (see Table 1) and lines of authority and communications for all affected parties including responders.

((*) (c) Employee training (see WAC 296-307-70415, train ((your)) employees), for more detail:

Notes: ((*) 1. Responders' level of training depends on the duties and roles the employer assigns.
 ((*) 2. Training for the employees' role should address the competencies specified in Tables 3 through 6.
 ((*) 3. Training on specific substances may be appropriate depending on the number and characteristics of hazardous substances expected to be encountered. For example, if employees may only respond to one substance, ((you)) the employer could provide training (covering the knowledge and skills specified in Tables 3 through 6) relevant to that single substance. If employees might respond to a range of hazardous substances, training may be required to cover categories of hazardous substances.

((You must:))

*) (d) Videos and automated training methods (for example: Interactive computer based programs) may be used in training; however, instructors must be readily available to:

- ((-) (i) Encourage and provide responses to questions for the benefit of the group;
- ((-) (ii) Evaluate employees' understanding of the material;
- ((-) (iii) Provide instructional interaction to the group.

- ((*) (e) Emergency recognition;
- ((*) (f) Immediate emergency procedures including:
- ((-) (i) Methods of alerting employees (see WAC 296-307-345, Employee alarm systems) and outside responders;
- ((-) (ii) Procedures for limited action (emergency prevention).

Note: *Limited action* includes shutting down processes, closing emergency valves and other critical actions to secure the operation, or prevent the incident from increasing in severity.

Limited Action and Employee Roles	
If . . .	Then employees involved would be:
Limited action could be conducted in the danger area	Considered emergency responders
Limited action will not be conducted in IDLH conditions	Considered evacuees, not emergency responders

((*) (g) Details of who will evacuate immediately and who will remain behind for limited action;

((*) (h) Evacuation routes and procedures;

((*) (i) How to establish safe distances and places of refuge (for example, during emergency response the incident commander (IC) decides to make changes based on new developments, i.e., changes in the wind direction).

((You must:))

*) (j) Methods of securing and controlling access to the site;

((*) (k) Emergency medical treatment and first aid;

((*) (l) A complete personal protective equipment (PPE) program that addresses:

((-) (i) Selection of PPE including selection criteria to be used and the identification, specified use and limitations of the PPE selected;

((-) (ii) Training on proper use of PPE (including maintenance);

((-) (iii) Hazards created by wearing PPE including heat stress during temperature extremes, and/or other appropriate medical considerations;

((-) (iv) Criteria used for determining the proper fit of PPE;

((-) (v) Procedures covering proper use of PPE including procedures for inspection, putting it on (donning) and removing it (doffing);

((-) (vi) Maintenance of PPE including procedures for decontamination, disposal and storage;

((-) (vii) Methods used to evaluate the effectiveness of your PPE program((-));

Notes: ((*) 1. If a manufacturer's printed information or WISHA rule adequately addresses procedural requirements (such as donning or doffing for PPE), it is not necessary to rewrite this into your program; simply attach the printed information.

((*)~~(You)~~) 2. The employer may use written procedures provided by the equipment manufacturer when they meet the requirements of other chapters, including chapter 296-307 WAC, Part Y-5, Respirators.

((-) (viii) Emergency equipment;

- (-) (ix) Emergency response procedures;
 - (-) (x) Decontamination procedures determined by a hazardous materials specialist or other qualified individual;
 - (-) (xi) Methods to critically assess the response and conduct appropriate follow-up.
- (You must:)**
- (2) The employer must make (~~you~~) its written emergency response plan available to employees, their representatives, and WISHA personnel for inspecting or copying.

Note: In situations where multiple employers could respond to an incident, all plans should consistently address:

(*) 1. Who will be designated as the incident commander (IC);

AND

(*) 2. If, when, and how transfer of the incident commander (IC) position will take place.

Table 1 Roles and Duties of Emergency Responders	
If the employee's role is:	Then all the following apply. They:
First responder at the awareness level	<ul style="list-style-type: none"> • Are likely to witness or discover a hazardous substance release • Are trained to initiate an emergency response by notifying the proper authorities of the release • Take no further action beyond notifying the authorities
First responder at the operations level	<ul style="list-style-type: none"> • Respond to actual or potential releases in order to protect nearby persons, property, and/or the environment from the effects of the release • Are trained to respond defensively, without trying to stop the release • May try to: <ul style="list-style-type: none"> - Confine the release from a safe distance - Keep it from spreading - Protect others from hazardous exposures
Hazardous materials technician	<ul style="list-style-type: none"> • Respond to releases or potential releases, with the intent of stopping the release • Are trained to approach the point of release offensively in order to, either: <ul style="list-style-type: none"> - Plug - Patch - Stop the release using other methods
Hazardous materials specialist	<ul style="list-style-type: none"> • Respond along with, and provide support to, hazardous materials technicians • Are required to have more specific knowledge of hazardous substances than a hazardous materials technician • Act as the site activity liaison when federal, state, local, and other government authorities participate
Incident commander	<ul style="list-style-type: none"> • Have ultimate responsibility for: <ul style="list-style-type: none"> - Direction - Control - Coordination of the response effort - Will assume control of the incident beyond the first responder awareness level
Specialist employee	<ul style="list-style-type: none"> • Are a technical, medical, environmental, or other type of expert • May represent a hazardous substance manufacturer, shipper, or a government agency • May be present at the scene or may assist from an offsite location • Regularly work with specific hazardous substances • Are trained in the hazards of specific substances • Are expected to give technical advice or assistance to the incident commander or incident safety officer, when requested
Skilled support personnel	<ul style="list-style-type: none"> • Are needed to perform an immediate, specific emergency support task at the site

Table 1 Roles and Duties of Emergency Responders	
If the employee's role is:	Then all the following apply. They:
	<ul style="list-style-type: none"> • Are skilled in the operation of equipment including: <ul style="list-style-type: none"> - Earth moving equipment - Cranes - Hoisting equipment
Incident safety officer	<ul style="list-style-type: none"> • Are designated by the incident commander • Are knowledgeable in operations being implemented at the site • Have specific responsibility to <ul style="list-style-type: none"> - Identify and evaluate hazards - Provide direction on employee safety matters

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-70415 Training.

Train ~~(you)~~ employees.

Notes: ((*) 1. Use Tables 3 through 6 to identify ~~(you)~~ employees' training competencies.
~~(You)~~ 2. The employer may conduct training internally, or use outside training services to comply with this section.
 (-) When outside trainers are hired, ~~(you are)~~ the employer is still responsible for making sure the requirements of this section are met. For example, employers may compare the course outline to the competencies listed in Tables 3 through 6.

~~(You must:~~

***) (1) The employer must make** sure employees are appropriately trained for their assigned roles and duties as follows:

Exemption: Skilled support employees are not covered by the training requirements of this section (see WAC 296-307-70440).

(2) The employer must provide initial training:

(*) (a) Provide initial training before the employee is allowed to participate in an actual emergency response operation.

Note: When first responders at the awareness or operations level have sufficient experience to objectively demonstrate competencies specified in Table 3, you may accept experience instead of training.

(*) (b) Make sure initial training adequately addresses the competencies in Tables 3 through 6 and the minimum training durations in Table 2.

(*) (c) Certify that employees objectively demonstrate competencies specified in Tables 3 through 6 (except for employees trained as first responders at the awareness level).

~~(You must:~~

(3) The employer must provide retraining (refresher) training:

(*) (a) Provide retraining annually.

(*) (b) Make sure retraining covers necessary content.

(*) (c) Document training or demonstrated competency.

Note: Retraining is not required when employees demonstrate competencies annually and a record is kept of the demonstration methodology used.

~~(You must:~~

(4) For trainer qualifications, the employer must:

(*) (a) Verify trainers have satisfactorily completed an instructors' training course for the subjects they teach. For example, courses offered by the United States National Academy, or equivalent courses are acceptable.

OR

(*) (b) Have the educational and instructional experience necessary for training.

(5) For specialist employees, the employer must:

(*) Specialist employees who have been sent to the scene to advise or assist must receive training or demonstrate competency in their specialty, annually.

Table 2 Minimum Training Durations for all Responders	
If you are a:	Then:
First responder at the awareness level	Training duration needs to be sufficient to provide the required competencies
First responder at the operations level	You need a minimum of 8 hours training (see Table 3)
Hazardous materials technician	You need a minimum of 24 hours training (see Table 4)
Hazardous materials specialist	You need a minimum of 24 hours training (see Table 4)
Incident commander	You need a minimum of 24 hours training (see Table 5)

Table 3
Competencies for First Responders at the Awareness Level and Operations Level

Employees must be able to show they:	When they are designated as First Responders at the:	
	Awareness Level	Operations Level
Understand what hazardous substances are and their associated risks.	X	X
Recognize the presence of hazardous substances in an emergency.	X	X
Can identify the hazardous substances, when possible.	X	X
Understand the potential consequences of hazardous substances in an emergency.	X	X
Understand the role of a first responder at the awareness level as described in: <ul style="list-style-type: none"> • The employer's emergency response plan, including site security and control. • The United States Department of Transportation's Emergency Response Guidebook. (<i>Search at: http://www.dot.gov</i>) 	X	X
Can use The United States Department of Transportation's Emergency Response Guidebook.	X	X
Recognize the need for additional resources and the need to notify the incident's communication center accordingly.	X	X
Know basic hazard and risk assessment techniques.		X
Can select and use personal protective equipment (PPE) appropriate for first responder operations level.		X
Understand basic hazardous materials terms.		X
Can perform basic control, containment, and/or confinement operations within the capabilities of the resources and PPE available.		X
Can implement decontamination procedures to their level of training.		X
Understand relevant standard operating and termination procedures.		X

Table 4
Competencies for Hazardous Materials Technicians and Hazardous Materials Specialist

Employees must be able to show they:	When they are designated as a Hazardous Materials:	
	Technician	Specialist
Have the competencies specified for the first responder operations level. (See Table 3)	X	X
Can implement an employer's emergency response plan.	X	X
Can function within their assigned role in the incident command system.	X	X
Understand hazard and risk assessment techniques.	X	X
Understand basic chemical and toxicological terminology and behavior.	X	X
Can use field survey instruments and equipment to classify, identify, and verify materials at the incident.	X	X
Can select and use personal protective equipment (PPE) appropriate for hazardous materials technicians.	X	X
Can perform advance control, containment, and/or confinement operations within the capabilities of the resources and PPE available.	X	X
Can implement decontamination procedures to their level of training.	X	X
Understand termination procedures.	X	X

Table 4 Competencies for Hazardous Materials Technicians and Hazardous Materials Specialist		
Employees must be able to show they:	When they are designated as a Hazardous Materials:	
	Technician	Specialist
Can implement the local emergency response plan.		X
Know of the state emergency response plan.		X
Can develop a site safety and control plan.		X
Understand chemical, radiological, and toxicological terminology and behavior.		X
Understand in-depth hazard and risk techniques.		X
Can use advanced survey instruments and equipment to classify, identify and verify materials at the incident.		X
Can select and use proper specialized chemical PPE given to hazardous materials specialists.		X
Can perform specialized control, containment, and/or confinement operations within the capabilities of the resources and PPE available.		X
Can determine decontamination procedures.		X

Table 5 Competencies for Incident Commanders	
Employees designated as Incident Commanders must be able to show they:	
• Have competencies specified for the First Responder Operations Level. (See Table 3.)	
• Know of the state emergency response plan and the Federal Regional Response Team.	
• Can implement the local emergency response plan.	
• Can implement the employer's emergency response plan.	
• Have knowledge of the incident command system (ICS) and understand how they relate to it.	
• Can implement the employer's ICS.	
• Understand the hazards and risks associated with employees working in chemical protective clothing.	
• Understand the importance of decontamination procedures.	
Note: If the first employee arriving at the scene is not trained as an IC, they may take control of the incident within their designated role and training level.	

Table 6 Competencies for Specialist Employees	
Employees designated as Specialist Employees must be able to show they:	
• Have current knowledge in their field regarding safety and health practices relating to the specific hazardous substances.	
• Have the knowledge of the ICS and understand how they relate to it.	
• Understand the care and use of personal protective equipment (PPE).	

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-70420 Medical surveillance. Provide medical surveillance to employees.

~~((You must:))~~

(1) The employer must provide medical surveillance for employees to comply with Tables 7 and 8, and the following:

((*) (a) Make medical surveillance available at:

((-) (i) Reasonable times and places.

((-) (ii) No cost to employees, including travel associated costs such as mileage, gas or bus fare if the employee is required to travel off site.

AND

((-) (iii) Wages for additional time spent outside of employees' normal work hours.

((*) (b) Make sure a licensed physician performs or supervises exams and procedures.

((*) (c) Give complete information to the examining physician including:

((-) (i) A copy of this section.

((-) (ii) A description of the employee's duties that relate to hazardous substance exposure.

((-) (iii) The hazardous substance exposure levels anticipated for the employee.

((-) (iv) A description of the personal protective equipment (PPE) the employee could use.

((-) (v) Information available from previous medical examinations.

((-) (vi) The medical evaluation information required by chapter 296-307 WAC, Part Y-5, Respirators.

((*) (d) Medical exams must include, at a minimum:

((-) (i) A medical history.

((-) (ii) A work history (or updated history if on file).

((-) (iii) A special emphasis on:

((*) (A) Assessment of symptoms related to handling hazardous substances.

((*) (B) Health hazards.

((*) (C) Evaluation of fitness for duty (including the ability to wear any personal protective equipment (PPE) or other conditions that may be expected at the workplace).

((-) (iv) Other content as determined by the examining physician.

Note: The physician should consult the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* and the *Medical Management Guidelines for Acute Chemical Exposure* (search OSHA website: <http://www.osha.gov>).

~~((You must))~~

(2) The employer must obtain the physician's written opinion and give a copy to the employee that includes:

((*) (a) A statement of whether or not medical conditions were found which would increase the employee's risk for impairment during emergency response work or respirator use.

((-) Do not include specific findings or diagnoses unrelated to occupational exposures.

((*) (b) Limitations recommended to the employee's assigned work, if any.

((*) (c) Exam and test results if the employee requests this information.

((*) (d) A statement that affirms the employee has been confidentially informed of medical exam results (including medical conditions requiring follow-up).

Table 7 Medical Surveillance for Employee Categories	
If the employee is covered by this section and is:	Then you must:
<ul style="list-style-type: none"> • Exposed for at least 30 days a year to health hazards or hazardous substances at or above the permissible exposure limit or published exposure levels (even when respirators are used), OR • Required to wear a respirator for at least 30 days a year.* 	<ul style="list-style-type: none"> • Offer standard medical surveillance as specified in Table 8.*
<ul style="list-style-type: none"> • A hazardous materials (HAZMAT) team member. • A hazardous materials specialist. 	<ul style="list-style-type: none"> • Provide standard medical surveillance as specified in Table 8.
<ul style="list-style-type: none"> • An emergency responder who shows immediate or delayed signs or symptoms possibly resulting from exposure to hazardous substances during an incident. 	<ul style="list-style-type: none"> • Provide incident-specific medical surveillance as specified in Table 8.
<ul style="list-style-type: none"> • Not an emergency responder and: <ul style="list-style-type: none"> - May be injured. - Shows immediate or delayed signs or symptoms possibly resulting from exposure to hazardous substances. - May have been exposed to hazardous substances at concentrations above the permissible exposure limits (PELs) or the published exposure levels without appropriate PPE. 	<ul style="list-style-type: none"> • Offer incident-specific medical surveillance as specified in Table 8.

*Note: A medical evaluation for respirator use is required by chapter 296-307 WAC, Part Y-5, Respiratory protection, for those employees who have not been cleared for respirator use during medical surveillance activities.

Table 8 Frequency of Exams and Consultations	
If the employee is covered by:	Then medical surveillance must include:
<ul style="list-style-type: none"> • Standard medical surveillance 	<p>Exams and consultations:</p> <ul style="list-style-type: none"> • Before assignment. <p>Note: If the employee is a hazardous materials (HAZMAT) team member or a hazardous materials specialist, the employee must receive a baseline physical examination.</p> <ul style="list-style-type: none"> • At least once every 12 months after their initial assignment unless the physician believes a shorter, or longer interval (but no more than 24 months) is appropriate. • Whenever employees are reassigned to an area where they will no longer be covered by medical surveillance and they have not been examined within the past 6 months. • As soon as possible after an employee reports: <ul style="list-style-type: none"> - Signs or symptoms of possible overexposure to hazardous substances or health hazards. - Injury. - Exposure above the permissible exposure limits or published exposure levels. • At the termination of their employment unless they were examined within the past 6 months.
<ul style="list-style-type: none"> • Incident-specific medical surveillance 	<p>Medical consultations and exams:</p> <ul style="list-style-type: none"> • As soon as possible following the incident or development of signs or symptoms. • At additional times, if the physician determines follow-up is medically necessary.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-70425 Keep records.

~~((You must:))~~

•) The employer must keep a record of:

- ((-)) (1) Name and Social Security number of the employee receiving medical surveillance;
- ((-)) (2) Physicians' written opinions, recommended limitations, and results of examinations and tests;
- ((-)) (3) Any employee medical complaints regarding hazardous substance exposures;
- ((-)) (4) A copy of all information given to the examining physician (except a copy of this section).

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-70430 Incident requirements. Recognize emergencies and initiate a response.

~~((You must:))~~

•) The employer must make sure employees follow procedures in your emergency response plan to:

- ((-)) (1) Recognize when an emergency response must be initiated;
- ((-)) (2) Notify employees, and others designated in your plan, of the release;
- ((-)) (3) Follow immediate emergency procedures;
- ((-)) (4) Prevent the incident from increasing in severity or to secure the operation.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-70435 Implement and maintain an incident command system (ICS).

~~((You must:))~~

(1) The employer must make sure a single individual, acting as the incident commander (IC), is in charge of the site-specific incident command system (ICS) and acts within their designated role and training level.

Note: ((*) For multiemployer worksites:

- ((-)) 1. The IC has responsibility for controlling emergency response operations at the site for all employers.
- ((-)) 2. Emergency response plans should be consistent in designating who assumes the IC position.
- ((■)) 3. If the first employee arriving at the scene is not trained as an IC (see Table 5, Training Requirements for Incident Commanders and Specialist Employees, WAC 296-307-70415), they may take control of the incident within their designated role and training level.

~~((You must:))~~

(2) The employer must make sure all employers' emergency responders and their communications are coordinated and controlled by the IC.

Note: The IC may delegate tasks to subordinates (within their training level).

~~((You must:))~~

(3) The employer must make sure each employer at the scene has designated a representative to assist the IC.

(4) The employer must establish security and control of the site as specified in your written emergency response plan.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-70440 Prepare skilled support personnel.

Note: The duties of skilled support personnel are described in Table 1, Roles and Duties of Emergency Responders.

~~((You must:))~~

(1) The employer must make sure that ~~((you))~~ their skilled support personnel (including those employees who are not regularly employed by you) who could be exposed to on-scene hazards are given an initial briefing at the site before they participate in any emergency response. The initial briefing must include:

(*) (a) What chemical hazards are involved;

(*) (b) What duties are to be performed;

(*) (c) Instruction in the wearing of appropriate personal protective equipment.

Note: Skilled support personnel do not need to comply with the other training requirements of this section.

~~((You must:))~~

(2) The employer must make sure the safety and health precautions given to your employees are also given to skilled support personnel.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-70445 Make sure the incident commander oversees activities during the response. The employer of the incident commander (IC) must:

(1) Identify all hazardous substances and conditions present, within their training level, using site analysis and maximum exposure limits, when appropriate.

(2) Implement emergency response procedures appropriate to the hazardous substances and conditions present, such as:

(*) (a) Procedures that address the use of engineering controls, hazardous substance handling, and new technologies;

(*) (b) Procedures that address decontamination;

(*) (c) Procedures that address PPE;

(*) (d) Procedures that limit the number of personnel to those who are actively performing emergency response operations, in areas where exposure could exist.

(3) Designate an incident safety officer (ISO).

(*) Make sure the ISO demonstrates knowledge about operations being implemented at the emergency response site. They must:

(-) (a) Identify and evaluate hazards;

(-) (b) Communicate with the IC about hazards, immediately informing the IC of corrective actions that must be taken when conditions are judged to be:

(■) (i) An imminent danger;

OR

(■) (ii) Immediately dangerous to life or health (IDLH).

(-) (c) Provide direction about the safety of operations.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-70450 Use the buddy system in danger areas.

~~((You must:))~~

*) The employer must make sure operations and tasks (including limited actions) in danger areas are conducted using the buddy system in teams of two or more.

Definition(*) Danger areas are areas where conditions pose a serious danger to employees, such as areas where:

(*) (a) Immediately dangerous to life or health (IDLH) conditions could exist.

OR

(*) (b) High levels of exposure to toxic substances could exist.

OR

(*) (c) There is a potential for exceeding the lower explosive limit (LEL), also known as the lower flammability limit (LFL) of a hazardous substance.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-70455 Provide rescue and medical assistance.

~~((You must:))~~

(1) The employer must provide stand-by employees equipped with the same level of personal protective equipment (PPE) as the entrants, for assistance or rescue.

Notes: (*) 1. The buddy system applies to stand-by employees (WAC 296-307-70450).

(*) 2. One of the two stand-by employees can be assigned to another task provided it does not interfere with the performance of the stand-by role.

(*) 3. Rescue equipment should be selected and provided based on the types of rescue situations that could occur.

~~((You must:))~~

(2) The employer must make sure employees trained in first aid are readily available with necessary medical equipment and have a way to transport the injured.

Note: (*) Employers who require their employees to provide first aid must comply with the bloodborne pathogen rule, chapter 296-823 WAC.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-70460 Personal protective equipment.

Notes: (*) 1. Only properly trained employees should select PPE. Hazardous materials technicians and hazardous materials specialists can select PPE within the competencies specified in Table 4.

(*) 2. Selection requirements in other PPE rules also apply, including:

(-) a. Chapter 296-307 WAC, Part Y-5, Respirators.

(-) b. Chapter 296-305 WAC, Safety standards for firefighting.

~~((You must:))~~

*) (1) The employer must provide employees with appropriate PPE and make sure it is used if hazards could be present.

(*) (2) The employer must select PPE (such as respirators, gloves, protective suits and other PPE) based on:

(-) (a) An evaluation of the performance characteristics (such as breakthrough time and hazardous substance-speci-

ficiency of the material or item) relevant to the requirements and limitations of the site.

((-) (b) Task-specific conditions and durations.

((-) (c) The hazards and potential hazards of the site (see Table 9, Selecting PPE for Specific Hazards).

((*) (3) The employer must select totally encapsulating chemical protective (TECP) suits, as specified in Table 9, that:

((-) (a) Maintain positive air pressure.

((-) (b) Prevent inward test gas leakage of more than 0.5 percent.

Note: Follow the manufacturer's recommended procedure for testing a TECP suit's ability to maintain positive air pressure and prevent inward gas leakage. Other established test protocols for these suits, for example NFPA 1991 and ASTM F1052-97, may also be used.

Table 9 Selecting PPE for Specific Hazards	
If:	Then use:
• Inhalation hazards could be present.	• Positive-pressure (pressure-demand) self-contained breathing apparatus (SCBA) OR • A decreased level of respiratory protection only when the incident commander determines, from air monitoring results, that employees will be adequately protected.
Chemical exposure levels will create a substantial possibility of: <ul style="list-style-type: none"> • Immediate death. • Immediate serious illness or injury. • Reduced ability to escape. 	Either positive-pressure (pressure-demand): <ul style="list-style-type: none"> • SCBA • Air-line respirators equipped with an escape air supply.
Skin absorption of a hazardous substance may result in a substantial possibility of: <ul style="list-style-type: none"> • Immediate death. • Immediate serious illness or injury. • Reduced ability to escape. 	Protection equivalent to Level A including a totally encapsulating chemical protective (TECP) suit.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-70465 Control hazards created by personal protective equipment (PPE).

~~((You must:))~~

((*) The employer must control hazards created by the use of PPE, including:

((-) (1) Heat stress due to extremely high temperatures.

((-) (2) Any other employee health hazard and consideration.

((*) (b) You need a supplemental air supply;

((*) (c) The cylinders are of the same capacity and pressure rating.

(4) The employer must make sure compressed air cylinders used with SCBAs meet the testing and service life requirements of the United States Department of Transportation (USDOT). Search at: <http://www.dot.gov>.

Note: You can also check with the cylinder manufacturers to obtain USDOT test and service life specifications.

~~((You must:))~~

(5) The employer must make sure PPE is maintained in a safe and reliable condition using your plan's procedures. PPE maintenance includes:

((*) (a) Decontamination;

((*) (b) Cleaning;

((*) (c) Inspection;

((*) (d) Identification of damage or defects;

((*) (e) Parts repair or replacement;

((*) (f) Storage or disposal.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-70470 Use personal protective equipment (PPE) properly.

~~((You must:))~~

(1) The employer must make sure employees inspect PPE before, during and after use, following your plan's procedures.

(2) The employer must make sure employees put on (don) and remove (doff) PPE following your plan's procedures.

(3) The employer must make sure employees do not interchange self-contained breathing apparatus (SCBA) air cylinders from different manufacturers, unless all of the following apply:

((*) (a) There is a life-saving emergency;

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-70475 Postemergency response.

IMPORTANT:

Postemergency response is the stage of the emergency response where the immediate threat from the release has

been stabilized or eliminated, and cleanup of the site has started.

When cleanup is done by the employees who were part of the initial emergency response, the employees are not covered by this section (however, training, PPE and other requirements in WAC 296-307-70460 through 296-307-70470 apply to these employees).

~~((You must))~~

(1) The employer must follow Table 10 to determine which requirements apply to ~~((your))~~ postemergency response activities.

(2) The employer must maintain clean-up equipment as specified in Table 10.

Table 10 Rules that Apply to Postemergency Response Activities	
When postemergency response cleanup is performed by employees who were not part of the initial emergency response and:	The following rules or requirements apply:
It is necessary to remove hazardous substances, health hazards and contaminated materials (example: Soil) from the site.	Chapter 296-843 WAC, Hazardous waste operations.
Cleanup is done on plant property using plant or workplace employees AND It is not necessary to remove hazardous substances, health hazards and contaminated materials from the site.	For training: <ul style="list-style-type: none"> • WAC 296-307-35015 and 296-307-35018, Employee emergency action plans • Chapter 296-307 WAC, Part Y-5, Respiratory protection • WAC 296-307-550, Employer chemical hazard communication • Other appropriate training requirements relevant to personal protective equipment (PPE) and decontamination For equipment: <ul style="list-style-type: none"> • Make sure that all equipment used for clean-up work is serviced and inspected before use.

AMENDATORY SECTION (Amending WSR 05-01-166, filed 12/21/04, effective 4/2/05)

WAC 296-307-70480 Definitions. The following definitions are specific to this section:

Annually. Any twelve-month cycle.

Buddy system. A system of organizing employees (who enter or stand by danger areas) into work groups, so each employee can be observed by at least one other member of the group. The purpose of this system is to provide rapid assistance to employees in an emergency.

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

Danger area. Areas where conditions pose a serious danger to employees, such as areas where:

((★)) (a) Immediately dangerous to life or health (IDLH) conditions could exist;

OR

((★)) (b) High levels of exposure to toxic substances could exist;

OR

((★)) (c) There is a potential for exceeding the lower explosive limit (LEL), also known as the lower flammability limit (LFL), of a substance.

Decontamination. Removing hazardous substances from employees and their equipment so potential adverse health effects will not occur.

Emergency response. An organized response to an anticipated release of a hazardous substance that is, or could become, an uncontrolled release.

Emergency response plan. A written plan that requires coordination between emergency response participants, and contains procedures, criteria, and other information that will be applied to emergency response operations. Each employer's plan should be compatible with local and state plans.

Engineering controls. Methods of controlling employee exposures by modifying the source or reducing the quantity of contaminants.

Hazardous materials team (HAZMAT team). A group of employees who are expected to perform responses to releases, or possible releases, of hazardous substances for the purpose of control and stabilization. As a result of their duties, HAZMAT team members may have close contact with hazardous substances.

Note: A HAZMAT team may be a separate component of a fire brigade or fire department.

Hazardous substance. Any of the following substances that could adversely affect an exposed employee's health or safety:

((★)) (a) Substances defined under section 101(14) of the Comprehensive Environmental Response, Compensation and

Liability Act of 1980 (CERCLA) or "Superfund" Act (visit: (<http://www.epa.gov>)) (<https://www.epa.gov>)

((*) (b) Biological or other disease-causing agents released that could reasonably be expected to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations in a person or their offspring when the person:

((-) (i) Is directly exposed to the agent in the environment;

((-) (ii) Directly ingests, inhales, or assimilates the agent from the environment;

((-) (iii) Indirectly ingests the agent through a food chain;

((*) (c) Substances listed by the United States Department of Transportation as hazardous materials under Title 49 (Transportation) in the Code of Federal Regulations (C.F.R.), Part 172, section 101 and appendices (visit: <http://www.nara.gov> and search for "List of C.F.R. subjects");

((*) (d) Hazardous wastes as defined in this section.

Hazardous waste. A substance designated by chapter 173-303 WAC, Dangerous waste regulations, department of ecology, as a dangerous waste or an extremely hazardous waste and any waste fitting the definition of "health hazard" in this section.

Note: For department of ecology regulations, visit: <http://www.ecy.wa.gov>.

Health hazard. A chemical, a mixture of chemicals, or a pathogen for which there is statistically significant evidence, based on at least one study conducted according to established scientific principles, that acute or chronic health effects may occur in exposed employees.

The term "health hazard" includes stress due to temperature extremes and chemicals that are:

((*) (a) Carcinogens;

((*) (b) Toxic or highly toxic agents;

((*) (c) Reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, or neurotoxins;

((*) (d) Agents acting on the hematopoietic system agents that damage lungs, skin, eyes, or mucous membranes. (Detailed definitions of these chemical terms can be found in the Safety and health core rules, WAC 296-307-550, chemical hazard communication.)

Immediately dangerous to life or health (IDLH). Any atmospheric condition that would:

((*) (a) Cause an immediate threat to life;

OR

((*) (b) Cause permanent or delayed adverse health effects;

OR

((*) (c) Interfere with an employee's ability to escape.

Incident command system (ICS). An organized approach to control and manage operations at an emergency response incident.

Incidental release. A release that can be safely controlled at the time of the release and does not have the potential to become an uncontrolled release.

Note: Example of a situation that results in an incidental release:

A tanker truck is receiving a load of hazardous liquid when a leak occurs. The driver knows the only hazard from the liquid is minor skin irritation. The employer has trained the driver on procedures and provided equipment to use for a release of this quantity. The driver puts on skin protection and stops the leak. A spill kit is used to contain, absorb, and pick up the spilled material for disposal.

Limited action. Action necessary to:

((*) (a) Secure an operation during emergency responses;

OR

((*) (b) Prevent an incident from increasing in severity.

Examples include shutting down processes and closing emergency valves.

Lines of authority. A preestablished ranking of individuals, qualified to assume a commanding role during an emergency response, noted in an emergency response plan and implemented during a response. This is most important when responders from multiple employers could participate in an emergency response.

Lower explosive limit (LEL). See lower flammable limit (LFL).

Lower flammable limit (LFL). The lowest concentration of a material that will propagate a flame. The LFL is usually expressed as a percent (by volume) of the material in air (or other oxidant).

Must. Must means mandatory.

Permissible exposure limit (PEL). Means the established time-weighted-average (TWA) concentration or ceiling concentration of a contaminant that must not be exceeded.

The exposure, inhalation, or dermal permissible limit specified in chapter 296-307 WAC, Part Y-6, Respiratory hazards.

Personal protective equipment (PPE). Protective items designed to be worn by the user to protect them against airborne, skin contact and other hazards. This includes items such as respiratory protection, protective suits, gloves, eye protection, etc.

Postemergency response. The stage of the emergency response where the immediate threat from the release has been stabilized or eliminated, and cleanup of the site has started.

Published exposure level. Exposure limits published in "National Institute for Occupational Safety and Health (NIOSH) Recommendations for Occupational Safety and Health" (DHHS publication #92-100, 1992).

If an exposure limit is not published by NIOSH, then "published exposure level" means the exposure limits published by the American Conference of Governmental Industrial Hygienists (ACGIH) in "TLVs and BEIs-Threshold Limit Values for Chemical Substances and Physical Agents" (1999 edition).

Note: Additional exposure levels published by recognized organizations such as the American Industrial Hygiene Association are not required to be observed by this rule; however, they may be a useful resource when a hazardous substance is not covered by NIOSH and ACGIH publications.

Release. A spill, leak, or other type of hazardous substance discharge.

Uncontrolled release. A release where significant safety and health risks could be created. Releases of hazardous substances that are either incidental or could not create a safety or health hazard (i.e., fire, explosion or chemical exposure) are not considered to be uncontrolled releases.

(a) Examples of conditions that could create a significant safety and health risk:

(i) Large-quantity releases;

(ii) Small releases that could be highly toxic;

(iii) Airborne exposures that could exceed a WISHA permissible exposure limit or a published exposure limit and employees are not adequately trained or equipped to control the release.

(b) Example of an uncontrolled release:

A forklift driver knocks over a container of a solvent-based liquid, releasing the contents onto the warehouse floor. The driver has been trained to recognize the vapor is flammable and moderately toxic when inhaled. The driver has not been trained or provided appropriate equipment to address this type of spill. In this situation, it is not safe for the driver to attempt a response. The driver needs to notify someone of the release so an emergency response can be initiated.

Workplace.

(*) (a) A fixed facility;

OR

(*) (b) A temporary location (such as a traffic corridor);

OR

(*) (c) Locations where employees respond to emergencies.