

filed 12/8/82. Statutory Authority: Chapter 43.99 RCW. 79-09-124 (Order 79-1), § 286-16-035, filed 9/5/79.]

(Resolution No. 84-52), § 289-15-225, filed 12/12/84. Statutory Authority: RCW 70.48.050 (1)(c). 84-16-041 (Order 84-01), § 289-15-225, filed 7/27/84. Statutory Authority: RCW 70.48.050 (1)(a) and 70.48.070(4). 83-20-092 (Order 34), § 289-15-225, filed 10/5/83; 83-04-004 (Order 32), § 289-15-225, filed 1/21/83; 82-11-070 (Order 28), § 289-15-225, filed 5/17/82.]

Title 289 WAC
CORRECTIONS STANDARDS BOARD
(Formerly: Jail Commission)

Chapter
289-15 Custodial care standards--Safety.

Chapter 289-15 WAC
CUSTODIAL CARE STANDARDS--SAFETY

WAC
289-15-225 Maximum capacities.

WAC 289-15-225 Maximum capacities. Pursuant to WAC 289-15-220, the maximum capacity of each detention and correctional facility within the state of Washington is established at the figure indicated below.

Detention Facilities	Correctional Facilities
Auburn (22)	Asotin County (16)
Bremerton (23)	Benton County (109)
Issaquah (10)	Chelan County (132)
Olympia (temporary) (19)	Clallam County (102)
Stevens County (22)	Clark County (335)
	Cowlitz County (149)
	Ferry County (22)
	Forks (11)
	Franklin County (76)
	Grant County (85)
	Grays Harbor County (82)
	Island County (50)
	Jefferson County (20)
	Kent (56)
	King County (784)
	Kitsap County (103)
	Kitsap County Work Release (42)
	Kittitas County (45)
	Klickitat County (30)
	Lewis County (68)
	Lincoln County (15)
	Mason County (45)
	Okanogan County (67)
	Pacific County (29)
	Pend Oreille County (18)
	Pierce County (470)
	Skagit County (83)
	Skamania County (17)
	Snohomish County(277)
	Snohomish County Work Release (60)
	Spokane County(461)
	Thurston County(145)
	Walla Walla County (44)
	Whatcom County (148)
	Whitman County (34)
	Yakima County (274)

[Statutory Authority: RCW 70.48.050 (1)(c) and 70.48.070. 87-17-022 (Order 87-2), § 289-15-225, filed 8/12/87. Statutory Authority: RCW 70.48.050 (1)(a) and 70.48.070. 87-05-040 (Order 87-1), § 289-15-225, filed 2/18/87; 86-19-015 (Order 86-06), § 289-15-225, filed 9/9/86; 86-09-070 (Resolution No. 86-05), § 289-15-225, filed 4/18/86; 86-02-021 (Order 86-04), § 289-15-225, filed 12/24/85; 85-14-086 (Order 85-03), § 289-15-225, filed 7/1/85; 85-05-001 (Resolution No. 85-01), § 289-15-225, filed 2/7/85; 85-01-034

Title 296 WAC
LABOR AND INDUSTRIES,
DEPARTMENT OF

Chapters	
296-08	Practice and procedure.
296-13	Practice and procedure--Electrical board.
296-14	Industrial insurance.
296-15	Workers' compensation self-insurance rules and regulations.
296-16	Employer--Worker reemployment incentives.
296-17	Manual of rules, classifications, rates, and rating system for Washington workers' compensation insurance.
296-18A	Rehabilitation review.
296-20	Medical aid rules.
296-21	Medical fees.
296-22	Surgical fees.
296-23	Radiology, radiation therapy, nuclear medicine, pathology, hospital, chiropractic, physical therapy, drugless therapeutics, nursing, and vocational services.
296-23A	Hospitals.
296-24	General safety and health standards.
296-27	Recordkeeping and reporting.
296-45	Safety standards--Electrical workers.
296-46	Safety standards--Installing electric wires and equipment--Administrative rules.
296-52	Safety standards for the possession and handling of explosives.
296-54	Safety standards--Logging operations.
296-56	Safety standards--Longshore, stevedore and related waterfront operations.
296-59	Safety standards for ski area facilities and operations.
296-62	Occupational health standards--Safety standards for carcinogens.
296-65	Asbestos removal and encapsulation.
296-78	Safety standards for sawmills and wood-working operations.
296-81	Safety rules governing existing elevators, dumbwaiters, escalators and other lifting devices--Moving walks.
296-99	Safety standards for grain handling facilities.
296-104	Board of boiler rules--Substantive.
296-116	Pilotage rules.
296-127	Prevailing wage.
296-130	Family care.
296-150B	Standards for mobile homes, commercial coaches, and recreational vehicles.
296-155	Safety standards for construction work.

296-200	Contractor certificate of registration renewals--Security--Insurance.
296-304	Safety standards for ship repairing, ship-building and ship-breaking.
296-305	Safety standards for fire fighters.
296-306	Safety standards for agricultural code.
296-350	Reassumption of jurisdiction pursuant to RCW 49.17.140.
296-400	Certification of competency for journeyman plumbers.
296-401	Certification of competency for journeyman electricians.
296-402	Electrical testing laboratory accreditation.
296-403	Amusement rides or structures.

Chapter 296-08 WAC

PRACTICE AND PROCEDURE

WAC

296-08-025 Attorney's fees.

WAC 296-08-025 Attorney's fees. (1) The department of labor and industries (hereinafter department) shall fix a reasonable attorney fee to be paid by the worker, crime victim, or beneficiary for services rendered with the department if written application therefor is made by the attorney, worker, crime victim, or beneficiary, as provided in RCW 51.52.120.

(a) Fees will be set only for services rendered prior to the notice of appeal;

(b) On closed claims, fees will only be set if written application is received by the department within one year from the claim closure date as indicated on the department order.

(c) If such application for fixing of a fee is made by the attorney, it shall set forth therein the monetary amount which the attorney considers reasonable for all services rendered with the department, the reason such fee is considered to be reasonable, and a detailed breakdown of the time spent by the attorney in representing the injured worker.

(d) In all instances, the department shall afford to all parties affected a minimum of ten days in which to submit comment and material information which may be helpful to the department in setting a fair and reasonable fee.

(e) The department will provide copies of information sent to the department to the attorney, worker, crime victim, or beneficiary upon request.

(f) Informal contact may be made with the parties to determine the feasibility of reaching an agreement on the amount of the fees.

(g) Additional information necessary to reach a decision may be requested by the department.

(2) *Fee fixing criteria.* All attorney fees fixed by the department where application therefor has been made shall be established in accordance with the following general principles:

(a) Only one fee shall be fixed for legal services in any one claim regardless of the number of attorneys

representing the worker, crime victim, or beneficiary, except that in cases of multiple beneficiaries represented by one or multiple attorneys the department has the discretion to set more than one attorney fee if so requested.

(b) The department shall defer fixing a fee until such time as information, which it deems sufficient upon which to base a fee, is available.

(c) A fee shall be fixed only in those cases where the attorney's services are instrumental in securing additional benefits to the worker, crime victim, or beneficiary.

(d) Where increased compensation is obtained, the fee may be fixed without regard to any medical benefits secured.

(e) In setting all fees, the following factors shall be carefully considered and weighed:

(i) Nature of the claim.

(ii) Novelty and complexity of the issues presented or other unusual circumstances.

(iii) Time and labor expended.

(iv) Skill and diligence in resolving the claim.

(v) Extent and nature of the relief.

(vi) The prevalent practice of charging contingency fees in the department.

(vii) The worker's or crime victim's circumstance and the remedial social purposes of the Industrial Insurance Act and of the Crime Victims Compensation Act, which are intended to provide sure and adequate relief to injured workers and crime victims and their families.

(3) The manager of the claims consultant division of the department is the director's designee to process all petitions to set attorney's fees and to issue orders setting those fees for services rendered by attorneys in securing industrial insurance benefits. The supervisor of the crime victims section of the department is the director's designee to process all petitions to set attorney's fees and to issue orders setting those fees for services rendered by attorneys in securing crime victims benefits.

[Statutory Authority: RCW 51.52.120, 51.04.020 and 7.68.110. 87-02-037 (Order 86-42), § 296-08-025, filed 1/2/87.]

Chapter 296-13 WAC

PRACTICE AND PROCEDURE--ELECTRICAL BOARD

WAC

296-13-001	Foreword.
296-13-010	Definitions.
296-13-020	Officers.
296-13-035	Dates of meetings.
296-13-040	Duties of the board.
296-13-045	Repealed.
296-13-050	Hearings.
296-13-057	Place and time of filing.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-13-045	Duties of examining board. [Statutory Authority: RCW 19.28.123 and 19.28.590. 84-18-009 (Order 84-16), § 296-13-045, filed 8/27/84.] Repealed by 88-16-002 (Order 88-15), filed 7/21/88. Statutory Authority: RCW 19.28.060.
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WAC 296-13-001 Foreword. (1) The electrical law, chapter 19.28 RCW, establishes the electrical board and fixes their responsibilities. The board's principal functions are: To advise the department in adopting rules with respect to electrical installations and appliances; to act as a board of appeals in contested cases regarding the application or interpretation of installation, alteration or maintenance standards prescribed in the electrical law, chapter 19.28 RCW or chapter 296-46 WAC, Safety standards—Installing electric wires and equipment—Administrative rules; to act as an appeals board in contested cases as provided for in chapter 296-402 WAC, Electrical testing laboratory accreditation; to act as an appeals board in contested cases as provided for in chapter 296-403 WAC, Amusement rides or structures; to establish tests and test procedures for electricians and administrators; and to act as a board of appeals in contested cases that have been heard by the office of administrative hearings regarding the revocation or suspension of an electrical contractor's license or an electrician's or administrator's certificate.

(2) The purpose of this chapter is to provide a uniform procedure for persons, firms, corporations, or other entities to: (a) Communicate with the department about rules that should be adopted, amended, or repealed; (b) appeal a decision of the department revoking or suspending a contractor's license, an electrician's certificate, or an administrator's certificate; (c) appeal a decision of the department suspending, revoking, refusing to renew, or reducing or refusing to renew the product categories for an electrical testing laboratory under chapter 296-402 WAC; and (d) appeal a decision of the department denying or revoking an amusement ride or structure operating permit or ordering the cessation of the operation of an amusement ride or structure, or suspending, revoking, or refusing to issue an amusement ride inspector certificate of competency under chapter 296-403 WAC.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-13-001, filed 7/21/88. Statutory Authority: RCW 19.28.123 and 19.28.590. 84-18-009 (Order 84-16), § 296-13-001, filed 8/27/84; Foreword, filed 10/15/65.]

WAC 296-13-010 Definitions. Whenever used in this chapter, the words:

(1) "Administrative law judge" means an administrative law judge appointed pursuant to chapter 34.12 RCW.

(2) "Board" means the electrical board established pursuant to RCW 19.28.065. The term "board" also includes an administrative law judge or a board member appointed by the board to hear a contested case.

(3) "Chapter" means chapter 296-13 WAC.

(4) "Contested case" means a contested case as defined by RCW 34.04.010(3). It includes appeals from decisions or orders of the department: (a) Revoking or suspending an electrical contractor's license or an administrator's or electrician's certificate; (b) revoking or suspending or refusing to renew an electrical testing laboratory accreditation or product categories; and (c) denying or revoking an amusement ride or structure

operating permit, ordering the cessation of the operation of an amusement ride or structure or suspending, revoking, or refusing to issue an amusement ride inspector certificate of competency. It also includes challenges to the department's interpretation of the installation requirements of chapter 19.28 RCW and chapter 296-46 WAC and appeals of a citation issued by the department for violations of chapter 19.28 or 67.42 RCW, or chapter 296-46, 296-401, 296-402, or 296-403 WAC.

(5) "Department" means the department of labor and industries of the state of Washington.

(6) "Director" means the director of the department.

(7) "Proceeding" means any matter before the board other than a contested case.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-13-010, filed 7/21/88. Statutory Authority: RCW 19.28.123 and 19.28.590. 84-18-009 (Order 84-16), § 296-13-010, filed 8/27/84; Definitions, filed 10/15/65.]

WAC 296-13-020 Officers. In addition to the chairperson, the board shall elect from its members a vice chairperson who shall perform all functions of the chairperson in his or her absence. The department chief electrical inspector serves as secretary to the board.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-13-020, filed 7/21/88. Statutory Authority: RCW 19.28.123 and 19.28.590. 84-18-009 (Order 84-16), § 296-13-020, filed 8/27/84; I, filed 10/15/65.]

WAC 296-13-035 Dates of meetings. (1) The board shall hold regular meetings on the last Thursday of January, April, July, and October of each year.

(2) The director or the chairperson of the board may call a special meeting at any other time.

(3) Each board member and the board secretary shall be notified in writing of the date, time, and place of each regular meeting and special meeting.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-13-035, filed 7/21/88. Statutory Authority: RCW 19.28.123 and 19.28.590. 84-18-009 (Order 84-16), § 296-13-035, filed 8/27/84.]

WAC 296-13-040 Duties of the board. (1) The board shall study proposed rules submitted to it by the department and shall make recommendations concerning their adoption.

(2) The board shall develop and submit for consideration to the department administrative procedures, organizational plans, and rules relating to improving the functions of the electrical section.

(3) The board shall at each meeting consider any written proposals made by any persons, firms, corporations, or other entities for electrical rules or for changes in administrative procedures of the electrical section.

(4) The board shall hear formal appeals in matters under its jurisdiction in contested cases involving a ruling or interpretation by the department of the provisions of chapter 19.28 RCW and chapters 296-46, 296-402, and 296-403 WAC.

(5) The board shall consider proposed expenditures from the electrical fund.

(6) The board shall establish tests and test procedures for journeyman and specialty electricians and for general and specialty administrators.

(7) The board will hear informal appeals in matters under its jurisdiction, including those from persons who desire to contest:

(a) Decisions of the department that they do not qualify to take an examination;

(b) The loss of a certificate because of a failure timely to renew the certificate; and

(c) Grades given on examinations for administrator or electrician certificates.

(8) The board will issue a decision on formal appeals that have been heard by an administrative law judge in contested cases involving an order or decision of the department as provided for in RCW 19.28.350 and WAC 296-401-170 that revokes or suspends an electrical contractor's license, an administrator's certificate, or an electrician's certificate, or lessens the number of hours of work a trainee electrician has accumulated.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-13-040, filed 7/21/88. Statutory Authority: RCW 19.28.123 and 19.28.590. 84-18-009 (Order 84-16), § 296-13-040, filed 8/27/84; § III, filed 10/15/65.]

WAC 296-13-045 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-13-050 Hearings. (1) The board will grant a formal hearing on contested cases. It will grant an informal hearing on all other proceedings that are within its jurisdiction.

(2) A person, firm, corporation, or other entity that desires a formal hearing on a contested case must file a written appeal of the department's decision, order, or interpretation with the secretary of the board. The written appeal must state the decision, order, or interpretation of the department that is being appealed and the relief that is desired. An appeal of a decision or order of the department must be filed within fifteen days of the day the appellant received notice of the department's decision, order, or interpretation.

(3) The board may delegate to an administrative law judge or a board member the responsibility to preside over the hearing and to issue a proposed decision and order. If the board does so, the administrative law judge or a board member shall set the time and place for the hearing. If the board retains the responsibility to preside over the hearing, the board shall set the time and place.

(4) The board shall assign to the office of administrative hearings each appeal of the department's decision, order citation, or interpretation regarding an electrical contractor license, administrator certificate, electrician certificate, or training certificate as provided for in RCW 19.28.350 and 19.28.620, or citation for the sale or exchange of electrical equipment associated with spas, hot tubs, swimming pools, and hydromassage bathtubs that does not bear the product certification mark of an electrical products testing laboratory that has been accredited by the department. The board shall be allowed a minimum of twenty days to review the proposed decision of the administrative law judge and shall issue its

decision and order no later than the next regularly scheduled board meeting.

(5) A person, firm, corporation, or other entity desiring an informal hearing on a proceeding other than a contested case shall file a written request to that effect with the secretary of the board. The written request should describe concisely the matters or proposals on which the informal hearing is requested and the relief that is desired.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-13-050, filed 7/21/88. Statutory Authority: RCW 19.28.123 and 19.28.590. 84-18-009 (Order 84-16), § 296-13-050, filed 8/27/84; § IV, filed 10/15/65.]

WAC 296-13-057 Place and time of filing. A paper that must be filed with the board shall be filed only at the Office of the Chief Electrical Inspector, Electrical Section, 805 Plum Street S.E., P.O. Box 9519, Olympia, WA 98504-9519. The paper may be filed by ordinary mail, certified or registered mail, telegram, or by personal delivery. The date of filing is the date the paper is actually received in the office of the chief electrical inspector.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-13-057, filed 7/21/88. Statutory Authority: RCW 19.28.123 and 19.28.590. 84-18-009 (Order 84-16), § 296-13-057, filed 8/27/84.]

Chapter 296-14 WAC INDUSTRIAL INSURANCE

WAC

296-14-300	Mental condition/mental disabilities.
296-14-350	Claim allowance and wage determination in occupational disease cases.
296-14-400	Reopenings for benefits.
296-14-600	Payment of benefits on asbestos-related disease claims.
296-14-900	Purpose.
296-14-910	Definitions.
296-14-920	Qualification criteria.
296-14-930	Application by attorneys.
296-14-940	List of attorneys.
296-14-950	Appointment of attorney as special assistant.
296-14-960	Limitations of appointment.

WAC 296-14-300 Mental condition/mental disabilities. (1) Claims based on mental conditions or mental disabilities caused by stress do not fall within the definition of an occupational disease in RCW 51.08.140.

Examples of mental conditions or mental disabilities caused by stress that do not fall within occupational disease shall include, but are not limited to, those conditions and disabilities resulting from:

- (a) Change of employment duties;
- (b) Conflicts with a supervisor;
- (c) Actual or perceived threat of loss of a job, demotion, or disciplinary action;
- (d) Relationships with supervisors, coworkers, or the public;
- (e) Specific or general job dissatisfaction;
- (f) Work load pressures;
- (g) Subjective perceptions of employment conditions or environment;

- (h) Loss of job or demotion for whatever reason;
- (i) Fear of exposure to chemicals, radiation biohazards, or other perceived hazards;
- (j) Objective or subjective stresses of employment;
- (k) Personnel decisions;
- (l) Actual, perceived, or anticipated financial reversals or difficulties occurring to the businesses of self-employed individuals or corporate officers.

(2) Stress resulting from exposure to a single traumatic event will be adjudicated with reference to RCW 51.08.100.

[Statutory Authority: Chapters 51.08 and 51.32 RCW. 88-14-011 (Order 88-13), § 296-14-300, filed 6/24/88.]

WAC 296-14-350 Claim allowance and wage determination in occupational disease cases. (1) The liable insurer in occupational disease cases is the insurer on risk at the time of the last injurious exposure to the injurious substance or hazard of disease which gave rise to the claim for compensation.

(2) The compensation schedules and wage base for claims filed prior to July 1, 1988, shall be determined according to the schedule in effect and the wage paid, if wage based schedules apply, at the time of the last injurious exposure to the substance or hazard giving rise to the claim for compensation.

(3) The compensation schedules and wage base for claims filed on or after July 1, 1988, shall be determined as follows:

(a) If the worker was employed at the time the disease required medical treatment or became totally or partially disabling, whichever occurred first, compensation shall be based on the monthly wage paid on that date regardless of whether the worker is employed in the industry that gave rise to the disease or in an unrelated industry.

(b) If the worker was not employed, for causes other than voluntary retirement, at the time the disease required medical treatment or became totally or partially disabling, whichever occurred first, compensation shall be based upon the last monthly wage paid.

(c) Benefits shall be paid in accordance with the schedules in effect at the time the disease required medical treatment or became totally or partially disabling, whichever occurred first, without regard to the date of the contraction of the disease or the date of filing the claim.

[Statutory Authority: Chapters 51.08 and 51.32 RCW. 88-14-011 (Order 88-13), § 296-14-350, filed 6/24/88.]

WAC 296-14-400 Reopenings for benefits. The director at any time may, upon the workers' application to reopen for aggravation or worsening of condition, provide proper and necessary medical and surgical services as authorized under RCW 51.36.010. This provision will not apply to total permanent disability cases, as provision of medical treatment in those cases is limited by RCW 51.36.010.

The seven-year reopening time limitation shall run from the date the first claim closure becomes final and shall apply to all claims regardless of the date of injury.

In order for claim closure to become final on claims where closure occurred on or after July 1, 1981, the closure must include documentation of medical recommendation, advice or examination. Such documentation is not required for closing orders issued prior to July 1, 1981. First closing orders issued between July 1, 1981, and July 1, 1985, shall for the purposes of this section only, be deemed issued on July 1, 1985.

In order to support a final closure based on medical recommendation or advice the claim file must contain documented information from a doctor, or nurse consultant (departmental) or a nurse practitioner supervised by a doctor. The doctor or nurse consultant or nurse practitioner may be in private practice, acting as a member of a consultation group, employed by a firm, corporation, or state agency.

For the purpose of this section, a "doctor" means the following professions: Medicine and surgery; osteopathic; chiropractic; drugless therapeutic; podiatry; dentistry; optometry. WAC 296-20-01002.

When a claim has been closed by the department or self-insurer for sixty days or longer, the worker must file a written application to reopen the claim. An informal written request filed without accompanying medical substantiation of worsening of the condition will constitute a request to reopen, but the time for taking action on the request shall not commence until an application form provided by the department has been completed in full by the worker and the doctor and filed with the department or self-insurer as the case may be.

A formal application occurs when the worker and doctor completes and files the application for reopening provided by the department. Upon receipt of an informal request without accompanying medical substantiation of worsening of the worker's condition, the department or self-insurer shall promptly provide the necessary application to the worker for completion.

Applications for reopenings filed on or after July 1, 1988, must be acted upon by the department within ninety days of receipt of the application by the department or the self-insurer. The ninety-day limitation shall not apply if the worker files an appeal or request for reconsideration of the department's denial of the reopening application.

The department may, for good cause, extend the period in which the department must act for an additional sixty days. "Good cause" for such an extension may include, but not be limited to the following:

- (1) Inability to schedule a necessary medical examination within the ninety-day time period;
- (2) Failure of the worker to appear for a medical examination;
- (3) Lack of clear or convincing evidence to support reopening or denial of the claim without an independent medical examination;
- (4) Examination scheduled timely but cannot be conducted and a report received in sufficient time to render a decision prior to the end of the ninety-day time period.

The department shall make a determination regarding "good cause" in a final order as provided in RCW 51.52.050.

The ninety-day limitation will not apply in instances where the previous closing order has not become final.

[Statutory Authority: Chapters 51.08 and 51.32 RCW, 88-14-011 (Order 88-13), § 296-14-400, filed 6/24/88.]

WAC 296-14-600 Payment of benefits on asbestos-related disease claims. The department shall furnish the benefits provided under Title 51 RCW to any worker or beneficiary who may have a right or claim for benefits under the maritime laws of the United States resulting from an asbestos-related disease if there are objective clinical findings to substantiate that the worker has an asbestos-related claim for occupational disease; and the worker's employment history has a prima facie indicia of injurious exposure to asbestos fibers while employed in the state of Washington in employment covered under Title 51 RCW.

(1) A worker's employment history will be deemed to have a prima facie indicia of injurious exposure to asbestos fibers if the employment history as contained in the department's file permits a reasonable conclusion that the worker was exposed to asbestos fibers and that such exposure was of sufficient duration to be injurious. "Injurious" means impairing to either a partial or total extent, and may be either permanent or temporary.

(2) Whenever the department has determined to pay benefits pursuant to chapter 271, Laws of 1988, the department shall render a decision as to the liable insurer and shall continue to pay benefits until the liable insurer initiates payments or benefits are otherwise properly terminated.

The department shall render its decision in a final order as provided in RCW 51.52.050.

Initiation of payments by a liable insurer shall be deemed to occur on the date such insurer issues a check or warrant or otherwise remits to the worker, beneficiary, or any provider any payment of any benefits owed by such insurer on the claim for asbestos.

(3) Benefits shall be paid on all pending asbestos-related claims as of July 1, 1988. Pending claims are those which have not been finally adjudicated by order of the department or the board of industrial insurance appeals or by the entry of a judgment of a superior court or decision of the court of appeals or the supreme court.

If any order of the department granting such benefits is appealed, benefits shall continue, if otherwise available, until a final determination is made by the board of industrial insurance appeals or the courts, or upon initiation of payments by a liable insurer.

(4) If benefits are paid by the department from the medical aid fund on an asbestos-related claim, and it is determined by the department that such benefits are owed to the worker or beneficiary by an insurer under the maritime laws of the United States or by another federal program other than the Federal Social Security, Old Age Survivors and Disability Insurance Act, 42 U.S.C., the department shall pursue such insurer or program to recover such benefits as may have been paid by the department.

The determination by the department shall be expressed in a final order as provided by RCW 51.52.050.

(5) Whenever a self-insured employer is determined to be liable, the self-insured employer shall reimburse benefits to the department within ten days after the department order becomes final and binding. Failure to do so shall subject the employer to a penalty as authorized in RCW 51.48.080.

(6) The director's discretion to waive recovery of the benefits paid to the claimant or beneficiary shall be exercised in accordance with WAC 296-14-200 (3)(c).

(7) No information obtained under this section is subject to release by subpoena or other legal process. The department will release information only to those persons authorized access to claim files by RCW 51.28-.070.

[Statutory Authority: Chapters 51.08 and 51.32 RCW, 88-14-011 (Order 88-13), § 296-14-600, filed 6/24/88.]

WAC 296-14-900 Purpose. WAC 296-14-900 through 296-14-960 implement RCW 51.24.110, which authorizes the department to maintain a list of attorneys from which the attorney general may appoint special assistant attorneys general to represent the department in causes of action under RCW 51.24.050.

[Statutory Authority: RCW 51.24.110, 88-08-026 (Order 88-03), § 296-14-900, filed 3/31/88.]

WAC 296-14-910 Definitions. In WAC 296-14-900 through 296-14-960:

(1) "Assistant director" means the assistant or deputy director of the industrial insurance division of the department.

(2) "Department" means the department of labor and industries.

[Statutory Authority: RCW 51.24.110, 88-08-026 (Order 88-03), § 296-14-910, filed 3/31/88.]

WAC 296-14-920 Qualification criteria. To qualify for the list of attorneys from which appointments may be made to represent the department as special assistant attorneys general, an attorney must meet the following minimum criteria. An attorney must:

(1) Be an active member of the Washington State Bar Association;

(2) Maintain a trust account in compliance with the rules of professional conduct; and

(3) Have and maintain in force professional liability insurance.

[Statutory Authority: RCW 51.24.110, 88-08-026 (Order 88-03), § 296-14-920, filed 3/31/88.]

WAC 296-14-930 Application by attorneys. (1) An attorney who meets the qualification criteria may seek inclusion on the list of attorneys by filing an application with the assistant director. Application forms may be obtained from the office of the attorney general, the Washington State Bar Association, or the assistant director.

(2) The application form shall be prepared by the department in consultation with the office of the attorney general. The application shall require the applicant to declare under penalty of perjury that the information is

true and shall require the applicant to inform the assistant director and the attorney general of any changes in his or her qualifications.

[Statutory Authority: RCW 51.24.110. 88-08-026 (Order 88-03), § 296-14-930, filed 3/31/88.]

WAC 296-14-940 List of attorneys. (1) The department shall determine whether an attorney meets the criteria of WAC 296-14-920. The department may consult with the Washington State Bar Association and the office of the attorney general if necessary to make the determination.

(2) After an attorney has been entered on the list of attorneys, the assistant director shall forward the attorney's completed application form to the attorney general.

(3) The assistant director shall maintain the list of attorneys from which the attorney general may appoint special assistant attorneys general to represent the department.

(4) The assistant director shall, once every three months, provide the attorney general and the Washington State Bar Association with a current copy of the list of attorneys.

[Statutory Authority: RCW 51.24.110. 88-08-026 (Order 88-03), § 296-14-940, filed 3/31/88.]

WAC 296-14-950 Appointment of attorney as special assistant. (1) In its sole discretion, the department may ask the attorney general to appoint a special assistant attorney general to represent the department on any particular cause of action assigned to the department under RCW 51.24.050.

(2) Upon receipt of a request from the department, the attorney general may appoint as a special assistant attorney general an attorney from the list of attorneys maintained by the assistant director. The attorney general may also appoint to represent the department a regularly employed assistant attorney general. The department recognizes that the appointment is entirely within the discretion of the attorney general.

(3) An appointment of an attorney from the list shall be made pursuant to contract between the attorney general and the attorney. The contract shall specify the method of compensation for the attorney.

(4) RCW 51.24.110 and WAC 296-14-900 through 296-14-960 do not give to attorneys on the list any right to or any expectation of employment as a special assistant attorney general.

[Statutory Authority: RCW 51.24.110. 88-08-026 (Order 88-03), § 296-14-950, filed 3/31/88.]

WAC 296-14-960 Limitations of appointment. (1) An appointment may be made pursuant to this chapter only in causes of action assigned to the department under RCW 51.24.050.

(2) An appointment shall be for the single case only unless the contract of appointment specifically states otherwise.

(3) Under any appointment made pursuant to this chapter, the client of the special assistant attorney general is the department, not the injured worker.

[Statutory Authority: RCW 51.24.110. 88-08-026 (Order 88-03), § 296-14-960, filed 3/31/88.]

Chapter 296-15 WAC

WORKERS' COMPENSATION SELF-INSURANCE RULES AND REGULATIONS

WAC

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WAC 296-15-020 Application. (1) The application for certification to self-insure will be made only by those firms who have been in business for a minimum of three years, on a form prescribed by the department which will elicit necessary information as to an employer's qualifications for self-insurance.

(2) The application shall be supplied by the department to an employer upon the employer's request. It shall be completely and accurately filled out by the employer, and forwarded, with all necessary supporting documents, to the director.

(3) The director shall consider all matters relating to the applicant's qualifications to perform as a self-insurer, and shall advise the employer of the action taken on the application thirty days before the requested certification date. If deemed necessary for obtaining further information, the director may extend the time for acting on the application. Employers who are denied certification due to deficient accident prevention programs may be required to wait six months before being considered for certification again.

[Statutory Authority: RCW 51.04.020. 88-12-096 (Order 88-07), § 296-15-020, filed 6/1/88; 86-14-079 (Order 86-25), § 296-15-020, filed 7/1/86. Statutory Authority: RCW 51.04.020(1). 83-24-027 (Order 83-22), § 296-15-020, filed 12/1/83, effective 1/1/84; Order 77-19, § 296-15-020, filed 9/26/77; Order 71-15, § 296-15-020, filed 12/1/71.]

WAC 296-15-022 Corporate guarantee. If the applicant employer is a subsidiary, the parent firm will furnish the department with its guarantee to assume and be responsible for the workers' compensation liabilities of the subsidiary in the event the subsidiary firm is unable or unwilling to cover these liabilities. If a self-insurer is purchased by another firm, which becomes its parent, the parent must provide the department with its most recent audited financial statement and its guarantee. This guarantee is to be on a form prescribed by the department. A parent firm is defined as one which owns

fifty percent, and has a controlling interest in, another firm.

[Statutory Authority: RCW 51.04.020, 88-12-096 (Order 88-07), § 296-15-022, filed 6/1/88. Statutory Authority: RCW 51.04.020(1), 83-24-027 (Order 83-22), § 296-15-022, filed 12/1/83, effective 1/1/84.]

WAC 296-15-023 Entities included in certification.

(1) The certification of a firm will include all of its subsidiaries or divisions doing business in the state of Washington. A subsidiary is defined, for the purpose of this rule, as an entity which is fifty percent owned and has its interest controlled by another single firm.

(2) One certificate will be issued to an approved self-insurer, including all subsidiaries or divisions. The entities will be considered as one employer for all purposes of Title 51 RCW.

[Statutory Authority: RCW 51.04.020, 88-12-096 (Order 88-07), § 296-15-023, filed 6/1/88; 86-14-079 (Order 86-25), § 296-15-023, filed 7/1/86. Statutory Authority: RCW 51.04.020(1), 83-24-027 (Order 83-22), § 296-15-023, filed 12/1/83, effective 1/1/84.]

WAC 296-15-030 Posting of security. Subsections (1), (2), (3), and (4) of this section shall apply only to individual self-insurers except counties, cities, school districts, municipal corporations, and individual accounts participating in a group self-insurance program. Subsection (6) of this section shall apply only to counties, cities, municipal corporations, and school districts not participating in a group self-insurance program. Group self-insurance programs are subject to reserve requirements set forth in WAC 296-15-02601(3) and 296-15-02605, in lieu of application of this section.

(1) Upon receiving a completed application for certification to self-insure, the director shall review the matter and notify the employer of the amount of security which must be deposited to secure the payment of compensation and assessments, pursuant to RCW 51.14.020 as now or hereafter amended. This amount as so established may be satisfied by the employer's supplying of money, corporate or governmental securities approved by the director, or a surety bond, written by a company admitted to transact surety business in this state, in favor of the department. All such securities of a self-insurer shall be deposited with an escrow agent appointed by the director and administered pursuant to a written agreement between the department, the self-insurer and the escrow agent. Securities shall be registered in the name of the escrow agent on behalf of the self-insurer. The original of all surety bonds submitted by self-insurers following approval by the director and the attorney general will be kept on file in the department.

(2) On or after July 1, 1985, the minimum amount of security required for initial certification as a self-insurer shall be the projected average cost of a permanent total disability claim for an injury occurring during the first year after the employer's self-insuring, including medical, time-loss, pension reserve, and any other miscellaneous claim costs paid prior to award of the pension. This average cost shall be calculated by the department on an annual basis.

The security required for initial certification as a self-insurer on or after July 1, 1985, may be greater than the minimum amount described above. In establishing such security requirements, the department shall estimate the following amounts:

(a) The estimated amount of accident and medical aid fund premium that the self-insurer would have paid to the state fund during the first year of self-insurance, if it had remained in the state fund.

(b) The estimated amount of incurred benefits for the first year of self-insurance, based on past experience with the state fund, adjusted for intervening changes in benefit schedules and exposure.

If either or both of the above amounts exceed the minimum security deposit described in this section, the department may require the larger of (a) or (b) of this subsection as a security deposit for initial certification as a self-insurer on or after July 1, 1985.

(c) The initial surety requirement for a self-insurer may be based on an estimate of the expected average annual incurred losses, made by an independent actuary.

(d) The initial surety requirement for a self-insurer may be based upon an estimate of the expected average annual incurred losses, net of expected payments during the first year, made by an independent actuary; provided:

(i) That the applicant self-insurer agrees in writing to provide the department with an estimate of the outstanding liability made by an independent actuary within sixty days of the end of each calendar year of certification, through the first full three years of self-insurance; and

(ii) That the applicant self-insurer agrees in writing that if an estimate from an independent actuary is not provided as indicated in (d) of this subsection, the department, each year, will automatically increase the self-insurers' surety requirement by the amount of its average annual incurred losses estimated at the time of certification.

The security required in accordance with the above procedures may be adjusted by the department if there are other known conditions which may alter the self-insurer's potential claim costs and/or its ability to pay them.

(3) The amount of security required of each self-insurer shall be reviewed periodically by the director to determine if there is need for any increase or decrease thereof. To facilitate this review a self-insurer's annual report (SIF #7) shall be required in the form prescribed by the director and supplied to all self-insurers.

Security requirements in effect on, or initially established after, July 1, 1985, shall not be increased unless and until one or more of the following conditions are met:

(a) An estimate of the self-insurer's outstanding claim liabilities, made by either the self-insured employer or the department, exceeds the amount of security in force; or

(b) The projected average cost of a permanent total pension claim for an injury in the current year, including medical, time-loss and any other miscellaneous claim

costs paid prior to award of the pension, exceeds the security in force for the employer by one hundred thousand dollars or more.

(4) The following procedure shall apply for purposes of updating security requirements:

(a) On July 1, 1985, the security requirement for each self-insurer shall be the larger of the following two amounts:

(i) The existing security in force for the self-insurer; or

(ii) The self-insurer's stated estimate of outstanding claim liabilities as shown on the 1984 self-insurer's annual report (SIF #7).

(b) On July 1, 1986, the security requirement for each self-insurer shall be the larger of the following amounts:

(i) The existing security in force for the self-insurer; or

(ii) The average of the self-insurer's stated estimate of outstanding claim liabilities as shown on the 1985 self-insurer's annual report (SIF #7) and the department's estimate of the self-insurer's outstanding claim liabilities as of December 31, 1985, made in accordance with provisions of (e) of this subsection; or

(iii) The minimum security requirement.

(c) On July 1, 1987, the security requirement for each self-insurer shall be the larger of the following amounts:

(i) The existing security in force for the self-insurer; or

(ii) The department's estimate of the self-insurer's outstanding claim liabilities as of December 31, 1986, made in accordance with provisions of (e) of this subsection; or

(iii) The minimum security requirement.

(d) After July 1, 1987, the security requirement for each self-insurer will be subject to review and increased or decreased at such times as the director deems necessary to maintain the adequacy of those requirements. Such review and adjustment, when made, shall be performed in accordance with provisions of (e) of this subsection.

(e) In establishing or adjusting security requirements for a self-insurer, the department may perform a runoff test of the adequacy of the employer's estimates of liabilities, by tracking the subsequent cost of claims (subsequent payments plus the employer's updated estimates of remaining liabilities). If the subsequent costs do not exceed original liability estimates, the employer's most recent estimates of claim liabilities shall be considered adequate for purposes of setting current security requirements for the employer.

If the runoff test shows that subsequent costs of claims exceed the employer's original estimates of outstanding liabilities, the department may apply a loss development factor to the employer's most recent estimates of claim liabilities to compensate for anticipated repetition of inadequate estimates. The loss development factor shall be based on the self-insured employer's experience.

The following special considerations shall apply in establishing or adjusting security requirements for a self-insurer:

(i) Pension claims – Reserve amounts attributable to death or permanent total disability claims independently secured by means of a surety bond or assignment of account, and which are included in estimates of outstanding claim liabilities as shown on the self-insurer's annual report (SIF #7), shall be deducted from estimates of outstanding claim liabilities made in accordance with other provisions of this section.

(ii) Reinsurance – Anticipated recoveries under reinsurance policies held by a self-insurer must be documented by the self-insurer and reported to the department to qualify for consideration in establishing security requirements. Such anticipated recoveries shall be applied to either the self-insurer's estimate of outstanding claim liabilities as shown on the most current self-insurer's annual report (SIF #7) or the department's estimate of the self-insurer's outstanding liabilities made in accordance with (e) of this subsection, whichever is greater. If the resulting estimate of claim liabilities net of reinsurance recoveries is less than the security requirements imposed by this section without adjustment for reinsurance, the security requirement shall be reduced accordingly; provided, that security requirements imposed upon initial certification of a self-insurer or based upon the projected average cost of a permanent total pension claim may be retained by the department regardless of other estimates of claim liabilities for the self-insurer.

(iii) Strict application of loss development factors based upon the runoff test presumes a consistency of reserving methodology and results for the self-insurer. If the department determines that an employer has changed its reserving methodology in such a way as to invalidate loss development factors based upon past experience, then the department shall make such adjustments to the procedure as it may deem appropriate under the circumstances.

(iv) The department will give full consideration to any evaluation of the self-insured employer's outstanding claim liabilities made by an independent qualified actuary. Such independent actuarial evaluations are optional and not required by this rule.

(f) Any changes to existing bonds and/or adjustments to bond amounts made by or required of a self-insurer on or after July 1, 1985, shall provide adequate security for all self-insured workers' compensation liabilities of the employer, regardless of when the claims giving rise to those liabilities were incurred. Changes contemplated by this subsection include, but are not limited to, designation of a new surety carrier, issuance of a replacement bond by a current surety carrier, and/or revision of the face amount of any bond whether by endorsement or issuance of a replacement bond. If a new surety carrier does not assume full responsibility for all past self-insured liabilities regardless of when incurred, the department may require that such liabilities be secured by other means.

(5) A self-insurer's annual report (SIF #7) shall be required of group self-insurance plans, in the form prescribed by the director and supplied to all group self-insurance plans.

(6) On January 1, 1987, the security requirement for counties, cities, school districts, and municipal corporations shall provide for sufficient revenues to satisfy one hundred percent of the estimated claims for the succeeding fiscal year. The county, city, school district, or municipal corporation shall provide a cumulative reserve fund comprised of governmental securities, surety bonds, or any legal source of funding, equal to no less than twenty-five percent of the estimated claims payments for the succeeding fiscal year, to satisfy unforeseen claims obligations: *Provided*, That the minimum security requirement shall be one hundred thousand dollars. If a jurisdiction's cumulative reserve fund as of the effective date of this section is not at the required level, it shall annually increase the amount of such fund by no less than one-fourth of the difference between the amount of such fund as of January 1, 1987, and the required level of such cumulative reserve fund.

By February 1 of each year, each county, city, school district, or municipal corporation shall certify in writing to the department, the security requirements, specifying the source, or sources, of revenues including securities, bonds, anticipated insurance recoveries, or other moneys. A copy of the officially adopted budget that sets forth the fund or funds, and the accounts as required by the state auditor's budget accounting reporting system to meet the minimum security requirement, expenses, and liabilities of industrial insurance shall be available to the department. Security requirements for governmental units shall be subject to an annual review by the department.

[Statutory Authority: RCW 51.04.020, 88-12-096 (Order 88-07), § 296-15-030, filed 6/1/88; 87-05-008 (Order 87-02), § 296-15-030, filed 2/9/87; 86-14-079 (Order 86-25), § 296-15-030, filed 7/1/86; 85-06-031 (Order 85-6), § 296-15-030, filed 3/1/85; Order 77-19, § 296-15-030, filed 9/26/77; Order 72-4, § 296-15-030, filed 4/25/72; Order 71-15, § 296-15-030, filed 12/1/71.]

WAC 296-15-065 Self-insurers' insolvency trust.

(1) For the purpose of interpretation of this section, the term "insolvent self-insurer" means a self-insurer who has defaulted upon any obligation under Title 51 RCW, and with respect to which default the director has taken action authorized by RCW 51.14.060.

(2) A self-insurance insolvency fund shall be established in the office of the state treasurer. The purpose of this fund shall be to pay, to the injured workers of insolvent self-insured employers under Title 51 RCW, any unsecured benefits to which such injured workers had become entitled, and to pay for the department's associated administrative costs, including attorneys' fees.

(3) This fund shall be financed by assessment, as follows: (a) Assessments shall be levied on a post-insolvency basis against all self-insurers, including any of which have surrendered certification at any time during the thirty-six months prior to the close of a quarter for which assessments to the insolvency fund are payable: *Provided, however*, That school districts, cities and counties are exempt from assessment(s) to finance such self-insurers' insolvency fund: *Provided, further*, That school districts, cities and counties shall not have their obligations discharged, in full or in part, with moneys

from said self-insurers' insolvency fund; (b) each assessment shall be a percentage of the payments made on all claims involving the self-insured employer; (c) assessments shall be levied on a quarterly basis as prescribed by the board of trustees established in this section; (d) assessments shall be payable each quarter, by the thirtieth day following the notice of assessment.

(4) The administration of an insolvent self-insurer's claims shall be the responsibility of the department until the security deposit as required by RCW 51.14.020 and/or the recovery from any court action concerning the self-insurer's workers' compensation liabilities have been exhausted.

(5) Establishing self-insurance insolvency fund assessment rates and administering the claims of insolvent self-insurers upon depletion of remedies for reimbursement of workers' compensation expenditures made by the department as specified under subsection (4) of this section shall be the responsibility of a five-member board of trustees, under the general supervision of the department's self-insurance section.

(6) Assessments for the self-insurers' insolvency fund shall be in amounts deemed adequate to reimburse the accident, medical aid and/or pension reserve funds for benefits paid from these funds to injured workers of insolvent self-insurers, and for associated administrative costs, including attorneys' fees. Any and all interest earned on assessments levied and collected by the board of trustees shall become a part of the self-insurers' insolvency fund, and be distributed only for the purposes for which the fund was established.

(7) The board of trustees shall be comprised of the director or the director's designee, three representatives of self-insured employers, and one representative of workers. Initially and thereafter, the director shall appoint the self-insurer representatives from a list of names submitted by state-wide organizations of self-insurers and others. Initially and thereafter, the director shall appoint the worker representative from a list of names submitted by an organization, state-wide in scope, which through its affiliates embraces a cross section and a majority of the organized labor of the state. Initial appointments shall be made within thirty days of the effective date of this section. Two of the initial appointees shall serve three-year terms, and two shall serve two-year terms. Thereafter, appointed representatives shall serve two-year terms. Each representative on the board of trustees shall have one vote.

(8) No later than March 31 of each year, the board of trustees shall report in writing to the workers' compensation advisory committee regarding the status of the insolvency fund as of the previous December 31, and summarize any events or transactions of interest or importance to the ongoing operation of the insolvency fund.

[Statutory Authority: RCW 51.04.020, 88-12-096 (Order 88-07), § 296-15-065, filed 6/1/88; 86-24-014 (Order 86-40), § 296-15-065, filed 11/24/86.]

WAC 296-15-070 Accident reports and claims procedures. (1) Reporting of accidents shall be on a form prescribed by the department, entitled the self-insurer's

accident report (SIF #2), which will be supplied to all self-insurers, and by self-insurers to their employees. Forwarding a completed copy of this form to the department for compensable claims immediately and medical only claims monthly after closing by the self-insured employer shall satisfy the initial accident reporting responsibility and statistical reporting responsibility under the law.

(2) A self-insurer, on denying any claim, shall provide to the claimant, the department, and the attending physician, within thirty days after such self-insurer has notice of the claim, a notice of denial of claim, substantially similar to the example SIF #4. With every such claim denial a self-insurer shall send to the department all information on which the denial was based.

(3) A self-insurer shall file a complete and accurate supplemental or final report on injury or occupational disease claims resulting in time loss payments, on a form substantially similar to labor and industries Form No. F207-005-000, self-insurer's report of occupational injury or disease, 7-86 (SIF-5) at the following times:

(a) Within five working days following the date the first time loss compensation is paid.

(b) Within five working days following the date the time loss compensation is terminated, reinstated, or the rate thereof changed.

(c) On the date a determination is requested or date temporary disability claim is closed.

(d) On all claims where vocational rehabilitation services have been provided, a rehabilitation outcome report must be submitted with the final SIF #5.

All medical reports and other pertinent information in the self-insurer's possession not previously forwarded to the department must be submitted with the request for all determinations.

(4)(a) A self-insured employer shall, upon notice of an industrial injury, provide the injured worker with the opportunity to file a self-insurer accident report (SIF-2) and shall notify the worker of his/her rights and responsibilities under Title 51 RCW. A completed copy of the self-insurer accident report (SIF-2), with an assigned department claim number, is to be provided to the worker within five working days of the date an injured worker submits the SIF-2 to the employer.

(b) A self-insurer, upon closure of a medical only claim, shall issue an order on a form prescribed by the department entitled self-insurer's claim closure order and notice (LI-207-20), which will be supplied to all self-insurers, and by the self-insurers to their employees, in compliance with reporting responsibilities under the law, a copy of which shall be sent to the attending physician.

The self-insurer shall submit monthly statistical information on medical only claims closed during the month by copy of the accident report (SIF #2). In medical only claims where vocational rehabilitation services have been provided, the self-insurer shall submit a rehabilitation outcome report with the self-insurers accident report (SIF-2) at the time of reporting claim closure.

(c) A self-insurer, upon closure of a temporary disability claim, shall issue an order on a format substantially similar to labor and industries Form No. F207-070-000, self-insured employer's time loss claim closure order and notice, 7-86. The self-insurer shall send a copy of the closing order and final SIF-5 to the claimant and the department at the time of closure of a temporary disability claim.

(d) When the department requests claim information by certified mail, the self-insurer shall submit all information in its possession dealing with the claim in question, within ten working days from the date of receipt of such certified mail.

(e) In any case where the department or the self-insured employer has issued an appealable order on a medical-only claim, all subsequent orders in that claim shall be issued by the department.

(f) When an application for reopening of claim for aggravation of condition is received by a self-insured employer or its authorized representative, it shall be the responsibility of the self-insured employer to forward it to the department within five working days from the date of receipt.

(5) Self-insurers may close temporary disability claims with the date of injury occurring July 1, 1986, through June 30, 1990, and occupational disease claims filed July 1, 1986, through June 30, 1990. Self-insured claims that involve a permanent partial disability, an order issued by the department resolving a disagreement, or return to work with a different employer are not subject to closure by the self-insurer.

[Statutory Authority: RCW 51.04.020, 88-12-096 (Order 88-07), § 296-15-070, filed 6/1/88; 86-18-037 (Order 86-35), § 296-15-070, filed 8/28/86. Statutory Authority: RCW 51.04.020(1), 83-24-027 (Order 83-22), § 296-15-070, filed 12/1/83, effective 1/1/84. Statutory Authority: RCW 51.04.020 and Title 51 RCW, 82-12-035 (Order 82-23), § 296-15-070, filed 5/27/82, effective 7/1/82; 81-24-040 (Order 81-29), § 296-15-070, filed 11/30/81; Order 77-19, § 296-15-070, filed 9/26/77; Order 72-15, § 296-15-070, filed 8/4/72; Order 71-15, § 296-15-070, filed 12/1/71.]

WAC 296-15-170 Cessation of business--Change of status. (1) A self-insurer that proposes to cease doing business entirely, or proposes to cease doing business in Washington, or proposes to dispose of, by sale or otherwise, the controlling interest of the business for which the certificate was issued shall immediately notify the department in writing of such proposed action and shall, upon request, surrender their certificate for cancellation.

(2) A self-insurer that amends its articles, charter or agreement of incorporation, association, copartnership or sole proprietorship so as to change its identity or business structure or in any manner so as to materially alter its status as a self-insured employer as it existed at the time of the issuance of its certificate shall, within thirty days notify the department in writing of such action and provide the department with information regarding any change in the status of such self-insured employer. The department may, at its discretion, ask for copies of any documents deemed necessary regarding such transactions.

(3) When a self-insurer sells, divests, or spins off a part of itself, self-insurance coverage for the separated part ends with the date of separation from the self-insurer. The selling self-insurer remains responsible for the liability for claims against the separated part occurring up to the date of the separation unless the department approves an alternative. If the separating part desires to be a self-insurer, an application for certification must be received by the department thirty days before the date of certification. If certification cannot be granted before the date of separation, industrial insurance coverage must be purchased effective with the date of separation.

[Statutory Authority: RCW 51.04.020, 88-12-096 (Order 88-07), § 296-15-170, filed 6/1/88; Order 75-28, § 296-15-170, filed 8/29/75, effective 1/1/76.]

WAC 296-15-190 Notification of rights and obligations.

(1) Self-insurers shall develop and maintain a comprehensive program designed to inform their employees about self-insurance and their rights and obligations. Such a program must include all present employees. Newly hired employees must be thoroughly advised of their industrial insurance rights and obligations during the first thirty calendar days of employment. The method and manner of advising employees of this program must have the approval of the department.

(2) This program shall include, but not be limited to the following:

(a) An explanation of the employees' industrial insurance rights and obligations.

(b) An explanation of the employer's claim processing system.

(c) A statement telling which employees are covered and under what circumstances coverage is provided.

(d) A complete explanation of the payment of all medical bills and the time loss compensation an injured worker can expect to receive if forced to lose time from work due to an injury, or occupational disease sustained at work and an explanation of the method used to periodically determine continued time loss certification.

(e) The extent of the coverage provided and the procedure for closing a claim.

(f) An explanation of the law and rules of the department relating to the payment of medical expenses incurred by an on-the-job injury or occupational disease and the procedure for making an application for reopening a closed claim.

(g) An explanation of the role of the department in claims processing. Such explanation shall include a description of the method and manner of requesting reconsideration of department orders and appealing orders of the department to the Board of Industrial Insurance Appeals. Further, the mailing address and phone number of the self-insurance offices shall be made known and available to all employees.

(h) An explanation of the supplemental pension fund assessment and the deduction made for that purpose.

(i) An explanation of the way an injured worker, or someone in his/her behalf, must file a claim. Such an explanation must include the statutory requirement that

a claim be filed within one year of the date of the injury or within two years following the date the worker received written notice from a physician of the existence of an occupational disease and that the injured worker is responsible for filing the claim with his/her employer along with the certification of a licensed physician as stated in RCW 51.28.020.

(j) An explanation of both scheduled and unscheduled permanent partial disability (PPD) awards.

(3) A self-insurer shall designate a person or persons reasonably accessible to the work locations to whom an injured worker or any employee may direct questions about industrial insurance matters. This individual should have sufficient knowledge to answer routine questions and have the responsibility of seeking answers to more complex problems.

[Statutory Authority: RCW 51.04.020, 88-12-096 (Order 88-07), § 296-15-190, filed 6/1/88; Order 75-28, § 296-15-190, filed 8/29/75, effective 1/1/76.]

WAC 296-15-215 Cash, bond or assignment of account alternative for death or permanent total disability.

An "assignment of account" as used in this rule means a legal instrument executed by a self-insurer and a federally or state chartered commercial banking institution authorized to conduct business in the state of Washington, for the benefit of the department of labor and industries, which accomplishes the following:

(1) Identifies an existing account on deposit with the banking institution in the name of the self-insurer, which account contains an amount no less than the amount deemed by the department to be sufficient to insure the payment of pension benefits required by law for the claim on which the assignment of account is made, above and beyond any and all other existing assignments on that account.

(2) Binds the self-insurer to maintain a balance in that account at least equal to the current present cash value of the pension benefits provided by law on the claim for which the assignment of account is made, above and beyond all other assignments on that account, for the life of the claim. Present cash values shall be revised annually by the department in conjunction with the insurance commissioner's report as prescribed in RCW 51.44.140. Quarterly payments of pension, if made from the assigned account, shall not reduce the account balance below the present cash value last established by the department on the claim.

(3) Authorizes the department of labor and industries, upon default of the self-insurer, in any payment of any obligation on the claim for which the assignment of account has been made, to immediately without notice withdraw from the account without obligation of reimbursement of any amount, up to and including the entire amount specified in the assignment of account document, necessary to implement the cash alternative prescribed in RCW 51.44.070(1).

Upon establishment of a death or permanent total disability obligation, the self-insured employer may elect to pursue the bond or assignment of account alternative outlined in RCW 51.44.070(2). In all such cases, cash,

bond or assignment of account, the department shall commence to pay benefits immediately upon issuance of an order establishing such obligation. In the event there is a retroactive payment of benefits in the establishment of such obligation, and the self-insured employer elects to pursue RCW 51.44.070(2), this payment shall be made at the time the employer submits the required cash deposit. All further obligations paid by the department from the pension reserve fund shall be reimbursed to the department by the self-insured through the quarterly report system in accordance with RCW 51.44.070(2). Upon election of RCW 51.44.070(2) the self-insured employer shall submit a bond or assignment of account in the amount deemed by the insurance commissioner to be reasonably sufficient to insure payment of the pension benefits provided by law. Such bond or assignment of account and required cash deposit shall be filed with the self-insurance section no later than sixty days after the funding order establishing the amount of the death or permanent total disability obligation was communicated to the parties. The bond or assignment of account alternative as prescribed by RCW 51.44.070(2) shall be allowed only once on any given claim elected at the time of the establishment of such obligation. In the event the amount of the bond is subsequently deemed insufficient and the self-insurer is unable to secure the required bond obligation the employer shall deposit cash into the reserve fund, pursuant to RCW 51.44.070(1), to replace the bond obligation. In the event the amount of the assignment of account is subsequently deemed insufficient and the self-insurer is unable to provide the required assignment of account, the employer shall deposit cash into the reserve fund, pursuant to RCW 51.44.070(1), to replace the assignment of account. Funds available within the existing assignment of account shall, in this instance, be withdrawn by the department, deposited in the reserve fund, and credited toward the employer's obligation for the claim pursuant to RCW 51.44.070(1).

A separate assignment of account shall be established for each pension and, in case of failure of a banking institution carrying an assignment of account, the employer is responsible for the total amount of the obligation. Upon such failure of a banking institution, the self-insured employer shall, within thirty days, 1) establish a new assignment of account pursuant to this rule, or 2) deposit cash into the reserve fund to replace the obligation. If an employer terminates its self-insured status, the assignment of account will be placed with the department. The required reserve will be determined by the insurance commissioner and any excess will be returned to the employer.

[Statutory Authority: RCW 51.04.020, 88-12-096 (Order 88-07), § 296-15-215, filed 6/1/88; 85-06-031 (Order 85-6), § 296-15-215, filed 3/1/85. Statutory Authority: RCW 51.04.020(1), 83-24-027 (Order 83-22), § 296-15-215, filed 12/1/83, effective 1/1/84. Statutory Authority: RCW 51.04.020 and Title 51 RCW, 81-23-047 (Order 81-27), § 296-15-215, filed 11/18/81.]

WAC 296-15-250 Representation in self-insured appeals. Pursuant to the authority granted by RCW 51.52.100, the department may, through the office of the

attorney general, appear in proceedings before the board of industrial insurance appeals to defend any of the department orders appealed to the board of industrial insurance appeals by a self-insured employer or a claimant or beneficiaries when such action is deemed necessary to protect the department's interests. The department may support medical and other witness fees which, in the department's opinion, are necessary to defend its order.

This rule will apply to appeals filed with the board of industrial insurance appeals on or after the effective date of this rule.

[Statutory Authority: RCW 51.04.020, 88-12-096 (Order 88-07), § 296-15-250, filed 6/1/88. Statutory Authority: RCW 51.14.020(1), 83-18-038 (Order 83-28), § 296-15-250, filed 9/1/83.]

Chapter 296-16 WAC EMPLOYER--WORKER REEMPLOYMENT INCENTIVES

WAC
296-16-010 Premium waived for employment of preferred worker.

WAC 296-16-010 Premium waived for employment of preferred worker. In order to implement the provisions of RCW 51.16.120(3) by way of encouraging employment of injured workers who are not reemployed by the employer at the time of injury, the following provisions are adopted:

Any employer who employs a "preferred worker" as defined in these rules shall be excused from the payment of industrial insurance premiums and/or accident costs under the circumstances and conditions herein provided:

(1) A "preferred worker" may be classified as such by the department when the supervisor or his or her designee shall determine, in his or her discretion, that such person has sustained an industrial injury or occupational disease under our state Industrial Insurance Act which prevents the worker from returning to work with the former employer and that such injury or occupational disease is substantially impairing the likelihood of such worker's reemployment with other employers. A worker may be certified as a preferred worker for a period not to exceed thirty-six calendar months.

(2) Any state fund employer, other than the employer at the time of injury or exposure, who employs a "preferred worker" shall be excused, during the period of employment of such worker but not to exceed thirty-six calendar months, from the payment of any accident fund premiums and medical aid premiums which would otherwise be due based upon such employment.

(3) In the event that a further injury or occupational disease is sustained by a reemployed "preferred worker" during the first thirty-six months subsequent to the hiring of such "preferred worker," while in the employ of the accepting employer, such employer, whether insured by the state fund or self-insured, shall not be charged with the costs of any such claim which would otherwise be charged to or paid by such employer. Such costs shall be charged against the second injury fund.

The provisions of subsections (2) and (3) of this section shall apply only if the intent to hire form is completed and received by the department within sixty days from the first day of employment. Receipt of the intent to hire form authorizes the department to assign the appropriate risk classification to the employers' account.

[Statutory Authority: RCW 51.16.120(3) and 51.32.095. 88-21-022 (Order 88-24), § 296-16-010, filed 10/10/88. Statutory Authority: RCW 51.04.020(1) and 51.16.120(3). 85-13-027 (Order 85-12), § 296-16-010, filed 6/11/85. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-033 (Order 80-24), § 296-16-010, filed 12/1/80, effective 1/1/81.]

Chapter 296-17 WAC

MANUAL OF RULES, CLASSIFICATIONS, RATES, AND RATING SYSTEM FOR WASHINGTON WORKERS' COMPENSATION INSURANCE

WAC

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296-17-566	Classification 2202.
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296-17-594	Classification 3602.
296-17-598	Repealed.
296-17-600	Classification 3702.
296-17-603	Classification 3707.
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296-17-920	Assessment for supplemental pension fund.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-17-330	Officers or members of a corporate employer. [Statutory Authority: RCW 51.16.035. 85-24-032 (Order 85-33), § 296-17-330, filed 11/27/85, effective 1/1/86; 84-24-016 (Order 84-23), § 296-17-330, filed 11/28/84, effective 1/1/85. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-330, filed 11/30/79, effective 1/1/80. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 78-12-043 (Order 78-23), § 296-17-330, filed 11/27/78, effective 1/1/79; Order 75-28, § 296-17-330, filed 8/29/75, effective 10/1/75; Order 74-40, § 296-17-330, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-330, filed 11/9/73, effective 1/1/74.] Repealed by 87-24-060 (Order 87-26), filed 12/1/87, effective 1/1/88. Statutory Authority: RCW 51.16.035.
296-17-340	Sole proprietors and partners. [Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-340, filed 5/29/87, effective 7/1/87; 84-24-016 (Order 84-23), § 296-17-340, filed 11/28/84, effective 1/1/85; Order 75-28, § 296-17-340, filed 8/29/75, effective 10/1/75; Order 74-40, § 296-17-340, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-340, filed 11/9/73, effective 1/1/74.] Repealed by 87-24-060 (Order 87-26), filed 12/1/87, effective 1/1/88. Statutory Authority: RCW 51.16.035.
296-17-480	Penalty assessment for failure to keep records, or file quarterly reports and pay premiums under Title 51 RCW. [Statutory Authority: RCW 51.16.035. 83-24-017 (Order 83-36), § 296-17-480, filed 11/30/83, effective 1/1/84. Statutory Authority: RCW 51.04.020(1). 83-05-019 (Order 83-5), § 296-17-480, filed 2/9/83.] Repealed by 87-24-060 (Order 87-26), filed 12/1/87, effective 1/1/88. Statutory Authority: RCW 51.16.035.
296-17-598	Classification 3606. [Statutory Authority: RCW 51.16.035. 85-24-032 (Order 85-33), § 296-17-598, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-598, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-598, filed 11/30/83, effective 1/1/84; Order 73-22, § 296-17-598, filed 11/9/73, effective 1/1/74.] Repealed by 88-12-050 (Order 88-06), filed 5/31/88, effective 7/1/88. Statutory Authority: RCW 51.16.035.
296-17-87309	Classification assignments—Applicability. [Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-87309, filed 11/30/79, effective 1/1/80.] Repealed by 87-12-032 (Order 87-12), filed 5/29/87, effective 7/1/87. Statutory Authority: RCW 51.16.035.

WAC 296-17-310 General rules and instructions.
This section constitutes general rules and instructions for chapter 296-17 WAC.

(1) **Purposes.** This chapter of the Washington Administrative Code, including classifications of risk, premium rates, the experience rating plan, and all other rules contained herein governing the use thereof, is herein referred to as the manual. This manual is promulgated by the department of labor and industries pursuant to RCW 51.16.035. This manual contains a formulation of the rules and regulations providing for basic classifications, rates of premium, method of premium calculation and collection, and a rating system, consistent with recognized principles of workers' compensation insurance. This manual governs the department's underwriting of workers' compensation insurance and assessment of other monetary obligations, under the industrial insurance law of the state of Washington, Title 51 RCW.

(2) **Overview.** Washington law (RCW 51.16.035) requires that the department of labor and industries classify all occupations or industries by degree of hazard. To accomplish this, the department has established approximately two hundred seventy basic classifications of risk embracing the various industries within the state (the actual number may vary from year to year). These basic classifications are set forth in WAC 296-17-501 through 296-17-779. The general principles and objectives of the basic classification system are set forth in WAC 296-17-310.

The first step in determining the appropriate classification for an employer is to determine the nature of the employer's business being insured in this state. If the department determines that an employer's business consists of a single operation or a number of separate operations which normally prevail in that business then the single enterprise rule (WAC 296-17-380) is applicable. This rule provides that the department is to assign the single basic classification which most accurately describes the employer's entire enterprise. This process begins with the search for a basic classification which specifically describes the employer's business. If such a basic classification is found the process of assigning a basic classification is complete.

If the employers' business operation is not specifically described by any basic classification then the employer's business is to be classified as provided for in WAC 296-17-360 (assignment of classification by analogy). In classifying by analogy the department examines the process and hazard of the employer's business and compares it to that of other basic classifications with processes and hazards that are similar to those of the employer's business and assigns the most analogous classification on that basis.

In the event that a review of the employer's business operations indicates the possibility that the employer conducts more than one business within this state, a determination will be made as to whether any additional basic classifications should be assigned on the basis of the criteria set out in the multiple enterprise rule (WAC 296-17-390).

Once the employer's basic classification has been established, the department must determine whether additional classifications should be assigned to apply to specific employments within an employer's business such as the standard exception rule (WAC 296-17-440), the general exclusion rule (WAC 296-17-430), the special exception rule (WAC 296-17-441), or those indicated by the language of any applicable basic classifications that permit or require separate reporting of any operations within that business or industry or as otherwise provided by this chapter.

(3) **Premium payments - quarterly reports.** Each employer shall, upon such forms as prescribed by the department, prior to the last day of January, April, July and October of each year, pay to the department for the preceding calendar quarter, for the accident fund, and for the medical aid fund, a certain number of cents for each worker hour or fraction thereof worked by the worker in their employ except when the rules of this manual provide for a different method of premium computation. Provided, that in the event an employer has no employment subject to coverage under Title 51 RCW during a calendar quarter the employer shall submit to the department, according to the schedule described above, a quarterly report indicating "no payroll" or be subject to the penalties provided for in RCW 51.48.030. The director may promulgate, change and revise such rates at such times as necessary, according to the condition of the accident and medical aid funds, and assign rates as appropriate to employers who voluntarily seek coverage under the elective adoption provisions of the law.

(4) **Determining accident fund premium.** The amounts to be paid into the accident fund shall be determined as follows: The department shall determine a manual premium rate for each classification which shall not be inadequate, excessive or unfairly discriminatory, taking into consideration past and prospective costs in each classification and the financial condition of the accident fund as a whole.

Every employer shall pay into the accident fund at the manual premium rate unless such employer meets the requirements for the experience rating plan provided elsewhere in this manual, in which event such employer's premium rate for the accident fund shall be paid according to their experience modification as determined under the experience rating plan.

(5) **Basis for determining medical aid premium.** The amounts to be paid into the medical aid fund shall be determined as follows: The department shall determine a manual medical aid rate for each classification which shall not be inadequate, excessive or unfairly discriminatory, taking into consideration past and prospective costs in each classification and the financial condition of the medical aid fund as a whole.

Every employer shall pay into the medical aid fund at the manual premium rate unless such employer meets the requirements for the experience rating plan provided elsewhere in this manual, in which event such employer's

premium rate for the medical aid fund shall be paid according to their experience modification as determined under the experience rating plan.

(6) All section captions or titles or catch lines used in this manual, chapter 296-17 WAC, do not constitute any part of these rules.

(7) **Assignment of classifications.** The classifications in this manual are all basic classifications other than the standard exception classifications which are defined in WAC 296-17-440. Basic classifications are used to implement the object of the classification system, which is to assign the one basic classification which best describes the business of the employer within this state. Each basic classification includes all the various types of labor found in a business unless it is specifically excluded by language contained within the classification or covered by a separate rule found elsewhere in this chapter, such as "standard exceptions" or "general exclusions." The classification procedure used within this state is intended to classify the business undertaking of the employer and not the separate employments, occupations, or operations of individuals within a business.

In the event an employer operates a secondary business within this state, multiple basic classifications can be assigned provided that the conditions set forth in WAC 296-17-390 "multiple enterprises" have been met. However, construction or erection operations are to be assigned classifications as provided in subsection (8) of this section.

(8) **Construction or erection operations.** Each distinct type of construction or erection operation at a job site or location shall be assigned to the basic classification describing that operation provided separate payroll records are maintained for each operation.

In the event separate payroll records are not maintained the entire number of worker hours for such operations shall be assigned to the highest rated classification which applies to the job site or location where the operation is performed.

Separate construction or erection classifications shall not be assigned to any operation which is within the scope of another basic classification assigned to such a job site or location.

(9) **Classification assignment of separate legal entities.** Each separate legal entity shall be assigned to the basic classification or classifications which best describe its operations within the state using the classification procedures outlined in subsections (2), (7), and (8) of this section.

(10) **All operations.** Each basic classification in this manual, other than classifications 4806, 4904, 5206, 6301, 6302, 6303, 7101, or the temporary help classifications 7104 through 7121, include all the operations normally associated with the business undertaking without regard to the location(s) of such operation(s) unless an operation is specifically excluded from the manual language of the basic classification.

[Statutory Authority: RCW 51.16.035, 88-16-012 (Order 88-12), § 296-17-310, filed 7/22/88, effective 1/1/89; 88-12-050 (Order 88-06), § 296-17-310, filed 5/31/88, effective 7/1/88; 87-24-060 (Order 87-26), § 296-17-310, filed 12/1/87, effective 1/1/88; 87-12-032 (Order 87-12), § 296-17-310, filed 5/29/87, effective 7/1/87;

86-12-041 (Order 86-18), § 296-17-310, filed 5/30/86, effective 7/1/86; 85-24-032 (Order 85-33), § 296-17-310, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-310, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-310, filed 11/30/83, effective 1/1/84; Order 77-27, § 296-17-310, filed 11/30/77, effective 1/1/78; Order 75-28, § 296-17-310, filed 8/29/75, effective 10/1/75; Order 74-40, § 296-17-310, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-310, filed 11/9/73, effective 1/1/74.]

WAC 296-17-330 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-17-340 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-17-349 Corporate officer and limited partner—Coverage extended. In exercising its police and sovereign powers (RCW 51.04.010), the state of Washington has declared all phases of premises withdrawn from private controversy and has provided sure and certain relief for all workers injured in the course of employment. For the purposes of reducing to a minimum suffering and economic loss arising from injuries and/or death occurring in the course of employment, the department is instructed to liberally construe Title 51 RCW (see Employments included—Declaration of policy RCW 51.12.010.) Through the years certain employments have been excluded from mandatory coverage. It is available on an optional basis. Excluded employments are contained in RCW 51.12.020 and include certain partners and corporate officers.

Title 25 RCW governs the establishment, maintenance, continuation, and dissolution of partnerships. Title 23A RCW governs the formation, merger, consolidation, sale, and dissolution of corporations.

To carry forward the intent of both the coverage and exclusion provisions of Title 51 RCW and exercising the authority granted in RCW 51.04.020(1), the department does hereby establish and promulgate rules governing the assessment of premiums as it pertains to certain partners and corporate officers.

(1) **Corporate officers.** RCW 51.12.020(8) exempts from mandatory coverage those corporate officers who also concurrently sit on the corporation's board of directors and own stock in the corporation. It is not uncommon for corporations to issue various classes of stock. Not all classes of stock issued include voting rights in the overall management and direction of the company. The underlying intent of the corporate officer exemption is to exclude from coverage only those officers meeting the two prong test of share holder and director who are in a position similar to a proprietor to direct and control the business. In applying this exemption, the department will consider corporate officers exempt from coverage when they are elected to and sit on the corporation's board of directors and are in a position similar to a proprietorship to direct and control the business. Any corporate officer not meeting the above test who performs services for the corporation and receives compensation, either actual or anticipated, shall be reported as a worker on the corporation's quarterly report of payroll

and premiums paid on his/her behalf for workers compensation insurance.

(2) **Partners.** RCW 51.12.020(5) exempts from mandatory coverage partners other than those partnerships who after July 26, 1981, registered for the first time under chapter 18.27 RCW or become licensed for the first time under chapter 19.28 RCW. Partners of a partnership established after July 26, 1981, that fall within the mandatory provisions of the Industrial Insurance Act can voluntarily withdraw from coverage as provided for in RCW 51.12.115. Partnerships established in accordance with Title 25 RCW fall under the categories of general or limited. The underlying intent of the partner exemption is to only exempt from coverage those partners who are in a position to direct and control the business. These individuals are identified in the partnership agreement as "general" partners. Limited partners for the purposes of industrial insurance coverage will be considered to be employees of the partnership when they perform services for the partnership and receive compensation either actual or anticipated as distinguished from a distribution of profits and shall be reported on the partnership's quarterly report of payroll and premiums paid on their behalf.

[Statutory Authority: RCW 51.16.035. 88-06-048 (Order 88-01), § 296-17-349, filed 3/1/88, effective 4/1/88.]

WAC 296-17-350 Minimum premiums—Assumed worker hours. A minimum premium is the lowest amount of premium to be paid by an employer and is also the basis for determining premium computation for workers for whom an assumed number of worker hours must be, and hereby, is established:

(1) **Minimum premium.** Except as otherwise provided in this chapter, every employer shall be liable for a premium not less than ten dollars for any calendar quarter regardless of number of worker hours reported.

(2) **[Minimum premium for elective adoption.** Any employer having in their employ any person exempt from mandatory coverage whose application for coverage under the elective adoption provisions of RCW 51.12-.110 is accepted by the director, shall have a minimum premium rate for such employer's applicable class based upon not less than 40 worker hours for each month, until such time as elective adoption coverage is cancelled: *Provided*, That the minimum premium rate as specified above shall not apply to sole proprietors, partnerships, or executive officers obtaining coverage subject to other provisions of this chapter.]

[Excluded employments. Any employer having any person in their employ excluded from industrial insurance whose application for coverage under the elective adoption provisions of RCW 51.12.110 or authority of RCW 51.12.095 or 51.32.030 has been accepted by the director shall report and pay premium on the actual hours worked for each such person who is paid on an hourly, salaried-part time, percentage of profit or piece basis; or one hundred sixty hours per month for any such person paid on a salary basis employed full time. In the event records disclosing actual hours worked are not maintained by the employer for any person paid on an

hourly, salaried—part time, percentage of profits or piece basis the worker hours of such person shall be determined by dividing the gross wages of such person by the state minimum wage for the purpose of premium calculation. However, when applying the state minimum wage the maximum number of hours assessed for a month will be one hundred sixty.]

(3) Resident managers, caretakers, or similar employments that are employed for irregular periods and whose compensation is for a stipulated sum in money or a substitute for money shall be reported for the purpose of premium calculation as provided in subsection (6) of this section.

(4) **Commission personnel.** Commission personnel are persons whose compensation is based upon a percentage of the amount charged for the commodity or service rendered. Commission personnel are to be reported for premium purposes at a minimum of assumed worker hours of not less than eight worker hours a day for part-time employment, or not less than 40 worker hours per week for full-time employment: *Provided*, That the assumed eight worker hours daily for part-time employment will apply only if the employer's books and records are maintained so as to show separately such person's actual record of employment.

(5) **Salaried personnel.** Salaried personnel for the purposes of this chapter means persons whose compensation is not governed by the number of hours devoted to employment for their employer. Employers having salaried personnel in their employ shall for the purpose of premium calculation report assumed worker hours based upon one hundred sixty worker hours for each month in which the employee is on salary: *Provided*, That if the employer maintains complete and accurate records, supported by original time cards or timebook entries, the employer may report and pay premium on the actual hours worked by salaried personnel. All salaried personnel must be reported in the same manner]: *Provided further*, That the department may, at its discretion, authorize some other method in assuming workers hours for premium calculating purposes in the case of contract personnel employed by schools and/or school districts.

(6) **Piece workers.** For employees whose compensation is based upon the accomplishment of a number of individual tasks whether computed on the number of pounds, items, pieces, or otherwise who are not subject to any federal or state law or rule which requires the reporting of actual hours worked, the employer shall for the purpose of premium calculation assume each two dollars of earnings of each employee as representing one worker hour: *Provided*, That if the average rate of compensation for the applicable classification is at least \$3.00 but less than \$3.50 per worker hour the assumed amount shall be \$3.00 of earnings as representing one worker hour, and on a progressive basis, if the average compensation is at least \$3.50 but less than \$4.00 the assumed amount shall be \$3.50 of earnings as representing one worker hour, and so forth. The records of the department as compiled for the preceding fiscal year ending June 30, shall be the basis for determining the average rate of compensation for each classification:

Provided further, That an employer who maintains records but is not required to do so shall report the actual hours worked for the purpose of premium calculation. In the event an employer who is otherwise required by federal or state laws or rules to maintain records of actual hours worked by each employee fails to do so, the worker hours of such employees will be determined by dividing the gross wages of each employee by the state minimum hourly wage to determine the hours reported for the purpose of premium calculation. Notwithstanding any other provisions of this section, workers employed in a work activity center pursuant to WAC 296-17-779 shall be reported on the basis of the piece worker rule.

(7) **Noncontact sports teams.** All employers having personnel in their employ as defined under WAC 296-17-745 shall for the purpose of premium calculations, report assumed worker hours based upon 40 worker hours for each week in which any duties are performed.

(8) All employers having personnel in their employ as defined under WAC 296-17-739 shall, for the purpose of premium calculations, report assumed worker hours based upon ten hours for each mount in each horse race; professional drivers shall report worker hours based upon ten hours for each heat or race of any racing event: *Provided*, That any day such personnel do not ride or drive in a race, the premium calculation shall be made by assuming ten worker hours for any day in which duties are performed.

(9) Pilots and flight crew members having flight duties during a work shift including preflight time shall have premium calculated by utilizing daily readings logged per federal requirements of the aircraft tachometer time: *Provided*, That if the total tachometer time for any day includes a fraction of an hour, the reportable time will be increased to the next full hour: *Provided further*, That pilots and flight crew members who assume nonflying duties during a work shift will have premium calculated in accordance with the appropriate rules and classifications applicable to nonflight duties.

[(10) Licensed trainers—parimutuel racing. All trainers which come under the jurisdiction of the Washington horse racing commission and who become licensed subject to the Washington horse racing commission's rules and regulations who employ workers shall pay a minimum premium of one hundred dollars annually to the department which shall be in addition to a per start rate established for the various parimutuel tracks state-wide. The minimum premium shall be calculated using twenty assumed worker hours and be reported in classification 6613. For the purpose of premium calculation report assumed worker hours based upon ten hours for each start.]

[Statutory Authority: RCW 51.16.035. 88-14-076 (Order 87-31), § 296-17-350, filed 7/1/88, effective 1/1/89; 88-12-065 (Order 88-05), § 296-17-350, filed 5/31/88; 87-24-060 (Order 87-26), § 296-17-350, filed 12/1/87, effective 1/1/88; 85-06-026 (Order 85-7), § 296-17-350, filed 2/28/85, effective 4/1/85; 84-24-016 (Order 84-23), § 296-17-350, filed 11/28/84, effective 1/1/85. Statutory Authority: RCW 51.04.020(1). 84-11-034 (Order 84-11), § 296-17-350, filed 5/15/84. Statutory Authority: RCW 51.16.035. 83-24-017 (Order 83-36), § 296-17-350, filed 11/30/83, effective 1/1/84; 81-24-042 (Order 81-30), § 296-17-350, filed 11/30/81, effective 1/1/82.]

Statutory Authority: RCW 51.04.020(1) and 51.16.035. 78-12-043 (Order 78-23), § 296-17-350, filed 11/27/78, effective 1/1/79; Order 77-27, § 296-17-350, filed 11/30/77, effective 1/1/78; Order 77-10, § 296-17-350, filed 5/31/77; Order 76-18, § 296-17-350, filed 5/28/76, effective 7/1/76; Order 75-28, § 296-17-350, filed 8/29/75, effective 10/1/75; Order 74-40, § 296-17-350, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-350, filed 11/9/73, effective 1/1/74.]

Reviser's note: RCW 34.04.058 requires the use of underlining and deletion marks to indicate amendments to existing rules, and deems ineffectual changes not filed by the agency in this manner. The bracketed material in the above section does not appear to conform to the statutory requirement.

WAC 296-17-430 General exclusions. Some operations are so exceptional or unusual that they are excluded from the scope of all basic classifications. Such operations are referred to as general exclusions and are subject to the division of worker hours rules in all classifications including the standard exception classifications. The following operations are excluded from all basic classifications including the standard exception classifications unless they are specifically included.

- (1) Aircraft operation – All operations of the flying crew.
- (2) Racing operations – All operations of the drivers and pit crews.

In addition to the above two listed exclusions, the following operations are similarly excluded from all basic classifications, provided that no division of these operations shall be permitted between the basic classifications assigned to cover these operations and any standard exception classifications.

(a) New construction or alterations by employees of the employer.

(b) Musicians and entertainers.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-430, filed 5/29/87, effective 7/1/87; 85-06-026 (Order 85-7), § 296-17-430, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-430, filed 11/30/83, effective 1/1/84; Order 74-40, § 296-17-430, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-430, filed 11/9/73, effective 1/1/74.]

WAC 296-17-440 Standard exceptions. The following employments referred to as standard exceptions are to be separately rated unless these employments are specifically included within the scope of a basic classification by use of words such as "including clerical office and outside sales." (Use of the words "clerical office" will also include draftsmen and use of the words "sales personnel" will also include collectors, messengers and corporate officers.) Provided that a division of a single employee's worker hours shall not be permitted between two standard exception classifications or between a standard exception classification and a basic business classification except as provided in the general exclusion rules of this manual.

The standard exceptions are defined below:

(1) Clerical office employees are defined as those employees whose duties are confined to keeping the books or records of the employer, or conducting correspondence or who are engaged wholly in office work where such books or records are kept or where such correspondence is conducted, having no other duty of any nature

in or about the employer's premises. If any clerical office employee is exposed to any operative hazard of the business, their entire worker hours shall be assigned to the highest rated classification of work to which they are exposed. The clerical office classification shall be applied only to persons as herein described who are employed exclusively in separate buildings or on separate floors of buildings or in departments on such floors which are physically separated from all other work areas of the employer by structural partitions and within which no work is performed other than clerical office duties as defined in this paragraph.

(2) Draftsmen will be considered to be clerical office employees when their duties are limited to office work only and who are engaged strictly as draftsmen in such a manner that they are not exposed to the operative hazard of the business. If any draftsman is exposed to any operative hazard of this business, their entire worker hours shall be assigned to the highest rated classification of work to which they are exposed.

(3) "Sales personnel – outside" are defined as those employees engaged in such duties away from the premises of the employer who sell or solicit new accounts or customers for the employer or who service existing accounts or customers for the employer. Provided that no employee shall be assigned to a sales classification code if their duties include delivery, even though they may also solicit or collect. Employees having delivery duties, even if they walk or use public transportation, shall be assigned to the governing classification of the employer.

(4) Messengers will be considered sales employees, provided the following conditions are met:

(a) The messenger is used solely by the employer in connection with the administration of the employer's business operation.

(b) The operation is not provided to the public as a general delivery service.

(c) The employer's basic classification does not include the standard exception classification designations.

If all the above conditions do not exist, any employee assigned such duties shall be assigned to the governing classification of the employer when multiple basic classifications are assigned or to the basic classification in the event an employer has only a single basic classification assigned.

(5) Corporate officers are defined as those employees of a corporation elected and empowered in accordance with the articles of incorporation or bylaws as officers of the corporation who are also shareholders and serve on the board of directors of the corporation and whose duties are limited to administrative, clerical office and outside sales activities for the corporations. Any corporate officer who performs any duty that relates directly to the operational activities of the business shall be assigned to the basic classification(s) of the employer applicable to the work being performed. In no event however will a corporate officer be assigned the clerical office classification 4904.

With the exceptions of occupations falling within any classification that specifically includes clerical office, inside draftsmen or sales personnel, the following designated occupational classifications shall apply.

Classification 4904 clerical office employees including inside draftsmen.

Classification 6303 sales personnel, outside or away from the employers premises including collectors and messengers.

Classification 6301 automobile, truck, camper, trailer, mobile home, motorcycle and pleasure craft sales personnel.

Classification 6302 all door to door sales personnel.

Classification 7101 corporate officers.

[Statutory Authority: RCW 51.16.035. 87-24-060 (Order 87-26), § 296-17-440, filed 12/1/87, effective 1/1/88; 87-12-032 (Order 87-12), § 296-17-440, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-440, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-440, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-440, filed 11/30/83, effective 1/1/84; Order 73-22, § 296-17-440, filed 11/9/73, effective 1/1/74.]

WAC 296-17-450 Special agricultural classification interpretations. Farming in classifications 4802 through 4806, 4808, 4809, 4810, 4811, 7301, 7302, and 7307 will include farm labor by contractors and farm machinery operations by contractors.

To qualify for separate ratings (classifications), separate and distinct payroll records of each such operation will be required.

If a single establishment or work comprises more than one of classifications 4802 through 4806, 4808, 4809, 4810, 4811, 7301, 7302, and 7307 the premiums shall be computed according to the payroll of each classification provided distinct payroll records have been kept for each such operation, otherwise, the operation will be assigned to the highest rated classification representing any portion of the work being performed. The department in its discretion may assess a single rate of premium for an agricultural establishment when a substantial portion of the operation falls within one classification, and in such cases, the entire operation will be required to be reported in such largest classification: *Provided*, That under no circumstance will the hand-picking classification (4806) apply for the purpose of single rating an entire establishment engaged in other phases of agricultural activities. *Provided further*, that farm labor contractors shall be assigned the classification(s) applicable to the agricultural establishment for whom they are providing services.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-450, filed 5/31/88, effective 7/1/88; 85-24-032 (Order 85-33), § 296-17-450, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-450, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-450, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-450, filed 11/29/82, effective 1/1/83. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 78-12-043 (Order 78-23), § 296-17-450, filed 11/27/78, effective 1/1/79; Order 74-40, § 296-17-450, filed 11/27/74, effective 1/1/75; Order 74-29, § 296-17-450, filed 5/29/74, effective 7/1/74; Order 73-22, § 296-17-450, filed 11/9/73, effective 1/1/74.]

WAC 296-17-455 Special temporary help classification interpretation. For the purposes of administering

the temporary help classifications 7104 through 7121, the term "temporary help" shall be given the same meaning as temporary service contractors defined in RCW 19.31.020(2) and shall mean any person, firm, association or corporation conducting a business which consists of employing individuals directly for the purpose of furnishing such individuals on a part-time or temporary help basis to others.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-455, filed 5/31/88, effective 7/1/88; 85-24-032 (Order 85-33), § 296-17-455, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-455, filed 2/28/85, effective 4/1/85.]

WAC 296-17-470 Penalty assessments for employers who fail to register under Title 51 RCW. (1) Any employer who has failed to secure payment of compensation for their workers covered under this title will be liable, subject to RCW 51.48.010, to a maximum penalty in a sum of five hundred dollars or in a sum double the amount of premiums due for the four quarters prior to securing payment of compensation under this title, whichever is greater, for the benefit of the medical aid fund.

(2) If an injury or occupational disease is sustained by a worker of an employer who has failed to secure payment of compensation under this title that employer may also be liable for the cost of such an injury or occupational disease at the time the claim for benefits is accepted by the department.

For the purposes of this section only the cost of such claim will be determined as follows:

The case reserve value shall be determined by the nature of the injury or occupational disease, the part of the body affected and other factors which will impact the cost, including but not limited to, age, education and work experience. The case reserve value will include actual costs paid to date and estimated future claim costs. No further adjustments or evaluations of the cost of the claim will be made for the purposes of this subsection after assessment for the cost of an injury or occupational disease is made by the department.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-470, filed 5/29/87, effective 7/1/87; 83-24-017 (Order 83-36), § 296-17-470, filed 11/30/83, effective 1/1/84. Statutory Authority: RCW 51.04.020(1). 83-05-019 (Order 83-5), § 296-17-470, filed 2/9/83.]

WAC 296-17-480 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-17-502 Classification 0102.

Concrete and asphalt construction, N.O.C. - including concrete sawing, drilling and pumping
Concrete construction in connection with wood frame building construction such as foundations, sidewalks, driveways, and curbs including the placement of incidental reinforcing steel.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-502, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-502, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-502, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-502, filed 11/30/83, effective 1/1/84; 82-

24-047 (Order 82-38), § 296-17-502, filed 11/29/82, effective 1/1/83; Order 76-36, § 296-17-502, filed 11/30/76; Order 73-22, § 296-17-502, filed 11/9/73, effective 1/1/74.]

WAC 296-17-505 Classification 0105.

Fence erection or repair—all types, N.O.C.
 Parking meter installation—report parking meter mechanism service or repair separately in risk classification 0606 (WAC 296-17-526), "vending or coin-operated machine service."
 Placement of wire mesh on slopes for slope protection.

[Statutory Authority: RCW 51.16.035. 87-24-060 (Order 87-26), § 296-17-505, filed 12/1/87, effective 1/1/88; 87-12-032 (Order 87-12), § 296-17-505, filed 5/29/87, effective 7/1/87; 86-12-041 (Order 86-18), § 296-17-505, filed 5/30/86, effective 7/1/86; 85-24-032 (Order 85-33), § 296-17-505, filed 11/27/85, effective 1/1/86; 83-24-017 (Order 83-36), § 296-17-505, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-505, filed 11/29/82, effective 1/1/83; Order 73-22, § 296-17-505, filed 11/9/73, effective 1/1/74.]

WAC 296-17-509 Classification 0202.

Diving operations and subaqueous work
 Pile driving or concrete piling construction
 Wharf, pier, dock and marine railway: Construction, maintenance, and repair.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-509, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-509, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-509, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-509, filed 11/30/83, effective 1/1/84; Order 76-36, § 296-17-509, filed 11/30/76; Order 73-22, § 296-17-509, filed 11/9/73, effective 1/1/74.]

WAC 296-17-50904 Classification 0206.

Commercial concrete construction such as but not limited to building foundations, sewage disposal plants, swimming pools, fish hatcheries, water purification plants construction, and similar concrete projects
 This classification will be used to report concrete construction projects other than concrete building construction reported in risk classification 0505; concrete construction done in connection with wood frame building construction reported in risk classification 0102; highway, street, and road construction projects reported in risk classification 0101; and bridge construction projects reported in risk classification 0201.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-50904, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-50904, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-50904, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-50904, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-50904, filed 11/29/82, effective 1/1/83.]

WAC 296-17-517 Classification 0502.

Rug, linoleum, tile and other types of floor or drain-board covering installation excluding hardwood floor installation rated under risk classification 0513.

[Statutory Authority: RCW 51.16.035. 87-24-060 (Order 87-26), § 296-17-517, filed 12/1/87, effective 1/1/88; 85-24-032 (Order 85-33), § 296-17-517, filed 11/27/85, effective 1/1/86; 83-24-017 (Order 83-36), § 296-17-517, filed 11/30/83, effective 1/1/84; Order

75-38, § 296-17-517, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-517, filed 11/9/73, effective 1/1/74.]

WAC 296-17-519 Classification 0504.

Wallboard taping and texturing, excluding wallboard installation rated under risk classification 0515 (WAC 296-17-52107)
 Painting bridges, including incidental preparation work
 Painting, decorating or paperhanging, N.O.C., including incidental preparation, including shop
 Waterproofing, N.O.C. excludes roofing or subaqueous work
 Painting, coating or cleaning oil or gas storage tanks and beer vats
 Painting towers, smokestacks and steel or iron structures.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-519, filed 5/31/88, effective 7/1/88; 85-24-032 (Order 85-33), § 296-17-519, filed 11/27/85, effective 1/1/86; 83-24-017 (Order 83-36), § 296-17-519, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-519, filed 11/29/82, effective 1/1/83; Order 76-36, § 296-17-519, filed 11/30/76; Order 73-22, § 296-17-519, filed 11/9/73, effective 1/1/74.]

WAC 296-17-520 Classification 0505.

Construction, alteration, or repair of buildings, N.O.C.:
 Concrete, iron, or steel
 Gutters: Installation, service or repair – on structures
 Plastering, stuccoing, and lathing, N.O.C.
 Elevator door bucks – installation
 Mobile home set up including installation of skirting and awnings by contractor. Excludes mobile home set up by mobile home dealers reported under risk classification 3401
 Fire escapes and awnings: Installation, alteration, repair, or removal – building exteriors
 Decorative metal shutters: Installation, repair or removal – no buntings
 Scaffolds, hod hoists, concrete and cement distributing towers, sidewalk bridges and construction elevators – installation or removal
 Debris cleaning and removal.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-520, filed 5/31/88, effective 7/1/88; 87-24-060 (Order 87-26), § 296-17-520, filed 12/1/87, effective 1/1/88; 87-12-032 (Order 87-12), § 296-17-520, filed 5/29/87, effective 7/1/87; 86-12-041 (Order 86-18), § 296-17-520, filed 5/30/86, effective 7/1/86; 85-24-032 (Order 85-33), § 296-17-520, filed 11/27/85, effective 1/1/86; 85-12-024 (Order 85-11), § 296-17-520, filed 5/31/85; 83-24-017 (Order 83-36), § 296-17-520, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-520, filed 11/29/82, effective 1/1/83; Order 76-36, § 296-17-520, filed 11/30/76; Order 75-38, § 296-17-520, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-520, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-520, filed 11/9/73, effective 1/1/74.]

WAC 296-17-52102 Classification 0510.

Wood frame building construction, alteration, or repair, N.O.C.
 For the purposes of this rule wood frame building construction means buildings erected exclusively of wood or wood products.

This classification includes all building framing activities done in connection with wood frame building construction including the placement of roof trusses, sheathing roofs, installation of exterior building siding, and installation of exterior doors and door frames whether performed by a general or specialty contractor.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-52102, filed 5/31/88, effective 7/1/88; 87-12-032 (Order 87-12), § 296-17-52102, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-52102, filed 11/27/85, effective 1/1/86.]

WAC 296-17-52104 Classification 0512.

Insulation or sound proofing materials installation, N.O.C.

This classification includes installation of weather strip and caulking, roof or soffit ventilators, energy efficient doors and related carpentry work done in connection with the weatherization or retrofitting of buildings and residences. Report installation of windows separately in risk classification 0511 (WAC 296-17-52103) "glass installation—buildings" and energy auditors with no installation or delivery duties separately in risk classification 6303 (WAC 296-17-698) "outside sales—estimators."

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-52104, filed 5/29/87, effective 7/1/87; 86-12-041 (Order 86-18), § 296-17-52104, filed 5/30/86, effective 7/1/86.]

WAC 296-17-52105 Classification 0513.

Interior finish carpentry.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-52105, filed 5/29/87, effective 7/1/87.]

WAC 296-17-52106 Classification 0514.

Garage or overhead door installation including automatic door openers when installed with a garage or overhead door.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-52106, filed 5/31/88, effective 7/1/88.]

WAC 296-17-52107 Classification 0515.

Wallboard installation

This classification excludes taping and texturing work which is to be reported separately in risk classification 0504 "wallboard taping and texturing."

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-52107, filed 5/31/88, effective 7/1/88.]

WAC 296-17-52108 Classification 0516.

Carpentry, N.O.C.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-52108, filed 5/31/88, effective 7/1/88.]

WAC 296-17-526 Classification 0606.

Amusement devices, N.O.C.: Installation, service, repair, and removal – coin-operated in stores and shopping malls

Fire extinguisher sales and service

Vending or coin-operated machines, operation, installation maintenance and service, includes product preparation by vending company

This classification excludes honor snack food services which will be reported under risk classification 1101 driver delivery sales, provided that in the event such an operation is conducted as a part of and in connection with an operation rated in this classification (0606), risk classification 0606 will be assigned to cover both operations.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-526, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-526, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-526, filed 2/28/85, effective 4/1/85; Order 73-22, § 296-17-526, filed 11/9/73, effective 1/1/74.]

WAC 296-17-527 Classification 0607.

Advertising display service for stores within buildings

Dead bolt installation – new construction by locksmith

Drapes or curtain installation

Household appliances electrical installation, service and repair

Meat slicer or grinder installation, service and repair

Safes and vaults, installation and removal

Television antenna or satellite disc installation and repair

Venetian blinds and shades, installation

This classification will include installation, service and repair of radio and television receiving sets, two-way radio, car stereo systems and radio-television repair.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-527, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-527, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-527, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-527, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-527, filed 11/29/82, effective 1/1/83; Order 73-22, § 296-17-527, filed 11/9/73, effective 1/1/74.]

WAC 296-17-52701 Classification 0608.

Business machine and computer mini and mainframe systems.

Report the installation of personal desk top computer systems separately in risk classification 4107.

Electrical alarm systems including smoke alarms

Intercom or audio call box

Telecommunication and PBX or similar equipment

Telephone service prewire by contractor

This classification includes installation, service or repair of the above types of equipment and includes all shop or yard operations.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-52701, filed 5/31/88, effective 7/1/88; 87-24-060 (Order 87-26), § 296-17-52701, filed 12/1/87, effective 1/1/88; 85-24-032 (Order 85-33), § 296-17-52701, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-52701, filed 2/28/85, effective 4/1/85.]

WAC 296-17-536 Classification 1101.

Armoured car service

Automobile delivery drive away, automobile repossessing

Computer tape/accounting records delivery service

Delivery by retail, wholesale, combined wholesale and retail stores and distributors, N.O.C.

Delivery companies, deliver parcels and packages, no bulk merchandise

Distribution of sample merchandise by vehicle

Driver delivery sales, N.O.C.

Drivers of sound trucks

News agents or distributors of magazines, periodicals and telephone books, no retail dealer

Route food services, excludes food preparation to be reported under risk classification 3905 (WAC 296-17-618)

Septic tank and cesspool cleaning, excludes installation or repair

Street sweeping, parking lot sweeping, portable chemical toilets servicing

Street vending vehicles.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-536, filed 5/31/88, effective 7/1/88; 86-12-041 (Order 86-18), § 296-17-536, filed 5/30/86, effective 7/1/86; 85-24-032 (Order 85-33), § 296-17-536, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-536, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-536, filed 11/30/83, effective 1/1/84; 81-24-042 (Order 81-30), § 296-17-536, filed 11/30/81, effective 1/1/82; Order 77-27, § 296-17-536, filed 11/30/77, effective 1/1/78; Order 75-38, § 296-17-536, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-536, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-536, filed 11/9/73, effective 1/1/74.]

WAC 296-17-538 Classification 1103.

Coal merchants, solid fuel yards, firewood dealers, excludes operations subject to risk classification 1004 (WAC 296-17-53501), risk classification 1702 (WAC 296-17-549), risk classification 1703 (WAC 296-17-550), risk classification 5001 (WAC 296-17-659)

Lumber yards, building material dealers, not done in connection with or incidental to a manufacturing or processing plant operation also excluding yard operations rated under risk classification 1002 (WAC 296-17-534.)

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-538, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-538, filed 11/27/85, effective 1/1/86; 83-24-017 (Order 83-36), § 296-17-538, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-538, filed 11/29/82, effective 1/1/83; Order 73-22, § 296-17-538, filed 11/9/73, effective 1/1/74.]

WAC 296-17-53806 Classification 1109.

Auto or truck towing companies.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-53806, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-53806, filed 11/27/85, effective 1/1/86.]

WAC 296-17-542 Classification 1401.

Taxicab companies.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-542, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-542, filed 11/27/85, effective 1/1/86; 83-24-017 (Order 83-36), § 296-17-542, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-542, filed 11/29/82, effective 1/1/83; Order 73-22, § 296-17-542, filed 11/9/73, effective 1/1/74.]

WAC 296-17-544 Classification 1404.

Bus or limousine companies, transit systems, contract bus driving

Chauffeurs, N.O.C.

Equipment escort and pilot car service

Vessels, ferries, tugs and steamboats operation, N.O.C. including dock employees - excluding maritime.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-544, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-544, filed 11/27/85, effective 1/1/86; 83-24-017 (Order 83-36), § 296-17-544, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-544, filed 11/29/82, effective 1/1/83; Order 73-22, § 296-17-544, filed 11/9/73, effective 1/1/74.]

WAC 296-17-54401 Classification 1405.

Ambulance services including mobile medic and patient transport services.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-54401, filed 5/29/87, effective 7/1/87.]

WAC 296-17-552 Classification 1801.

Blast furnace operation

Lead manufacturing - red or white

Lead works - sheet, tinfoil manufacturing

Recovering, refining, or reprocessing metals

Rolling mills steel or iron, rolling mills, N.O.C.

Smelting, sintering or refining lead, manufacturing calcium carbide

Smelting, sintering or refining ores, N.O.C.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-552, filed 5/31/88, effective 7/1/88; 85-24-032 (Order 85-33), § 296-17-552, filed 11/27/85, effective 1/1/86; Order 73-22, § 296-17-552, filed 11/9/73, effective 1/1/74.]

WAC 296-17-55201 Classification 1802.

Aluminum smelting: Primary smelting of aluminum from alumina using an electrolytic reduction process.

This classification includes the alloying and casting of sheet ingots, T-ingots, rolling ingots, notched ingots, sows, pigs, extrusion logs, extrusion billets, and other primary production shapes when performed by a primary producer subject to this classification.

This classification excludes secondary processors who do not reduce aluminum from alumina, but whose principle business is casting, rolling, extruding, foiling, or recycling aluminum and aluminum alloys from molten aluminum, primary production shapes or used scrap and dross which are reported separately in Risk Classification 1801.

[Statutory Authority: RCW 51.16.035. 88-06-047 (Order 87-33), § 296-17-55201, filed 3/1/88.]

WAC 296-17-562 Classification 2101.

Grain milling, feed mills, feed manufacture, including preparation of cereal or compound feeds for livestock

Farm supply stores

Flour mills

Hay, grain or feed dealers

Seed merchants including operation of seed sorting machinery.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-562, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-562, filed 11/27/85, effective 1/1/86; Order 73-22, § 296-17-562, filed 11/9/73, effective 1/1/74.]

WAC 296-17-563 Classification 2102.

Grocery, fruit or produce distributors, wholesale or combined wholesale and retail. Drivers will be separately rated under risk classification 1101 (WAC 296-17-536) delivery by combined wholesale and retail stores

Recycle, collection and receiving stations, and dealers of rags, bottles, paper and metal containers, N.O.C., no junk dealers. Drivers will be separately rated under risk classification 1102 (WAC 296-17-537) trucking, N.O.C.

Warehouses - general merchandise. Wholesale dealers to be separately rated. Drivers will be separately rated under risk classification 1102 (WAC 296-17-537) trucking, N.O.C.

Wool or cotton merchants. Drivers will be separately rated under risk classification 1102 (WAC 296-17-537) trucking, N.O.C.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-563, filed 5/31/88, effective 7/1/88; 85-24-032 (Order 85-33), § 296-17-563, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-563, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-563, filed 11/30/83, effective 1/1/84; 81-24-042 (Order 81-30), § 296-17-563, filed 11/30/81, effective 1/1/82; 80-17-016 (Order 80-23), § 296-17-563, filed 11/13/80, effective 1/1/81; Order 77-27, § 296-17-563, filed 11/30/77, effective 1/1/78; Order 75-38, § 296-17-563, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-563, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-563, filed 11/9/73, effective 1/1/74.]

WAC 296-17-56402 Classification 2106.

Anhydrous ammonia, fertilizer, and agricultural chemical dealers including mixing of chemicals.

This classification does not apply to the production of raw materials for use in the manufacture of the above products.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-56402, filed 5/31/88, effective 7/1/88.]

WAC 296-17-565 Classification 2201.

Laundries and dry cleaning establishments all operations including drop off stations operated by such establishments

Cleaning and dyeing

This classification is limited to establishments providing services primarily to retail walk in customers.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-565, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-565, filed 11/27/85, effective 1/1/86; 83-24-017 (Order 83-36), § 296-17-565, filed 11/30/83, effective 1/1/84; Order 73-22, § 296-17-565, filed 11/9/73, effective 1/1/74.]

WAC 296-17-566 Classification 2202.

Carpet, rug and upholstery cleaning, shop or outside.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-566, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-

33), § 296-17-566, filed 11/27/85, effective 1/1/86; 83-24-017 (Order 83-36), § 296-17-566, filed 11/30/83, effective 1/1/84; Order 73-22, § 296-17-566, filed 11/9/73, effective 1/1/74.]

WAC 296-17-56601 Classification 2203.

Laundries - commercial or industrial, N.O.C., including linen, uniform and diaper service.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-56601, filed 5/29/87, effective 7/1/87.]

WAC 296-17-567 Classification 2401.

Paper or pulp manufacturing, wood fibre manufacturing
Corrugated and fibre board container manufacturing, including corrugating and laminating of paper
Paper coating, corrugating, laminating or oiling
Paper goods, N.O.C., manufacturing
Building and roofing paper including felt, manufacturing.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-567, filed 5/31/88, effective 7/1/88; 87-24-060 (Order 87-26), § 296-17-567, filed 12/1/87, effective 1/1/88; 85-24-032 (Order 85-33), § 296-17-567, filed 11/27/85, effective 1/1/86. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-567, filed 11/30/79, effective 1/1/80; Order 77-27, § 296-17-567, filed 11/30/77, effective 1/1/78; Order 73-22, § 296-17-567, filed 11/9/73, effective 1/1/74.]

WAC 296-17-568 Classification 2903.

Box, shoo, pallet, bin manufacturing, assembly or repair - wood

Door, jamb, window, sash, stair, molding and miscellaneous millwork manufacturing, prehanging or assembly - wood

Furniture stock manufacturing - wood

Lumber remanufacturing

Sign manufacturing - wood

Truss manufacturing - wood

Veneer products manufacturing

Wood chip, hog fuel, bark, bark flour, presto log and lath manufacturing

Wood products manufacturing or assembly N.O.C.

Sawmill operations to be reported separately under risk classification 1002. Veneer manufacturing to be reported separately under risk classification 2904

This is a shop or plant only classification but does contemplate work being performed in an adjacent yard when operated by an employer having operations subject to this classification. This classification excludes all activities away from the shop or plant.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-568, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-568, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-568, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-568, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-568, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-568, filed 11/30/81, effective 1/1/82; Order 76-36, § 296-17-568, filed 11/30/76; Order 75-38, § 296-17-568, filed 11/24/75, effective 1/1/76; Order 75-28, § 296-17-568, filed 8/29/75, effective 10/1/75; Order 73-22, § 296-17-568, filed 11/9/73, effective 1/1/74.]

WAC 296-17-56901 Classification 2905.

Furniture and casket manufacturing or assembly - wood

Furniture refinishing including repair – wood
Furniture refinishing with no repair work is to be reported separately under risk classification 3603

Physically separated upholstery departments of firms engaged in furniture or casket manufacturing, assembly or finishing may be reported separately under risk classification 3808, and in accordance with WAC 296-17-410

This is a shop or plant only classification but does contemplate work being performed in an adjacent yard when operated by an employer having operations subject to this classification. This classification excludes all activities away from the shop or plant.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-56901, filed 5/29/87, effective 7/1/87.]

WAC 296-17-57001 Classification 2907.

Cabinet, countertop, and fixture manufacturing, modifying or assembly – wood

This is a shop or plant only classification but does contemplate work being performed in an adjacent yard when operated by an employer having operations subject to this classification. This classification excludes all activities away from the shop or plant.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-57001, filed 5/29/87, effective 7/1/87.]

WAC 296-17-57003 Classification 2909.

Woodenware: Household and sporting goods manufacturing or assembly, N.O.C.

This classification excludes wood products manufacturing or assembly reported under risk classifications 2903, 2905, and 2907

This is a shop or plant only classification but does contemplate work being performed in an adjacent yard when operated by an employer having operations subject to this classification. This classification excludes all activities away from the shop or plant.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-57003, filed 5/29/87, effective 7/1/87.]

WAC 296-17-57601 Classification 3302.

Meat, fish and poultry dealers, wholesale or combined wholesale/retail

This classification is limited to employers engaged in selling fresh meat, fish and poultry who are not engaged in slaughter or packing house operation which are rated subject to risk classification 4301 (WAC 296-17-630).

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-57601, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-57601, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-57601, filed 2/28/85, effective 4/1/85. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 78-12-043 (Order 78-23), § 296-17-57601, filed 11/27/78, effective 1/1/79.]

WAC 296-17-57602 Classification 3303.

Meat, fish and poultry dealers, retail

This classification is limited to employers engaged in selling fresh meats, fish and poultry over the counter,

by the pound to a retail consumer and who maintain show cases displaying fresh cuts of meat, fish and poultry available for sale by the pound to such consumers

This classification excludes custom meat cutting facilities licensed under chapter 16.49 RCW who are prohibited by law from selling fresh meat, fish and poultry by the pound to a retail customer which are subject to risk classification 4302 (WAC 296-17-631).

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-57602, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-57602, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-57602, filed 2/28/85, effective 4/1/85. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 78-12-043 (Order 78-23), § 296-17-57602, filed 11/27/78, effective 1/1/79.]

WAC 296-17-578 Classification 3309.

Motorcycle, moped, motor scooter, snowmobile, jet ski, go-carts, golf cars, all terrain vehicles, or other similar motorized vehicles sales and rental agencies including parts and service departments.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-578, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-578, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-578, filed 2/28/85, effective 4/1/85; Order 73-22, § 296-17-578, filed 11/9/73, effective 1/1/74.]

WAC 296-17-579 Classification 3401.

Automobile, truck, body and fender repair shops, including painting and incidental upholstery and glass repair

Automobile, truck, mobile home, camper, and trailer sales and/or rental agency, including repair shops and canopy sales and installation by dealers subject to this classification

Automobile, truck, repair shops or garages

Automobile, truck service specialty shops including sales, installation and repair of air conditioning systems, electrical systems, cruise controls, mufflers, and sun roofs

Boat dealers, including repair shops

Marinas and boat house operations, including repair shops

This classification will include mobile home delivery and set up when done by employees of the mobile home sales agency. Contractors doing set up and delivery of mobile homes who are not employees of the mobile home sales agency will be rated under risk classification 0505 (WAC 296-17-520).

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-579, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-579, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-579, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-579, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-579, filed 11/29/82, effective 1/1/83; Order 75-38, § 296-17-579, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-579, filed 11/9/73, effective 1/1/74.]

WAC 296-17-580 Classification 3402.

Abrasive wheel manufacturing

Air compressor manufacturing or assembly, elevator manufacturing, gear grinding or manufacturing
 Automobile or truck, radiator and heater core manufacturing and repair shops
 Auto body manufacturing – truck, trailer, bus body manufacturing, travel trailer body repair
 Auto or motorcycle manufacturing or assembly
 Auto or truck engine manufacturing, aircraft engine manufacturing or rebuild, N.O.C.
 Auto or truck parts, machining or rebuild not in vehicle
 Battery manufacturing or assembly including repair
 Bed spring or wire mattress manufacturing
 Confectioners machinery manufacturing or assembly, food processing machinery manufacturing or assembly, precision machined parts, N.O.C., manufacturing
 Coppersmithing, shop
 Furnace, heater or radiator manufacturing
 Heat treating metal
 Lead burning, metal spraying – copper
 Machinery manufacturing or assembly, N.O.C.
 Machine shops, N.O.C., including mobile shops, tool sharpening and marine engine repair
 Nut, bolt, screw, nail, tack, rivet, eyelet, spike and needle manufacturing, N.O.C.
 Office machinery manufacturing or assembly, N.O.C., cash register and sewing machine manufacturing or assembly
 Photo processing machinery manufacturing or assembly
 Power saw, lawn and garden equipment and small motor repair, N.O.C.
 Printing or bookbinding machinery manufacturing or assembly
 Pump manufacturing or assembly, safe manufacturing or assembly, scale manufacturing or assembly including repair, auto jack manufacturing or assembly, water meter manufacturing or assembly including repair
 Saw manufacturing or assembly
 Sewing machine, commercial – repair and rebuild
 Shoe machinery manufacturing or assembly, sprinkler head manufacturing or assembly, textile machinery manufacturing or assembly
 Small arms, speedometer and carburetor manufacturing or assembly including rebuild
 Tool manufacturing, machine finishing
 Tool manufacturing, not hot forming or stamping, die manufacturing – ferrous
 Valve manufacturing
 Welding or cutting, N.O.C. including mobile operations
 This is a shop or plant only classification but does contemplate work being performed in an adjacent yard when operated by an employer having operations subject to this classification. Unless outside activities are specifically provided for they are to be separately rated
 This classification includes the repair of items being manufactured or assembled when done by employees of an employer having operations rated within this classification when the repair is done as a part of and in connection with the manufacturing or assembly operation.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-580, filed 5/31/88, effective 7/1/88; 85-24-032 (Order 85-33), § 296-17-580, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-580, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-580, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-580, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-580, filed 11/30/81, effective 1/1/82. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-580, filed 11/30/79, effective 1/1/80; Order 76-36, § 296-17-580, filed 11/30/76; Order 75-38, § 296-17-580, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-580, filed 11/9/73, effective 1/1/74.]

WAC 296-17-582 Classification 3404.

Aluminum ware manufacturing – from sheet aluminum
 Auto or truck parts manufacturing or assembly N.O.C. – miscellaneous stamped parts
 Awning manufacturing or assembly – metal
 Brass or copper goods manufacturing
 Cans manufacturing – aluminum or galvanized
 Coffin-casket manufacturing or assembly, other than wood
 Electric or gas lighting fixtures, lampshades or lantern manufacturing or assembly – metal
 Furniture, shower-door, showcases – not wood – manufacturing or assembly
 Galvanized iron works, manufacturing – not structural
 Hardware manufacturing, N.O.C.
 Metal goods manufacturing, N.O.C., from material lighter than 9 gauge
 Metal stamping, including plating and polishing
 Sign manufacturing – metal
 Ski manufacturing and toboggan manufacturing other than wood
 Stove manufacturing, excluding wood stove manufacturing and other stoves made from material 9 gauge or heavier rated under risk classification 5209 (WAC 296-17-67602)
 Water heater manufacturing or assembly
 Window, sash or door manufacturing or assembly – aluminum
 Physically separate upholstery departments of firms engaged in furniture, coffin or casket manufacturing, assembly, or finishing may be separately rated under risk classification 3808 (WAC 296-17-612), and in accordance with WAC 296-17-410
 This is a shop or plant only classification but does contemplate work being performed in an adjacent yard when operated by an employer having operations subject to this classification. Unless outside activities are specifically provided for they are to be separately rated
 This classification includes the repair of items being manufactured or assembled when done by employees of an employer having operations rated in this classification when the repair is done as a part of and in connection with the manufacturing or assembly operation.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-582, filed 5/31/88, effective 7/1/88; 87-24-060 (Order 87-26), § 296-17-582, filed 12/1/87, effective 1/1/88; 85-24-032 (Order 85-33), § 296-17-582, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-582, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-582, filed 11/30/83, effective

1/1/84; 81-24-042 (Order 81-30), § 296-17-582, filed 11/30/81, effective 1/1/82; 80-17-016 (Order 80-23), § 296-17-582, filed 11/13/80, effective 1/1/81; Order 75-38, § 296-17-582, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-582, filed 11/9/73, effective 1/1/74.]

WAC 296-17-594 Classification 3602.

Camera manufacturing or assembly including repair in shop

Dental laboratories

Electric cordset radio and ignition assembly

Electronic circuit board assembly, N.O.C.

Electronic products manufacturing; resistors, capacitors, chip and relays manufacturing

Fishing tackle manufacturing, N.O.C., including assembly

Incandescent lamp manufacturing, electric tube or transistor manufacturing

Instrument manufacturing, scientific, medical or professional

Jewelry manufacturing or engraving

Magnetic tape manufacturing

Motion picture projectors manufacturing or assembly including repair in shop

Silverware manufacturing, watch case manufacturing

Sound recording equipment, thermometer and steam gauge manufacturing

Stereo components manufacturing or assembly

Tag, button, zipper or fastener manufacturing, bottle cap manufacturing

Telegraph or radio apparatus manufacturing, N.O.C.

Telephone set manufacturing or repair, N.O.C.

Trophy engraving

Watch manufacturing

This is a shop or plant only classification although the classification allows for repair work when specified it is contemplated that such repairs are limited to those brought into the shop by the customer or sent through a common carrier. This classification excludes all outside repair work

This classification does not apply to the production of raw material for use in the manufacturing of the above articles.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-594, filed 5/31/88, effective 7/1/88; 85-24-032 (Order 85-33), § 296-17-594, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-594, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-594, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-594, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-594, filed 11/30/81, effective 1/1/82; 80-17-016 (Order 80-23), § 296-17-594, filed 11/13/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-594, filed 11/30/79, effective 1/1/80; Order 75-38, § 296-17-594, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-594, filed 11/9/73, effective 1/1/74.]

WAC 296-17-598 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-17-600 Classification 3702.

Breweries or malt houses

Bottling - beverages, N.O.C.

Spiritous liquor manufacturing

Wine making

Yeast manufacturing

This classification includes tour guides and tasting room employees.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-600, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-600, filed 11/27/85, effective 1/1/86; 83-24-017 (Order 83-36), § 296-17-600, filed 11/30/83, effective 1/1/84; Order 73-22, § 296-17-600, filed 11/9/73, effective 1/1/74.]

WAC 296-17-603 Classification 3707.

Rubber boot manufacturing, rubber goods manufacturing, N.O.C.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-603, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-603, filed 11/27/85, effective 1/1/86; Order 75-38, § 296-17-603, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-603, filed 11/9/73, effective 1/1/74.]

WAC 296-17-604 Classification 3708.

Linoleum, oil cloth or imitation leather manufacturing

Broom and brush manufacturing, or assembly

Cordage, rope or twine manufacturing

Match manufacturing

Cotton cord or cotton twine manufacturing

Textile manufacturing, N.O.C.

Taxidermists and hide pelting

Parachutes, suspenders, fur goods and bandages manufacturing

Nylon or synthetic goods manufacturing, N.O.C.

Life preservers and canvas goods manufacturing, N.O.C.

Braid, net, plush and velvet, thread, webbing and yarn manufacturing

Spinning or weaving - natural or synthetic fibres, N.O.C.

Pillow, quilt or cushion manufacturing including stuffed animal or doll manufacturing

Mattress or box springs manufacturing - no manufacturing wire springs or excelsior

Abrasive cloth preparation

Bag or sack manufacturing or renovating - cotton, bur-lap, gunny, nylon, or textile

Carpet or rug manufacturing

Fire hose manufacturing from linen thread

Cotton batting, wadding or waste manufacturing

Wool combing or scouring

Fishing rod wrappings, manufacturing

Awning, tent, sail, flags, wind socks or sleeping bag manufacturing.

[Statutory Authority: RCW 51.16.035. 87-24-060 (Order 87-26), § 296-17-604, filed 12/1/87, effective 1/1/88; 85-24-032 (Order 85-33), § 296-17-604, filed 11/27/85, effective 1/1/86; 83-24-017 (Order 83-36), § 296-17-604, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-604, filed 11/29/82, effective 1/1/83; Order 73-22, § 296-17-604, filed 11/9/73, effective 1/1/74.]

WAC 296-17-612 Classification 3808.

Upholstery work, N.O.C.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-612, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-

33), § 296-17-612, filed 11/27/85, effective 1/1/86. Statutory Authority: RCW 51.04.020(1), 83-05-019 (Order 83-5), § 296-17-612, filed 2/9/83; Order 75-28, § 296-17-612, filed 8/29/75, effective 10/1/75; Order 73-22, § 296-17-612, filed 11/9/73, effective 1/1/74.]

WAC 296-17-615 Classification 3902.

Fruit and vegetable cannery and freezer operations
 Fruit and vegetable evaporating, preserving or dehydrating
 Fruit syrup manufacturing, fruit juice manufacturing, jam or jelly manufacturing, cider manufacturing
 Pea vining
 Corn products, chocolate and cocoa manufacturing
 Baking powder, dextrine, glucose, and starch manufacturing
 Nut shelling, egg breaking, coconut shredding and peanut handling
 Food sundries manufacturing and food processing, N.O.C.
 Peanut butter, honey, mayonnaise and instant potato manufacturing
 Pickle manufacturing, sauerkraut manufacturing
 Pet food manufacturing
 Butter substitutes manufacturing
 Breakfast food manufacturing
 Poultry canning and canneries, N.O.C.
 Vegetable oil manufacturing.

[Statutory Authority: RCW 51.16.035, 87-12-032 (Order 87-12), § 296-17-615, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-615, filed 11/27/85, effective 1/1/86; 83-24-017 (Order 83-36), § 296-17-615, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-615, filed 11/29/82, effective 1/1/83; Order 75-38, § 296-17-615, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-615, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-615, filed 11/9/73, effective 1/1/74.]

WAC 296-17-619 Classification 4002.

Creameries or milk and milk products processing including butter, cheese, ice cream, ice cream mix, and condensed milk
 This classification does not include dairy or farming operations subject to risk classification 7301 (WAC 296-17-644).

[Statutory Authority: RCW 51.16.035, 87-12-032 (Order 87-12), § 296-17-619, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-619, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-619, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-619, filed 11/30/83, effective 1/1/84; Order 73-22, § 296-17-619, filed 11/9/73, effective 1/1/74.]

WAC 296-17-620 Classification 4101.

Printing, lithography, engraving, map printing, and silk screening, N.O.C.
 Rubber stamp manufacturing and assembling
 Bookbinding
 This classification excludes photographic composition or prepress work such as photographic or computerized typesetting, layout, paste up, editing and proofreading, camera work and platemaking which will be reported in risk classification 4904
 Any employee involved in printing operations subject to this classification will be reported in risk classification

4101 without division of hours.

[Statutory Authority: RCW 51.16.035, 87-12-032 (Order 87-12), § 296-17-620, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-620, filed 11/27/85, effective 1/1/86; 83-24-017 (Order 83-36), § 296-17-620, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-620, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-620, filed 11/30/81, effective 1/1/82. Statutory Authority: RCW 51.04.030 and 51.16.035, 79-12-086 (Order 79-18), § 296-17-620, filed 11/30/79, effective 1/1/80; Order 75-38, § 296-17-620, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-620, filed 11/9/73, effective 1/1/74.]

WAC 296-17-622 Classification 4103.

Newspaper publishing
 This classification excludes photographic composition or prepress work such as photographic or computerized typesetting, layout, paste up, editing and proofreading, camera work and plate making which will be reported in risk classification 4904
 Any employee involved in printing operations subject to this classification will be reported in risk classification 4103 without division of hours
 Outside reporters, advertising or circulation solicitors and photographers with no other duties will be rated under risk classification 6303 (WAC 296-17-698)
 Newspaper publishers with no printing operations will be governed by WAC 296-17-44001, business described by a standard exception classification.

[Statutory Authority: RCW 51.16.035, 87-12-032 (Order 87-12), § 296-17-622, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-622, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-622, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-622, filed 11/30/83, effective 1/1/84; Order 75-38, § 296-17-622, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-622, filed 11/9/73, effective 1/1/74.]

WAC 296-17-630 Classification 4301.

Glue manufacturing
 Lard making or refining
 Meat products manufacturing, including canning or dehydrating
 Packing house - including butchering and handling livestock
 Peat moss shredding and baling
 Rendering works, N.O.C.
 Sausage casings, wholesale dealer
 Sausage manufacturing
 Slaughter houses
 Tallow making
 Tanneries, fur manufacturing.

[Statutory Authority: RCW 51.16.035, 88-12-050 (Order 88-06), § 296-17-630, filed 5/31/88, effective 7/1/88; 85-24-032 (Order 85-33), § 296-17-630, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-630, filed 2/28/85, effective 4/1/85. Statutory Authority: RCW 51.04.020(1) and 51.16.035, 78-12-043 (Order 78-23), § 296-17-630, filed 11/27/78, effective 1/1/79; Order 76-36, § 296-17-630, filed 11/30/76; Order 75-38, § 296-17-630, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-630, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-630, filed 11/9/73, effective 1/1/74.]

WAC 296-17-643 Classification 4802.

Berry farms
 Bulb raising

Field vegetable crops, such as bush beans, peas, sweet corn, potatoes, sugar beets, and field carrots which are mechanically harvested

Flower seed growing including harvesting of seeds

Picking of forest products, N.O.C.

Vineyards including harvesting of fruit

This classification excludes fresh fruit packing operations rated under risk classification 2104 (WAC 296-17-564); and fruit cannery or freezer operations rated under risk classification 3902 (WAC 296-17-615) unless specifically included by manual language.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-643, filed 5/31/88, effective 7/1/88; 87-12-032 (Order 87-12), § 296-17-643, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-643, filed 11/27/85, effective 1/1/86; 85-12-024 (Order 85-11), § 296-17-643, filed 5/31/85; 85-06-026 (Order 85-7), § 296-17-643, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-643, filed 11/30/83, effective 1/1/84; Order 77-27, § 296-17-643, filed 11/30/77, effective 1/1/78; Order 75-38, § 296-17-643, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-643, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-643, filed 11/9/73, effective 1/1/74.]

WAC 296-17-644 Classification 4803.

Farms, N.O.C.

Orchards - applies to all tree crops, deciduous and fruits, nuts, and shall include all acreage devoted to the raising of such crops

This classification includes operations incidental to the enterprises described above including harvesting of all crops. However; ground hand picking of prunes and nuts will be separately rated under risk classification 4806 (WAC 296-17-647) if the conditions stipulated in that risk classification are met

This classification excludes fresh fruit packing operations rated under risk classification 2104 (WAC 296-17-564); and fruit cannery or freezer operations or nut processing rated under risk classification 3902 (WAC 296-17-615).

[Statutory Authority: RCW 51.16.035. 87-24-060 (Order 87-26), § 296-17-644, filed 12/1/87, effective 1/1/88; 85-24-032 (Order 85-33), § 296-17-644, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-644, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-644, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-644, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-644, filed 11/30/81, effective 1/1/82; Order 75-38, § 296-17-644, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-644, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-644, filed 11/9/73, effective 1/1/74.]

WAC 296-17-649 Classification 4808.

Alfalfa and clover seed growing

Field crops, N.O.C., including raising of all hay, and cereal grains

Potato sorting and storage, N.O.C.

This classification applies to all operations incidental to the enterprises described above

This classification excludes grain milling operations rated under risk classification 2101 (WAC 296-17-562); fresh vegetable packing operations rated under risk classification 2104 (WAC 296-17-564); and vegetable cannery or freezer operations rated under risk classification 3902 (WAC 296-17-615).

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-649, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-649, filed 11/27/85, effective 1/1/86; 85-12-024 (Order 85-11), § 296-17-649, filed 5/31/85; 85-06-026 (Order 85-7), § 296-17-649, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-649, filed 11/30/83, effective 1/1/84; Order 75-38, § 296-17-649, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-649, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-649, filed 11/9/73, effective 1/1/74.]

WAC 296-17-64901 Classification 4809.

Greenhouses, N.O.C.

Flowers - field growing, excluding bulb raising rated in risk classification 4802 (WAC 296-17-643)

Mushroom raising and harvesting

Sprouts raising and harvesting

This classification excludes fresh vegetable packing operations rated under risk classification 2104 (WAC 296-17-564); and vegetable cannery or freezer operations rated under risk classification 3902 (WAC 296-17-615).

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-64901, filed 5/31/88, effective 7/1/88; 85-24-032 (Order 85-33), § 296-17-64901, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-64901, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-64901, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-64901, filed 11/29/82, effective 1/1/83. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 78-12-043 (Order 78-23), § 296-17-64901, filed 11/27/78, effective 1/1/79.]

WAC 296-17-64902 Classification 4810.

Farms - field vegetables, N.O.C. including truck gardening for fresh market. This classification includes all ground preparation, growing husbandry and hand harvesting with the aid of a hand held cutting device such as a paring or cutting knife used in the harvest of broccoli or cauliflower and by hand alone as in the case of cucumbers.

Separately report ground preparation, growing and harvesting of vegetable crops such as bush beans, peas, sweet corn, potatoes and field carrots which are mechanically harvested in risk classification 4802 (WAC 296-17-643) "farms: Vegetables - mechanically harvested"; fresh vegetable packing operations reported separately under risk classification 2104 (WAC 296-17-564); and vegetable cannery or freezer operations reported separately under risk classification 3902 (WAC 296-17-615).

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-64902, filed 5/31/88, effective 7/1/88; 87-24-060 (Order 87-26), § 296-17-64902, filed 12/1/87, effective 1/1/88; 86-12-041 (Order 86-18), § 296-17-64902, filed 5/30/86, effective 7/1/86; 85-24-032 (Order 85-33), § 296-17-64902, filed 11/27/85, effective 1/1/86.]

WAC 296-17-655 Classification 4906.

Institutions of higher education including clerical office and sales personnel.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-655, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-655, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-655, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-655, filed 11/30/83, effective 1/1/84; Order 73-22, § 296-17-655, filed 11/9/73, effective 1/1/74.]

WAC 296-17-677 Classification 5301.

Accounting or bookkeeping firms
 Computer software or word processing services
 Court reporting firms
 Credit bureaus
 Employment agencies
 Law firms
 Management analyst or consulting firms, N.O.C.
 Secretarial or telephone answering services
 Travel agencies
 This classification includes clerical office and sales personnel

Use of this classification is limited to employers engaged in such services being provided to the general public. This is a services only classification and does not include retailing or store operations, nor is this classification to be assigned to employers setting up separate business operation to manage other commonly owned or operated business undertakings unless coincidentally the other operations are also subject to this classification.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-677, filed 5/31/88, effective 7/1/88; 86-12-041 (Order 86-18), § 296-17-677, filed 5/30/86, effective 7/1/86; 85-24-032 (Order 85-33), § 296-17-677, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-677, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-677, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-677, filed 11/29/82, effective 1/1/83. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 78-12-043 (Order 78-23), § 296-17-677, filed 11/27/78, effective 1/1/79; Order 75-38, § 296-17-677, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-677, filed 11/9/73, effective 1/1/74.]

WAC 296-17-680 Classification 6103.

Athletic officials for amateur sports, N.O.C., such as umpires and referees
 Churches
 Day nurseries or child care centers
 Libraries, N.O.C.
 Museums, N.O.C.
 Schools, N.O.C. including dance, modeling, music and flight instructions classroom only
 Schools: Academic K-12
 Schools, trade or vocational
 Use of this classification is limited to clerical office, sales personnel and white collar professional employees
 See risk classification 6104 (WAC 296-17-681) for other operations.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-680, filed 5/31/88, effective 7/1/88; 87-12-032 (Order 87-12), § 296-17-680, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-680, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-680, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-680, filed 11/30/83, effective 1/1/84; Order 73-22, § 296-17-680, filed 11/9/73, effective 1/1/74.]

WAC 296-17-681 Classification 6104.

Churches
 Day nurseries or child care centers
 Libraries, N.O.C.
 Museums, N.O.C.

Schools, N.O.C. including dance, modeling, music
 Schools: Academic K-12
 Schools, trade or vocational
 All other employments, N.O.C.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-681, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-681, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-681, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-681, filed 11/30/83, effective 1/1/84; Order 73-22, § 296-17-681, filed 11/9/73, effective 1/1/74.]

WAC 296-17-686 Classification 6109.

Childbirth classes
 Chiropractors, N.O.C.
 Dental clinics, N.O.C.
 Dentists, N.O.C.
 Medical clinics, N.O.C.
 Naturopaths, N.O.C.
 Optometrists, N.O.C.
 Physical therapists, N.O.C.
 Physicians and surgeons, N.O.C.
 Psychologists and psychiatrists, N.O.C.
 This classification includes clerical office and sales personnel.

[Statutory Authority: RCW 51.16.035. 87-24-060 (Order 87-26), § 296-17-686, filed 12/1/87, effective 1/1/88; 87-12-032 (Order 87-12), § 296-17-686, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-686, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-686, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-686, filed 11/30/83, effective 1/1/84; 81-24-042 (Order 81-30), § 296-17-686, filed 11/30/81, effective 1/1/82; Order 73-22, § 296-17-686, filed 11/9/73, effective 1/1/74.]

WAC 296-17-689 Classification 6203.

Boys or girls clubs
 YMCA/YWCA institutions
 This classification includes clerical office and sales personnel and excludes camp operations.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-689, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-689, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-689, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-689, filed 11/30/83, effective 1/1/84; 81-24-042 (Order 81-30), § 296-17-689, filed 11/30/81, effective 1/1/82; Order 75-38, § 296-17-689, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-689, filed 11/9/73, effective 1/1/74.]

WAC 296-17-691 Classification 6205.

Clubs, N.O.C. such as but not limited to fraternal, home owners or social organizations
 This classification includes food and beverage operations.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-691, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-691, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-691, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-691, filed 11/30/83, effective 1/1/84; Order 73-22, § 296-17-691, filed 11/9/73, effective 1/1/74.]

WAC 296-17-692 Classification 6206.

Golf courses, N.O.C., excluding miniature golf and driving ranges which are to be reported separately in risk classification 6208 unless they are conducted in

connection with operations subject to this classification.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-692, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-692, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-692, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-692, filed 11/30/83, effective 1/1/84; Order 73-22, § 296-17-692, filed 11/9/73, effective 1/1/74.]

WAC 296-17-695 Classification 6209.

Camp grounds such as but not limited to church, recreational, or educational including incidental cottage or cabin rentals, boat concessions, grocery stores, and penny or video arcades

Dude ranches – excluding cattle ranches

Swimming pools – public

Trailer or mobile home parks

This classification includes food and beverage operations, clerical office and sales personnel physically located at the above facilities.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-695, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-695, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-695, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-695, filed 11/30/83, effective 1/1/84; 81-24-042 (Order 81-30), § 296-17-695, filed 11/30/81, effective 1/1/82; Order 76-36, § 296-17-695, filed 11/30/76; Order 73-22, § 296-17-695, filed 11/9/73, effective 1/1/74.]

WAC 296-17-704 Classification 6309.

Automobile, truck, motorcycle accessory or replacement parts stores, wholesale/retail – excluding repairs

Bicycle stores – wholesale/retail, including repairs

Custom picture or u-frame stores – wholesale/retail, including repairs

Electrical hardware dealers – wholesale/retail, excluding repairs

Garden supply stores – wholesale/retail, excluding repairs

Gun stores – wholesale/retail, including repairs

Hardware stores – wholesale/retail, excluding repairs

Locksmiths, including repairs but excluding installation of dead bolt locks or similar activities which will be separately reported in risk classification 0607

Stained art glass stores – wholesale/retail, excluding manufacturing

Wood stove and accessory stores – wholesale/retail excluding installations or repairs

This classification includes clerical office and sales personnel.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-704, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-704, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-704, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-704, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-704, filed 11/29/82, effective 1/1/83; Order 76-36, § 296-17-704, filed 11/30/76; Order 75-38, § 296-17-704, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-704, filed 11/9/73, effective 1/1/74.]

WAC 296-17-724 Classification 6602.

Janitorial service – excluding contract window cleaning
Janitors, N.O.C.

Pest control. This category applies to operations involved in the control and extermination of pests by the use of pesticides, rodenticides and fumigants

Portable cleaning and washing, N.O.C. – includes auto and truck washing, recreational vehicles and mobile homes. This category will include roof cleaning and washing of single story buildings, but only if the washing is not incidental to painting or roof repair

Swimming pool cleaning

Termite control. This category applies to operations involved in the control and extermination of termites and other wood-destroying pests or organisms by fumigation or spraying of poisonous insecticides. Does not include structural repair.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-724, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-724, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-724, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-724, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-724, filed 11/29/82, effective 1/1/83; Order 73-22, § 296-17-724, filed 11/9/73, effective 1/1/74.]

WAC 296-17-731 Classification 6609.

Parimutuel horse race tracks with an average daily attendance of six thousand or more. This classification is limited in scope to employees of trainers who come under the jurisdiction of the Washington horse racing commission and who become licensed subject to the Washington horse racing commission's rules and regulations. This classification covers all on or off track employments of employers subject to this classification including off season or prerace training activities. This classification includes such employments as assistant trainers, grooms, stable hands, and exercise riders. For purposes of this rule, jockeys will be considered exercise riders when employed by a trainer outside of scheduled race meets. A meet, as used in this section, shall be for the duration of the racing season as set for each track by the Washington state horse racing commission.

[Statutory Authority: RCW 51.16.035. 88-12-065 (Order 88-05), § 296-17-731, filed 5/31/88; 85-24-032 (Order 85-33), § 296-17-731, filed 11/27/85, effective 1/1/86; 81-24-042 (Order 81-30), § 296-17-731, filed 11/30/81, effective 1/1/82; 80-17-016 (Order 80-23), § 296-17-731, filed 11/13/80, effective 1/1/81; Order 73-22, § 296-17-731, filed 11/9/73, effective 1/1/74.]

WAC 296-17-73101 Classification 6610.

Parimutuel horse race tracks with an average daily attendance of more than three thousand but less than six thousand. This classification is limited in scope to employees of trainers who come under the jurisdiction of the Washington horse racing commission and who become licensed subject to the Washington horse racing commission's rules and regulations. This classification covers all on or off track employments of employers subject to this classification including off season or prerace training activities. This classification includes such employments as assistant trainers, grooms, stable hands, and exercise riders. For purposes of this rule, jockeys will be considered exercise

riders when employed by a trainer outside of scheduled race meets. A meet, as used in this section, shall be for the duration of the racing season as set for each track by the Washington state horse racing commission.

[Statutory Authority: RCW 51.16.035. 88-12-065 (Order 88-05), § 296-17-73101, filed 5/31/88.]

WAC 296-17-73102 Classification 6611.

Parimutuel horse race tracks with an average daily attendance of three thousand or less. This classification is limited in scope to employees of trainers who come under the jurisdiction of the Washington horse racing commission and who become licensed subject to the Washington horse racing commission's rules and regulations. This classification covers all on or off track employments of employers subject to this classification including off season or prerace training activities. This classification includes such employments as assistant trainers, grooms, stable hands, and exercise riders. For purposes of this rule, jockeys will be considered exercise riders when employed by a trainer outside of scheduled race meets. A meet, as used in this section, shall be for the duration of the racing season as set for each track by the Washington state horse racing commission.

[Statutory Authority: RCW 51.16.035. 88-12-065 (Order 88-05), § 296-17-73102, filed 5/31/88.]

WAC 296-17-73103 Classification 6612.

Parimutuel horse race tracks operated in connection with a local fair or celebration or at a bush track. This classification is limited in scope to employees of trainers who come under the jurisdiction of the Washington horse racing commission and who become licensed subject to the Washington horse racing commission's rules and regulations. This classification covers all on or off track employments of employers subject to this classification including off season or prerace training activities. This classification includes such employments as assistant trainers, grooms, stable hands, and exercise riders. For purposes of this rule, jockeys will be considered exercise riders when employed by a trainer outside of scheduled race meets. A meet, as used in this section, shall be for the duration of the racing season as set for each track by the Washington state horse racing commission.

[Statutory Authority: RCW 51.16.035. 88-12-065 (Order 88-05), § 296-17-73103, filed 5/31/88.]

WAC 296-17-73104 Classification 6613.

Parimutuel horse race activities, N.O.C. excluding jockeys. This classification is limited to activities where a licensed public trainer has no starts but engages workers and for the reporting of the annual minimum premium.

[Statutory Authority: RCW 51.16.035. 88-12-065 (Order 88-05), § 296-17-73104, filed 5/31/88.]

WAC 296-17-736 Classification 6705.

Excursions – outdoor recreational N.O.C., includes river rides, pack trains, hiking and mountaineering, and including camping operations incidental thereto
Ski facilities – includes all operations incidental to the operation of the skiing facility such as ski tows parking lots but excludes food service operations, hotel or motel operations, ski rental or ski sales shops
Ski instructors and ski patrols
Wind sail board instructors.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-736, filed 5/31/88, effective 7/1/88; 87-24-060 (Order 87-26), § 296-17-736, filed 12/1/87, effective 1/1/88; 85-24-032 (Order 85-33), § 296-17-736, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-736, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-736, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-736, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-736, filed 11/30/81, effective 1/1/82; 80-17-016 (Order 80-23), § 296-17-736, filed 11/13/80, effective 1/1/81; Order 77-27, § 296-17-736, filed 11/30/77, effective 1/1/78; Order 74-40, § 296-17-736, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-736, filed 11/9/73, effective 1/1/74.]

WAC 296-17-739 Classification 6708.

Jockeys
Professional racing drivers.

[Statutory Authority: RCW 51.16.035. 87-24-060 (Order 87-26), § 296-17-739, filed 12/1/87, effective 1/1/88; 85-24-032 (Order 85-33), § 296-17-739, filed 11/27/85, effective 1/1/86; Order 77-10, § 296-17-739, filed 5/31/77; Order 74-40, § 296-17-739, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-739, filed 11/9/73, effective 1/1/74.]

WAC 296-17-741 Classification 6801.

Airlines, scheduled
All members of the flying crew.

[Statutory Authority: RCW 51.16.035. 87-24-060 (Order 87-26), § 296-17-741, filed 12/1/87, effective 1/1/88; 85-24-032 (Order 85-33), § 296-17-741, filed 11/27/85, effective 1/1/86; Order 73-22, § 296-17-741, filed 11/9/73, effective 1/1/74.]

WAC 296-17-743 Classification 6803.

Aircraft operations, N.O.C. – all members of the flying crew
Flight instruction
Private aircraft – transportation of personnel in connection with the employer's business. The rule governing standard exceptions does not apply here
Nonscheduled airlines – flight crew members.

[Statutory Authority: RCW 51.16.035. 87-24-060 (Order 87-26), § 296-17-743, filed 12/1/87, effective 1/1/88; 85-24-032 (Order 85-33), § 296-17-743, filed 11/27/85, effective 1/1/86; Order 76-36, § 296-17-743, filed 11/30/76; Order 73-22, § 296-17-743, filed 11/9/73, effective 1/1/74.]

WAC 296-17-754 Classification 7101.

Corporate officers, N.O.C.

[Statutory Authority: RCW 51.16.035. 87-24-060 (Order 87-26), § 296-17-754, filed 12/1/87, effective 1/1/88; 85-24-032 (Order 85-33), § 296-17-754, filed 11/27/85, effective 1/1/86. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 78-12-043 (Order 78-23), § 296-17-754, filed 11/27/78, effective 1/1/79.]

WAC 296-17-755 Classification 7102.**Football teams**

This classification applies to football teams which are participants in the National Football League and includes players, referees, coaches, and managers.

[Statutory Authority: RCW 51.16.035. 87-24-060 (Order 87-26), § 296-17-755, filed 12/1/87, effective 1/1/88; 85-24-032 (Order 85-33), § 296-17-755, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-755, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-755, filed 11/30/83, effective 1/1/84. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-755, filed 11/30/79, effective 1/1/80.]

WAC 296-17-757 Classification 7104.

Temporary help company: Administrative offices including clerical office and sales personnel.

This classification applies only to those employees of the temporary help company assigned to work in the administrative or branch offices of a temporary help company. It does not apply to employees of a temporary help company assigned to a customer's administrative or clerical office. This classification is also applicable to an employment agency's administrative office when conducted in connection with a temporary help company operation.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-757, filed 5/31/88, effective 7/1/88; 85-24-032 (Order 85-33), § 296-17-757, filed 11/27/85, effective 1/1/86; 83-24-017 (Order 83-36), § 296-17-757, filed 11/30/83, effective 1/1/84. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-757, filed 11/30/79, effective 1/1/80.]

WAC 296-17-758 Classification 7105.

Temporary help company: Office support services.

This classification applies to employees of a temporary help company who are assigned on a temporary basis to its customers and who are engaged wholly in office work for such customers. This classification would include occupations such as clerks, typists, receptionists, secretaries, accountants, bookkeepers, word processors, data entry and computer operators, programmers, drafters, designers, technical writers, technical illustrators, design engineers, telemarketers, and dispatchers. Employees subject to this classification are not required to physically be located in a clerical office. The test is whether or not they perform clerical office work as described in this classification. A division of worker hours is not permitted between this classification and any other classification.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-758, filed 5/31/88, effective 7/1/88; 87-12-032 (Order 87-12), § 296-17-758, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-758, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-758, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-758, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-758, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-758, filed 11/30/81, effective 1/1/82; 80-17-016 (Order 80-23), § 296-17-758, filed 11/13/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-758, filed 11/30/79, effective 1/1/80.]

WAC 296-17-759 Classification 7106.

Temporary help company: Retail or wholesale store services.

This classification applies to employees of a temporary help company who are assigned on a temporary basis to its customers and who are engaged in activities such as cashiering, stocking, product demonstration, booth aids, modeling, outside sales, and inventory taking.

For the purposes of this section, inventory taking is limited to those services provided to store operations which are performed exclusively at ground level. Inventory taking utilizing ladders, step stools, or at any height or when performed for customers not engaged in store operations are to be reported separately in risk classification 7114 provided they do not operate equipment or machinery.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-759, filed 5/31/88, effective 7/1/88; 87-12-032 (Order 87-12), § 296-17-759, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-759, filed 11/27/85, effective 1/1/86; 83-24-017 (Order 83-36), § 296-17-759, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-759, filed 11/29/82, effective 1/1/83; 80-17-016 (Order 80-23), § 296-17-759, filed 11/13/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-759, filed 11/30/79, effective 1/1/80.]

WAC 296-17-760 Classification 7107.

Temporary help company: Bakery, restaurant, or food sundry preparation services, and musicians or entertainers.

This classification applies to employees of a temporary help company who are assigned on a temporary basis to its customers and who are engaged in activities such as baking, cooking, food preparation, waiting and bussing tables, and dishwashing, or who are assigned to a customer and who are engaged as musicians or entertainers.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-760, filed 5/31/88, effective 7/1/88; 87-12-032 (Order 87-12), § 296-17-760, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-760, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-760, filed 2/28/85, effective 4/1/85; 83-24-017 (Order 83-36), § 296-17-760, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-760, filed 11/29/82, effective 1/1/83; 80-17-016 (Order 80-23), § 296-17-760, filed 11/13/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-760, filed 11/30/79, effective 1/1/80.]

WAC 296-17-761 Classification 7108.

Temporary help company: Warehousing and repackaging of soft goods, retail products, and pharmaceuticals.

This classification applies to employees of a temporary help company who are assigned on a temporary basis to its customers and who are engaged in warehousing or repackaging of items such as clothing, fabric, yarn, shoes, glassware, art, linens, kitchenware, drugs and pharmaceutical preparations, computer discs, bulk film or cassette tapes and records.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-761, filed 5/31/88, effective 7/1/88; 87-12-032 (Order 87-12), § 296-17-761, filed 5/29/87, effective 7/1/87; 86-12-041 (Order 86-18), § 296-17-761, filed 5/30/86, effective 7/1/86; 85-24-032 (Order 85-33), § 296-17-761, filed 11/27/85, effective 1/1/86; 83-24-017 (Order 83-36), § 296-17-761, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-761, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-761, filed 11/30/81, effective 1/1/82; 80-17-016 (Order 80-23), § 296-17-761, filed 11/13/80, effective 1/1/81. Statutory Authority: RCW 51.04-.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-761, filed 11/30/79, effective 1/1/80.]

WAC 296-17-762 Classification 7109.

Temporary help company: Electronic, precision, and scientific equipment assembly and technician services.

This classification applies to employees of a temporary help company assigned on a temporary basis to its customers and who are engaged in tailoring or dress-making or in the assembly of electronic or biomedical equipment and employees engaged in printing and bindery work. This classification includes occupations such as electronic assemblers, mechanical assemblers, electro-mechanical assemblers, quality control inspectors, test technicians, kit pullers, storekeepers, laboratory technicians, printers, offset operators, lead typesetters, and bindery workers.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-762, filed 5/31/88, effective 7/1/88; 85-24-032 (Order 85-33), § 296-17-762, filed 11/27/85, effective 1/1/86; 83-24-017 (Order 83-36), § 296-17-762, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-762, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-762, filed 11/30/81, effective 1/1/82. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-762, filed 11/30/79, effective 1/1/80.]

WAC 296-17-76201 Classification 7110.

Temporary help company: Field engineer and technician services.

This classification applies to employees of a temporary help company assigned on a temporary basis to its customers who are engaged in duties away from the customers premises and who are providing field engineering, field technician, traffic counters and surveying services, telephone installation and service within buildings, vending machine service and parking lot or garage attendants, weigh scale attendants, and service station attendants excluding mechanics.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-76201, filed 5/31/88, effective 7/1/88.]

WAC 296-17-76202 Classification 7111.

Temporary help company: Health care, medical laboratory, quality control services, testing laboratories, N.O.C., home maker services and home health services.

This classification applies to employees of a temporary help company who are assigned on a temporary basis to its customers and who are providing health care services and includes such employments as therapists, nurses, nurses aides, physicians, laboratory technicians and assistants.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-76202, filed 5/31/88, effective 7/1/88.]

WAC 296-17-76203 Classification 7112.

Temporary help company: Agricultural services.

This classification applies to employees of a temporary help company assigned on a temporary basis to its customers and who are engaged in any aspects of agricultural work such as field crops, livestock, stables, dairies, nurseries and greenhouses including the operation of power driven farm machinery or equipment.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-76203, filed 5/31/88, effective 7/1/88.]

WAC 296-17-76204 Classification 7113.

Temporary help company: Janitorial, plant or facility supplemental maintenance and groundskeeping services.

This classification applies to employees of a temporary help company assigned on a temporary basis to its customers and who are engaged in janitorial work, preoccupancy building cleanup, plant maintenance, and groundskeeping work such as mowing lawns, pruning shrubs and weeding or grounds maintenance of existing landscape as compared to new construction work. Landscape workers involved exclusively in hand labor work such as raking, digging, using wheel barrow to haul soil, beauty bark or decorative rock, whether performed as maintenance of existing landscape or new landscape work are subject to this risk classification (7113). Separately report employees engaged in exterior window cleaning, debris or building material cleanup and removal, and new landscape construction (i.e., clearing of land, installation of underground sprinkler systems, moving boulders) in risk classification 7118. Tree removal to be reported separately in risk classification 7121. A division of worker hours is not permitted between this classification and any other classification.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-76204, filed 5/31/88, effective 7/1/88.]

WAC 296-17-76205 Classification 7114.

Temporary help company: Assembly work, N.O.C. and freight handling—bulk merchandise, N.O.C.

This classification applies to employees of a temporary help company assigned on a temporary basis to its customers and who are engaged in the assembly of wood, metal, or plastic products and freight handling of bulk merchandise who do not operate power driven machinery or equipment. Employees assigned to this classification may, however, use small power driven hand tools in the assembly process and hand trucks for moving bulk merchandise. This classification also includes inventory takers, N.O.C. Employees whose duties include the operation of power driven equipment or machinery, although they may also be engaged in assembly work or freight handling activities, are to be reported without division of hours in risk classification 7117.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-76205, filed 5/31/88, effective 7/1/88.]

WAC 296-17-76206 Classification 7115.

Temporary help company: Cannery or food processing services, including fresh fruit and vegetable packing and food dehydrating processes.

This classification applies to employees of a temporary help company assigned on a temporary basis to its customers and who are assigned to work in a cannery, fruit and vegetable packing or freezer operation. This classification includes employees engaged in cooking or otherwise preparing food prior to packaging or canning, but excludes employees engaged in plant or cannery equipment or machinery operations or maintenance which are to be reported separately in risk classification 7117.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-76206, filed 5/31/88, effective 7/1/88.]

WAC 296-17-76207 Classification 7116.

Temporary help company: Flagging for public utility, power, water, or gas line construction.

This classification applies to employees of a temporary help company assigned on a temporary basis to its customers and who are engaged in flagging services for a public utility company involved in the extension of overhead or underground power line construction or underground water or gas line construction.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-76207, filed 5/31/88, effective 7/1/88.]

WAC 296-17-76208 Classification 7117.

Temporary help company: Machine operators and skilled craftpersons—plant or shop operations, N.O.C.

This classification applies to employees of a temporary help company assigned on a temporary basis to its customers who operate power driven equipment or machinery such as forklifts, table saws, drill presses, industrial packaging and processing equipment or machinery and skilled craftpersons such as machinists, mechanics, welders, tool and die makers, carpenters, cabinet makers, and who are assigned to work in the customer's plant or shop but does not apply to maritime trades or plant maintenance workers.

This classification includes such industries as cabinet shops, lumber remanufacturing, canneries, amusement parks, sign paint shops, laundries, printing shops but would exclude shake or shingle mills.

Employees whose duties include work at a construction site are to be reported without a division of hours in risk classification 7118 except for those employees working in the specialty trades of plumbing, electrical wiring, or sheet metal work, who are subject to this risk classification (7117). Employees assigned to work in maritime trades subject to Washington workers compensation laws are to be reported separately in risk classification 7120. Employees assigned to work in a customer's plant as maintenance workers are to be reported separately in risk classification 7113.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-76208, filed 5/31/88, effective 7/1/88.]

WAC 296-17-76209 Classification 7118.

Temporary help company: Construction.

This classification applies to employees of a temporary help company assigned on a temporary basis to its customers and who are engaged in any aspect of construction work such as road, underground or overhead utility lines, fence, metal erection, signs or lighting including the operation of equipment, machinery, and tools by such employees. This classification also applies to construction security personnel and flaggers, N.O.C. Employees working in the specialty trades of plumbing, electrical wiring, or sheet metal work are to be reported separately in risk classification 7117.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-76209, filed 5/31/88, effective 7/1/88.]

WAC 296-17-76210 Classification 7119.

Temporary help company: Commercial vehicle operations, N.O.C. and sawmill operations.

This classification applies to employees of a temporary help company assigned on a temporary basis to its customers and who are engaged in commercial vehicle operations such as truck, delivery, and taxi drivers or who are engaged in any aspect of sawmill work, such as operating machinery, grading lumber, or sorting and stacking lumber.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-76210, filed 5/31/88, effective 7/1/88.]

WAC 296-17-76211 Classification 7120.

Temporary help company: Hazardous waste handling and maritime employments.

This classification applies to employees of a temporary help company assigned on a temporary basis to its customers who are engaged in hazardous waste handling or maritime employments subject to Washington workers compensation laws including diving or subaqueous work.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-76211, filed 5/31/88, effective 7/1/88.]

WAC 296-17-76212 Classification 7121.

Temporary help company: Logging, shake or shingle mills, and aircraft flight crew members.

This classification applies to employees of a temporary help company assigned on a temporary basis to its customers and who are engaged in any phase of logging or aircraft operations or who are assigned to work in any lumbering mill including equipment or machinery operators related to industries subject to this classification.

[Statutory Authority: RCW 51.16.035. 88-12-050 (Order 88-06), § 296-17-76212, filed 5/31/88, effective 7/1/88.]

WAC 296-17-765 Classification 7203.

Community service workers

This classification includes all community service workers performing work for counties, cities, towns, state agencies, or nonprofit organizations pursuant to court order or under the provisions of chapter 13.40 RCW.

[Statutory Authority: RCW 51.16.035. 87-12-032 (Order 87-12), § 296-17-765, filed 5/29/87, effective 7/1/87; 85-24-032 (Order 85-33), § 296-17-765, filed 11/27/85, effective 1/1/86. Statutory Authority: RCW 51.04.020(1). 84-12-048 (Order 84-12), § 296-17-765, filed 6/1/84. Statutory Authority: RCW 51.16.035. 83-24-017 (Order 83-36), § 296-17-765, filed 11/30/83, effective 1/1/84; 81-24-042 (Order 81-30), § 296-17-765, filed 11/30/81, effective 1/1/82.]

WAC 296-17-773 Classification 7302.

Livestock farms
Riding academies

This classification includes all farm operations related and incidental to the enterprises described above and applies to all acreage devoted to the raising of these animals.

[Statutory Authority: RCW 51.16.035. 88-12-065 (Order 88-05), § 296-17-773, filed 5/31/88; 85-24-032 (Order 85-33), § 296-17-773, filed 11/27/85, effective 1/1/86; 83-24-017 (Order 83-36), § 296-17-773, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-773, filed 11/29/82, effective 1/1/83.]

WAC 296-17-850 Experience rating plan—Eligibility and experience period. (1) **Eligibility.** Each employer who has reported experience during more than one fiscal year of the "experience period" shall have his base rates multiplied by an "experience modification" calculated in accordance with the rules of this manual. The development of the "experience modification" as set forth in WAC 296-17-855 shall include losses and exposure reported in all risk classes.

(2) **Experience period.** The "experience period" shall be the oldest three of the four fiscal years preceding the effective date of premium rates as set forth in WAC 296-17-895.

[Statutory Authority: RCW 51.16.035. 87-24-060 (Order 87-26), § 296-17-850, filed 12/1/87, effective 1/1/88; 87-12-032 (Order 87-12), § 296-17-850, filed 5/29/87, effective 7/1/87; 86-12-041 (Order 86-18), § 296-17-850, filed 5/30/86, effective 7/1/86; 85-24-032 (Order 85-33), § 296-17-850, filed 11/27/85, effective 1/1/86; 85-13-046 (Order 85-13), § 296-17-850, filed 6/17/85; 82-24-047 (Order 82-38), § 296-17-850, filed 11/29/82, effective 1/1/83. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-850, filed 11/30/79, effective 1/1/80; Order 76-18, § 296-17-850, filed 5/28/76, effective 7/1/76; Order 74-40, § 296-17-850, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-850, filed 11/9/73, effective 1/1/74.]

WAC 296-17-855 Experience modification. The basis of the experience modification shall be a comparison of the actual losses charged to an employer during the experience period with the losses which would be expected for an average employer reporting the same exposures in each classification. The comparison shall contain actuarial refinements designed to mitigate the effects of losses which may be considered catastrophic or of doubtful statistical significance, due consideration being given to the volume of the employer's experience. Except for those employers who qualify for an adjusted experience modification as specified in WAC 296-17-

860 or 296-17-865, the experience modification shall be calculated from the formula:

$$\text{MODIFICATION} = \frac{A_p + W A_e + (1-W) E_e + B}{E + B}$$

The components A_p , $W A_e$, and $(1-W) E_e$ are values which shall be charged against an employer's experience record. The component, E , shall be the expected value of these charges for an average employer reporting the same exposures in each classification. The meaning and function of each symbol in the formula is specified below.

" A_p " signifies "primary actual losses." For each claim the primary actual loss is defined as that portion of the claim which is considered completely rateable for all employers and which is to enter the experience modification calculation at its full value. For each claim in excess of \$8,360 the primary actual loss shall be determined from the formula:

$$\text{Primary loss} = \frac{20,900}{\text{Total loss} + 12,540} \times \text{total loss}$$

Primary actual losses for selected claim values are shown in Table I. For each claim less than \$8,360 the full value of the claim shall be considered a primary loss.

" A_e " signifies "excess actual losses." For each claim the excess actual loss is defined as that portion of the claim which is not considered completely rateable for all employers. The excess actual loss for each claim shall be determined by subtracting the primary loss from the total loss.

" W " signifies "W value." For each employer, the W value determines the portion of the actual excess losses which shall be included in the calculation of his experience modification, due consideration being given to the volume of his experience. This amount is represented by the symbol " $W A_e$ " in the experience modification formula. W values are set forth in Table II.

" E " signifies "expected losses." An employer's expected losses shall be determined by multiplying his reported exposure in each classification during the experience period by the classification expected loss rate. Expected loss rates are set forth in Table III.

" E_e " signifies "expected excess losses." Expected losses in each classification shall be multiplied by the classification " D -Ratio" to obtain "expected primary losses." Expected excess losses shall then be calculated by subtracting expected primary losses from expected total losses. Each employer shall have a statistical charge included in the calculation of his experience modification, said charge to be actuarially equivalent to the amount forgiven an average employer because of the exclusion of a portion of his excess actual losses. This charge is represented by " $(1-W) E_e$ " in the experience modification formula. D -Ratios are set forth in Table III.

" B " signifies "B value" or "ballast." In order to limit the effect of a single severe accident on the modification of a small employer, a stabilizing element (B value) shall

be added to both actual and expected losses. B values are set forth in Table II.

[Statutory Authority: RCW 51.16.035 and 51.04.020. 88-24-012 (Order 88-30), § 296-17-855, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 87-24-060 (Order 87-26), § 296-17-855, filed 12/1/87, effective 1/1/88. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 86-24-042 (Order 86-41), § 296-17-855, filed 11/26/86. Statutory Authority: RCW 51.16.035. 85-24-032 (Order 85-33), § 296-17-855, filed 11/27/85, effective 1/1/86; 84-24-016 (Order 84-23), § 296-17-855, filed 11/28/84, effective 1/1/85; 83-24-017 (Order 83-36), § 296-17-855, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-855, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-855, filed 11/30/81, effective 1/1/82; 80-17-016 (Order 80-23), § 296-17-855, filed 11/13/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-855, filed 11/30/79, effective 1/1/80; Order 77-27, § 296-17-855, filed 11/30/77, effective 1/1/78; Order 74-40, § 296-17-855, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-855, filed 11/9/73, effective 1/1/74.]

WAC 296-17-86501 Building industry experience modification limitations. The premiums of building construction employers subject to the risk classifications 0505, 0506, 0507, 0510, 0511, 0512, 0513, 0514, 0515, and 0516 shall be experience rated beginning January 1, 1988, using the reported past experience of such employers as provided for in the department's experience rating plan. However, the initial experience rating adjustment of these classifications for each such employer shall be made from a base modification of 1.0000, with adjustments limited to twenty-five percent annually until the actual experience rating developed by the department for each such employer has been reached or four years from the effective date of this section whichever comes first. Thereafter, adjustments will be made in accordance with the parameters established by the department's experience rating plan. Premiums of building construction employers reported in all other risk classifications not specifically listed above which are currently experience rated are not subject to the limitations imposed by this section and shall be computed utilizing the actual earned experience rating of each building construction employer, in accordance with the department's experience rating plan.

[Statutory Authority: RCW 51.16.035 and 51.04.020. 88-24-012 (Order 88-30), § 296-17-86501, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 87-24-049 (Order 87-27), § 296-17-86501, filed 11/30/87, effective 1/1/88.]

WAC 296-17-86502 Medical aid experience modification limitations. The medical aid fund premiums shall be experience rated beginning January 1, 1989, using the reported past experience of employers as provided for in the department's experience rating plan. However, the initial experience rating adjustment for each employer shall be made from a base modification of 1.0000, with adjustments limited to twenty-five percent annually until the actual experience rating developed by the department for each employer has been reached or four years from the effective date of this section, whichever comes first. Thereafter, adjustments will be made in accordance with the parameters established by the department's experience rating plan.

[Statutory Authority: RCW 51.16.035. 88-16-012 (Order 88-12), § 296-17-86502, filed 7/22/88, effective 1/1/89.]

WAC 296-17-870 Evaluation of actual losses. Except as provided in the following subsections of this paragraph, actual losses shall include all payments as of the "valuation date" for each claim arising from an accident occurring during the experience period. Losses for claims open as of the valuation date may also include a reserve for future payments. Actual losses on claims for accidents occurring outside of the experience period shall not be included.

(1) **Valuation date.** The valuation date shall be on and include December 31, one year and one day immediately preceding the effective date of premium rates as set forth in WAC 296-17-895. For experience modifications effective January 1, 1990, the valuation date shall be June 1, seven months immediately preceding the effective date of premium rates.

(2) **Retroactive adjustments - revision of losses between valuation dates.** No claim value shall be revised between valuation dates and no retroactive adjustment of an experience modification shall be made because of disputation concerning the judgment of the claims examiner or because of subsequent developments except as specifically provided in the following cases:

(a) In cases where loss values are included or excluded through mistake other than error of judgment.

(b) In cases where a third party recovery is made.

(c) In cases where the claim qualifies as a second injury claim under the provisions of RCW 51.16.120.

(d) In cases where a claim, which was previously evaluated as a compensable claim, is closed and is determined to be noncompensable (ineligible for benefits other than medical treatment).

(e) In cases where a claim is closed and is determined to be ineligible for any benefits.

In the above specified cases retroactive adjustment of the experience modification shall be made for each rating in which the claim was included.

(3) **Average death value.** Each fatality occurring to a worker included within the mandatory or elective coverage of Title 51 RCW shall be assigned the "average death value," said value to be the average incurred cost for all such fatalities occurring during the experience period. The average death value is set forth in Table II.

(4) **Third party recovery.** In the event of a third party recovery on a claim, the employer shall be charged for a portion of the actual loss amount, gross of such recovery, established on the claim for each year in which the claim's injury date falls within the experience period (see WAC 296-17-850). This portion shall be calculated at the time the recovery is made, and shall be determined by taking the ratio of the total cost of the claim, including attorneys' fees, after recovery, to the total cost of the claim before recovery. If the claim is open at the time the recovery is made, then costs before and after recovery may include an allowance for future claim payments. Both the primary and excess components of the actual loss amount shall be reduced in the same proportion.

(5) **Second injury claims.** The primary and excess values of any claim which becomes eligible for second injury relief under the provisions of RCW 51.16.120, as now or hereafter amended, shall be reduced by the percentage of relief granted.

(6) **Occupational disease claims.** When a claim results from an employee's exposure to an occupational disease hazard, the "date of injury," for the purposes of experience rating, shall be the date on which the disability was diagnosed, giving rise to the filing of a claim for benefits. The cost of any occupational disease claim, paid from the accident fund and medical aid fund and arising from exposure to the disease hazard under two or more employers, shall be prorated to each period of employment involving exposure to the hazard. Each insured employer who had employed the claimant during the experience period, and for at least ten percent of the claimant's exposure to the hazard, shall be charged for his share of the claim based upon the prorated costs.

(7) **Maximum claim value.** No claim shall enter an employer's experience record at a value greater than the "maximum claim value." The maximum claim value is set forth in Table II.

[Statutory Authority: RCW 51.16.035 and 51.04.020. 88-24-012 (Order 88-30), § 296-17-870, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 88-16-012 (Order 88-12), § 296-17-870 filed 7/22/88, effective 1/1/89; 81-24-042 (Order 81-30), § 296-17-870, filed 11/30/81, effective 1/1/82. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 78-12-043 (Order 78-23), § 296-17-870, filed 11/27/78, effective 1/1/79; Order 75-38, § 296-17-870, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-870, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-870, filed 11/9/73, effective 1/1/74.]

WAC 296-17-87309 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-17-875 Table I.

Primary Losses for Selected Claim Values

CLAIM VALUE	PRIMARY LOSS
8,360	8,360
9,484	9,000
11,505	10,000
13,933	11,000
16,908	12,000
25,443	14,000
40,947	16,000
77,834	18,000
110,259*	18,766
209,000**	19,717

* Average death value

** Maximum claim value

[Statutory Authority: RCW 51.16.035 and 51.04.020. 88-24-012 (Order 88-30), § 296-17-875, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 87-24-060 (Order 87-26), § 296-17-875, filed 12/1/87, effective 1/1/88. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 86-24-042 (Order 86-41), § 296-17-875, filed 11/26/86. Statutory Authority: RCW 51.16.035. 86-12-041 (Order 86-18), § 296-17-875, filed 5/30/86, effective 7/1/86; 85-24-032 (Order 85-33), § 296-17-875, filed 11/27/85, effective

1/1/86; 84-24-016 (Order 84-23), § 296-17-875, filed 11/28/84, effective 1/1/85; 83-24-017 (Order 83-36), § 296-17-875, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-875, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-875, filed 11/30/81, effective 1/1/82; 80-17-016 (Order 80-23), § 296-17-875, filed 11/13/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-875, filed 11/30/79, effective 1/1/80. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 78-12-043 (Order 78-23), § 296-17-875, filed 11/27/78, effective 1/1/79; Order 77-27, § 296-17-875, filed 11/30/77, effective 1/1/78; Order 76-36, § 296-17-875, filed 11/30/76; Order 75-38, § 296-17-875, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-875, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-875, filed 11/9/73, effective 1/1/74.]

WAC 296-17-880 Table II.

"B" and "W" Values

Maximum Claim Value = \$209,000
Average Death Value = \$110,259

Expected Losses	B	W
4,527 & Under	39,434	0.00
4,528 - 9,124	39,040	0.01
9,125 - 13,788	38,645	0.02
13,789 - 18,523	38,251	0.03
18,524 - 23,331	37,857	0.04
23,332 - 28,212	37,462	0.05
28,213 - 33,170	37,068	0.06
33,171 - 38,206	36,674	0.07
38,207 - 43,322	36,279	0.08
43,323 - 48,520	35,885	0.09
48,521 - 53,802	35,491	0.10
53,803 - 59,171	35,096	0.11
59,172 - 64,628	34,702	0.12
64,629 - 70,177	34,308	0.13
70,178 - 75,820	33,913	0.14
75,821 - 81,558	33,519	0.15
81,559 - 87,397	33,125	0.16
87,398 - 93,336	32,730	0.17
93,337 - 99,380	32,336	0.18
99,381 - 105,532	31,942	0.19
105,533 - 111,794	31,547	0.20
111,795 - 118,170	31,153	0.21
118,171 - 124,665	30,759	0.22
124,666 - 131,279	30,364	0.23
131,280 - 138,017	29,970	0.24
138,018 - 144,885	29,576	0.25
144,886 - 151,884	29,181	0.26
151,885 - 159,020	28,787	0.27
159,021 - 166,295	28,392	0.28
166,296 - 173,716	27,998	0.29
173,717 - 181,287	27,604	0.30
181,288 - 189,011	27,209	0.31
189,012 - 196,894	26,815	0.32
196,895 - 204,943	26,421	0.33
204,944 - 213,162	26,026	0.34
213,163 - 221,556	25,632	0.35
221,557 - 230,132	25,238	0.36
230,133 - 238,896	24,843	0.37
238,897 - 247,855	24,449	0.38
247,856 - 257,016	24,055	0.39
257,017 - 266,385	23,660	0.40

Expected Losses	B	W	Expected Losses	B	W
266,386 - 275,970	23,266	0.41	1,899,344 - 1,991,020	789	0.98
275,971 - 285,780	22,872	0.42	1,991,021 - 2,089,999	394	0.99
285,781 - 295,822	22,477	0.43	2,090,000 OR MORE	0	1.00
295,823 - 306,105	22,083	0.44	[Statutory Authority: RCW 51.16.035 and 51.04.020. 88-24-012 (Order 88-30), § 296-17-880, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 87-24-060 (Order 87-26), § 296-17-880, filed 12/1/87, effective 1/1/88. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 86-24-042 (Order 86-41), § 296-17-880, filed 11/26/86. Statutory Authority: RCW 51.16.035. 85-24-032 (Order 85-33), § 296-17-880, filed 11/27/85, effective 1/1/86; 84-24-016 (Order 84-23), § 296-17-880, filed 11/28/84, effective 1/1/85; 83-24-017 (Order 83-36), § 296-17-880, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-880, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-880, filed 11/30/81, effective 1/1/82; 80-17-016 (Order 80-23), § 296-17-880, filed 11/13/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-880, filed 11/30/79, effective 1/1/80. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 78-12-043 (Order 78-23), § 296-17-880, filed 11/27/78, effective 1/1/79; Order 77-27, § 296-17-880, filed 11/30/77, effective 1/1/78; Order 76-36, § 296-17-880, filed 11/30/76; Order 75-38, § 296-17-880, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-880, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-880, filed 11/9/73, effective 1/1/74.]		
306,106 - 316,639	21,689	0.45			
316,640 - 327,432	21,294	0.46			
327,433 - 338,496	20,900	0.47			
338,497 - 349,841	20,506	0.48			
349,842 - 361,477	20,111	0.49			
361,478 - 373,417	19,717	0.50			
373,418 - 385,674	19,323	0.51			
385,675 - 398,260	18,928	0.52			
398,261 - 411,189	18,534	0.53			
411,190 - 424,478	18,140	0.54			
424,479 - 438,139	17,745	0.55			
438,140 - 452,190	17,351	0.56			
452,191 - 466,650	16,957	0.57			
466,651 - 481,535	16,562	0.58			
481,536 - 496,867	16,168	0.59			
496,868 - 512,665	15,774	0.60			
512,666 - 528,952	15,379	0.61			
528,953 - 545,752	14,985	0.62			
545,753 - 563,090	14,591	0.63			
563,091 - 580,993	14,196	0.64			
580,994 - 599,488	13,802	0.65			
599,489 - 618,609	13,408	0.66			
618,610 - 638,386	13,013	0.67			
638,387 - 658,856	12,619	0.68			
658,857 - 680,056	12,225	0.69			
680,057 - 702,026	11,830	0.70			
702,027 - 724,810	11,436	0.71			
724,811 - 748,456	11,042	0.72			
748,457 - 773,013	10,647	0.73			
773,014 - 798,537	10,253	0.74			
798,538 - 825,086	9,858	0.75			
825,087 - 852,725	9,464	0.76			
852,726 - 881,525	9,070	0.77			
881,526 - 911,558	8,675	0.78			
911,559 - 942,909	8,281	0.79			
942,910 - 975,667	7,887	0.80			
975,668 - 1,009,930	7,492	0.81			
1,009,931 - 1,045,806	7,098	0.82			
1,045,807 - 1,083,414	6,704	0.83			
1,083,415 - 1,122,881	6,309	0.84			
1,122,882 - 1,164,352	5,915	0.85			
1,164,353 - 1,207,986	5,521	0.86			
1,207,987 - 1,253,956	5,126	0.87			
1,253,957 - 1,302,459	4,732	0.88			
1,302,460 - 1,353,711	4,338	0.89			
1,353,712 - 1,407,954	3,943	0.90			
1,407,955 - 1,465,460	3,549	0.91			
1,465,461 - 1,526,537	3,155	0.92			
1,526,538 - 1,591,528	2,760	0.93			
1,591,529 - 1,660,826	2,366	0.94			
1,660,827 - 1,734,876	1,972	0.95			
1,734,877 - 1,814,187	1,577	0.96			
1,814,188 - 1,899,343	1,183	0.97			

WAC 296-17-885 Table III.

Expected Loss Rates and D-Ratios
Expected Loss Rates in Dollars Per Worker Hour
for Indicated Fiscal Year

Class	1985	1986	1987	D-Ratio
0101	1.0201	.9484	.8175	.411
0102	1.0280	.9583	.8280	.449
0103	1.3328	1.2376	1.0652	.381
0104	1.0174	.9385	.8035	.314
0105	1.1115	1.0351	.8929	.416
0106	1.8162	1.6879	1.4540	.399
0107	.8341	.7771	.6712	.440
0108	.8902	.8272	.7127	.406
0109	2.1966	2.0325	1.7444	.342
0201	1.6840	1.5595	1.3398	.361
0202	2.6587	2.4653	2.1182	.338
0206	1.5649	1.4480	1.2427	.339
0301	.5478	.5131	.4450	.511
0302	1.6473	1.5286	1.3160	.396
0306	.7815	.7282	.6288	.436
0307	.6873	.6406	.5533	.440
0401	2.8637	2.6679	2.3040	.439
0402	1.4820	1.3806	1.1916	.426
0403	1.1425	1.0583	.9092	.355
0502	1.0510	.9776	.8429	.412
0503	1.4127	1.3161	1.1359	.426
0504	1.0523	.9828	.8506	.473
0505	1.3240	1.2327	1.0638	.431
0506	2.6557	2.4777	2.1415	.451
0507	2.8637	2.6679	2.3040	.439
0508	2.6750	2.4774	2.1272	.342
0509	2.0372	1.8832	1.6146	.320
0510	1.1615	1.0835	.9367	.456
0511	1.0696	.9933	.8554	.394
0512	1.3484	1.2570	1.0859	.446
0513	.6796	.6337	.5478	.454

Class	1985	1986	1987	D-Ratio	Class	1985	1986	1987	D-Ratio
0514	1.1615	1.0835	.9367	.456	2906	.5002	.4676	.4052	.490
0515	1.7602	1.6363	1.4106	.413	2907	.4396	.4115	.3570	.508
0516	1.3240	1.2327	1.0638	.431	2908	.8817	.8232	.7122	.468
0601	.4882	.4552	.3933	.445	2909	.5694	.5321	.4606	.479
0602	.3655	.3405	.2941	.441	3101	.5530	.5138	.4427	.399
0603	.6843	.6352	.5470	.396	3102	.3754	.3502	.3028	.456
0604	1.7363	1.6147	1.3907	.376	3103	.3754	.3502	.3028	.456
0606	.2255	.2105	.1820	.458	3104	.4944	.4611	.3982	.435
0607	.2602	.2431	.2103	.468	3105	.7084	.6611	.5715	.455
0608	.2609	.2438	.2111	.479	3301	.7336	.6867	.5958	.507
0701	1.2606	1.1674	1.0031	.367	3302	.6764	.6314	.5463	.468
0803	.3608	.3360	.2898	.417	3303	.2520	.2348	.2027	.426
0804	.5685	.5282	.4551	.400	3309	.4233	.3942	.3398	.403
0901	1.8533	1.7128	1.4693	.346	3401	.3536	.3306	.2863	.482
1002	1.0182	.9514	.8238	.480	3402	.3254	.3048	.2643	.509
1003	.5495	.5118	.4420	.435	3403	.1294	.1210	.1047	.476
1004	.5495	.5118	.4420	.435	3404	.3454	.3236	.2807	.516
1005	3.4288	3.2005	2.7695	.469	3405	.2391	.2230	.1927	.445
1007	.1801	.1685	.1459	.488	3406	.1842	.1723	.1491	.487
1101	.5366	.5012	.4334	.463	3407	.2677	.2495	.2156	.442
1102	1.1561	1.0749	.9267	.413	3408	.1014	.0946	.0817	.441
1103	.4109	.3847	.3336	.505	3409	.1568	.1464	.1265	.450
1104	.5049	.4726	.4097	.503	3501	.6539	.6094	.5261	.432
1106	.1905	.1787	.1551	.541	3503	.2670	.2503	.2172	.524
1108	.4240	.3961	.3428	.472	3506	.6009	.5591	.4823	.421
1109	.8021	.7479	.6462	.449	3508	.4341	.4067	.3529	.517
1301	.2238	.2087	.1804	.448	3602	.0747	.0699	.0607	.513
1303	.1797	.1676	.1448	.452	3603	.5649	.5286	.4582	.499
1304	.0162	.0152	.0131	.501	3604	1.0841	1.0072	.8674	.390
1305	.3221	.3017	.2616	.511	3605	.3747	.3501	.3029	.472
1401	1.3165	1.2297	1.0625	.443	3606	.7142	.6679	.5782	.482
1404	.5772	.5375	.4638	.422	3701	.2602	.2425	.2095	.441
1405	.4955	.4625	.4000	.464	3702	.3853	.3586	.3095	.424
1501	.3235	.3019	.2611	.462	3707	.3359	.3145	.2728	.506
1507	.2350	.2193	.1896	.458	3708	.2532	.2368	.2050	.483
1701	1.5921	1.4727	1.2643	.357	3801	.2029	.1894	.1638	.461
1702	1.5921	1.4727	1.2643	.357	3802	.1323	.1243	.1081	.556
1703	.4277	.3982	.3439	.436	3808	.2217	.2078	.1803	.519
1704	.7917	.7362	.6347	.410	3901	.1549	.1447	.1252	.473
1801	.9102	.8467	.7299	.408	3902	.5165	.4819	.4167	.460
1802	.3920	.3654	.3154	.437	3903	1.0118	.9442	.8159	.448
2002	.5345	.4989	.4313	.458	3905	.1305	.1226	.1066	.560
2003	.3658	.3423	.2965	.493	3906	.3725	.3474	.3004	.456
2004	.6522	.6083	.5259	.456	3909	.2443	.2289	.1984	.514
2005	.3011	.2817	.2439	.489	4002	.5876	.5481	.4738	.451
2007	.3286	.3063	.2645	.434	4101	.1645	.1540	.1333	.488
2008	.2502	.2330	.2013	.435	4103	.2712	.2539	.2202	.504
2101	.5840	.5450	.4709	.446	4107	.0880	.0823	.0712	.483
2102	.3658	.3423	.2965	.493	4108	.1645	.1540	.1333	.488
2104	.3026	.2835	.2461	.524	4109	.1645	.1540	.1333	.488
2105	.4697	.4371	.3770	.422	4201	.3008	.2804	.2423	.446
2106	.3693	.3447	.2979	.452	4301	.7740	.7238	.6270	.490
2201	.2466	.2303	.1994	.476	4302	.6395	.5969	.5161	.460
2202	.4462	.4167	.3604	.462	4303	.5919	.5601	.4899	.701
2203	.2780	.2603	.2258	.509	4304	.5371	.5021	.4345	.478
2401	.4715	.4402	.3809	.468	4305	1.1811	1.0996	.9487	.422
2903	.5904	.5534	.4804	.524	4401	.3915	.3666	.3180	.508
2904	.6626	.6201	.5370	.493	4402	.6269	.5855	.5067	.472
2905	.4448	.4163	.3608	.501	4404	.5034	.4713	.4086	.504

Workers' Compensation Insurance

296-17-885

Class	1985	1986	1987	D-Ratio	Class	1985	1986	1987	D-Ratio
4501	.1303	.1211	.1043	.396	6302	.1462	.1362	.1175	.423
4502	.0328	.0305	.0263	.412	6303	.0478	.0448	.0387	.474
4504	.0741	.0695	.0602	.512	6304	.1164	.1088	.0940	.468
4601	.5742	.5340	.4597	.371	6305	.0485	.0454	.0394	.487
4802	.2901	.2715	.2355	.502	6306	.2315	.2163	.1872	.471
4803	.3280	.3068	.2660	.499	6308	.0349	.0324	.0279	.407
4804	.5422	.5076	.4399	.502	6309	.0990	.0928	.0805	.516
4805	.3315	.3097	.2679	.469	6402	.2196	.2052	.1776	.475
4806	.0820	.0768	.0665	.495	6403	.1414	.1327	.1154	.551
4808	.4261	.3970	.3427	.430	6404	.1109	.1040	.0903	.540
4809	.2191	.2052	.1779	.513	6405	.5529	.5153	.4450	.440
4810	.1418	.1325	.1147	.479	6406	.0690	.0646	.0560	.498
4811	.2840	.2651	.2291	.459	6407	.1543	.1447	.1256	.529
4812	.3347	.3129	.2710	.487	6408	.3134	.2913	.2509	.382
4901	.0456	.0426	.0368	.470	6409	.3695	.3453	.2989	.477
4902	.0329	.0307	.0265	.474	6501	.0529	.0497	.0431	.537
4903	.0456	.0426	.0368	.470	6502	.0181	.0169	.0147	.493
4904	.0162	.0152	.0131	.501	6503	.0938	.0868	.0743	.311
4905	.2826	.2652	.2302	.534	6504	.2989	.2809	.2440	.568
4906	.0474	.0444	.0385	.502	6505	.1728	.1618	.1402	.505
4907	.0869	.0811	.0702	.458	6506	.0575	.0538	.0465	.478
4908	.1146	.1071	.0926	.460	6508	.3696	.3462	.3001	.510
4909	.1146	.1071	.0926	.460	6509	.2410	.2255	.1952	.485
5001	3.6616	3.3998	2.9266	.386	6601	.1728	.1617	.1400	.489
5002	.4536	.4249	.3685	.512	6602	.4206	.3945	.3427	.538
5003	1.3866	1.2862	1.1061	.366	6603	.2398	.2241	.1941	.481
5004	1.7928	1.6757	1.4512	.484	6604	.0627	.0585	.0506	.457
5101	.6228	.5807	.5017	.447	6605	.1858	.1740	.1508	.506
5102	1.1768	1.0935	.9422	.403	6607	.1626	.1524	.1322	.533
5103	.7893	.7370	.6374	.464	6608	.2229	.2079	.1796	.448
5106	.6091	.5676	.4900	.429	6609	3.1883	2.9856	2.5873	.505
5108	.6317	.5899	.5103	.467	6610	3.1883	2.9856	2.5873	.505
5109	.5085	.4718	.4058	.372	6611	3.1883	2.9856	2.5873	.505
5201	.2982	.2779	.2401	.438	6612	3.1883	2.9856	2.5873	.505
5204	1.3266	1.2415	1.0771	.505	6613	3.1883	2.9856	2.5873	.505
5206	.3391	.3150	.2714	.401	6704	.1754	.1639	.1418	.469
5207	.1626	.1524	.1322	.533	6705	.6633	.6218	.5396	.527
5208	.8947	.8356	.7231	.473	6706	.3241	.3028	.2619	.467
5209	.5480	.5113	.4418	.450	6707	12.6231*	11.8673*	10.3188*	.578
5301	.0222	.0207	.0179	.451	6708	3.6961	3.4590	2.9950	.491
5305	.0261	.0243	.0210	.438	6709	.1419	.1332	.1156	.547
5306	.0285	.0266	.0230	.453	6801	.4628	.4304	.3711	.415
5307	.2928	.2736	.2368	.476	6802	.3266	.3048	.2634	.450
6103	.0406	.0381	.0329	.503	6803	1.6612	1.5225	1.2963	.256
6104	.2734	.2553	.2207	.460	6804	.2136	.1982	.1706	.372
6105	.2429	.2280	.1980	.542	6809	2.3196	2.1749	1.8859	.529
6107	.1056	.0987	.0852	.455	6901	.0392	.0366	.0317	.701
6108	.4884	.4587	.3988	.554	6902	.4879	.4531	.3903	.401
6109	.0337	.0316	.0274	.508	6903	4.9785	4.5990	3.9400	.302
6201	.1359	.1269	.1098	.463	6904	.1582	.1475	.1274	.443
6202	.5600	.5217	.4504	.428	6905	.2438	.2266	.1951	.386
6203	.0886	.0827	.0715	.451	6906	.1024	.0960	.0830	.701
6204	.1500	.1404	.1217	.505	6907	1.1711	1.0924	.9446	.459
6205	.1500	.1404	.1217	.505	6908	.2658	.2483	.2148	.469
6206	.1500	.1404	.1217	.505	6909	.0581	.0542	.0469	.462
6207	.8973	.8405	.7287	.512	7101	.0268	.0250	.0216	.434
6208	.2051	.1915	.1655	.457	7102	24.2906*	22.7579*	19.7084*	.509
6209	.2371	.2217	.1919	.478	7103	.1809	.1684	.1453	.418
6301	.1072	.1000	.0863	.436	7104	.0406	.0378	.0327	.440

Class	1985	1986	1987	D-Ratio	WAC 296-17-890 Table IV.	
					Expected Loss Range	Maximum Experience Modification
7105	.2862	.2682	.2328	.524		
7106	.5751	.5366	.4641	.462		
7107	1.3032	1.2182	1.0543	.476		
7108	2.2113	2.0656	1.7883	.477		
7109	5.5532	5.1815	4.4795	.456		
7110	.2862	.2682	.2328	.524		
7111	.2862	.2682	.2328	.524		
7112	.5751	.5366	.4641	.462	1- 1,978	0.90
7113	.5751	.5366	.4641	.462	1,979- 2,116	0.89
7114	.5751	.5366	.4641	.462	2,117- 2,266	0.88
7715	.5751	.5366	.4641	.462	2,267- 2,428	0.87
7116	.5751	.5366	.4641	.462	2,429- 2,604	0.86
7117	1.3032	1.2182	1.0543	.476	2,605- 2,795	0.85
7118	2.2113	2.0656	1.7883	.477	2,796- 3,002	0.84
7119	2.2113	2.0656	1.7883	.477	3,003- 3,227	0.83
7120	5.5532	5.1815	4.4795	.456	3,228- 3,473	0.82
7121	5.5532	5.1815	4.4795	.456	3,474- 3,740	0.81
7201	.5216	.4877	.4223	.485	3,741- 4,032	0.80
7202	.0341	.0317	.0273	.401	4,033- 4,351	0.79
7203	.1031	.0962	.0831	.449	4,352- 4,699	0.78
7301	.5622	.5255	.4551	.483	4,700- 5,080	0.77
7302	.6392	.5979	.5173	.480	5,081- 5,499	0.76
7307	.8776	.8242	.7160	.557	5,500- 5,957	0.75
7308	.2218	.2072	.1793	.466	5,958- 6,461	0.74
7309	.1419	.1332	.1156	.547	6,462- 7,016	0.73
					7,017- 7,626	0.72
					7,627- 8,300	0.71
					8,301- 9,044	0.70
					9,045- 9,867	0.69
					9,868-10,779	0.68
					10,780-11,791	0.67
					11,792-12,915	0.66
					12,916 & Over	0.65

*Daily expected loss rate

[Statutory Authority: RCW 51.16.035 and 51.04.020. 88-24-012 (Order 88-30), § 296-17-885, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 88-12-065 (Order 88-05), § 296-17-885, filed 5/31/88; 88-12-050 (Order 88-06), § 296-17-885, filed 5/31/88, effective 7/1/88; 88-06-047 (Order 87-33), § 296-17-885, filed 3/1/88; 87-24-060 (Order 87-26), § 296-17-885, filed 12/1/87, effective 1/1/88; 87-12-032 (Order 87-12), § 296-17-885, filed 5/29/87, effective 7/1/87. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 86-24-042 (Order 86-41), § 296-17-885, filed 11/26/86. Statutory Authority: RCW 51.16.035. 86-12-041 (Order 86-18), § 296-17-885, filed 5/30/86, effective 7/1/86; 85-24-032 (Order 85-33), § 296-17-885, filed 11/27/85, effective 1/1/86; 85-06-026 (Order 85-7), § 296-17-885, filed 2/28/85, effective 4/1/85; 84-24-016 (Order 84-23), § 296-17-885, filed 11/28/84, effective 1/1/85; 83-24-017 (Order 83-36), § 296-17-885, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-885, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-885, filed 11/30/81, effective 1/1/82; 80-17-016 (Order 80-23), § 296-17-885, filed 11/13/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-885, filed 11/30/79, effective 1/1/80. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 78-12-043 (Order 78-23), § 296-17-885, filed 11/27/78, effective 1/1/79, effective 1/1/80. Order 77-27, § 296-17-885, filed 11/30/77, effective 1/1/78; Emergency Order 77-25, § 296-17-885, filed 12/1/77; Order 77-10, § 296-17-885, filed 5/31/77; Order 76-36, § 296-17-885, filed 11/30/76; Order 76-18, § 296-17-885, filed 5/28/76, effective 7/1/76; Order 75-38, § 296-17-885, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-885, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-885, filed 11/9/73, effective 1/1/74.]

[Statutory Authority: RCW 51.16.035 and 51.04.020. 88-24-012 (Order 88-30), § 296-17-890, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 87-24-060 (Order 87-26), § 296-17-890, filed 12/1/87, effective 1/1/88. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 86-24-042 (Order 86-41), § 296-17-890, filed 11/26/86. Statutory Authority: RCW 51.16.035. 85-24-032 (Order 85-33), § 296-17-890, filed 11/27/85, effective 1/1/86; 84-24-016 (Order 84-23), § 296-17-890, filed 11/28/84, effective 1/1/85; 83-24-017 (Order 83-36), § 296-17-890, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-890, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-890, filed 11/30/81, effective 1/1/82; 80-17-016 (Order 80-23), § 296-17-890, filed 11/13/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-890, filed 11/30/79, effective 1/1/80.]

WAC 296-17-895 Industrial insurance accident fund base rates and medical aid base rates by class of industry. Industrial insurance accident fund and medical aid fund base rates by class of industry shall be as set forth below.

Workers' Compensation Insurance

296-17-895

Base Rates Effective January 1, 1989			Base Rates Effective January 1, 1989		
Class	Accident Fund	Medical Aid Fund	Class	Accident Fund	Medical Aid Fund
0101	0.9125	0.5277	1106	0.1181	0.1612
0102	0.9270	0.5371	1108	0.3310	0.2796
0103	1.0931	0.7846	1109	0.6901	0.4548
0104	0.9706	0.4254	1301	0.1793	0.1411
0105	0.8293	0.7555	1303	0.1538	0.1029
0106	1.5560	1.0073	1304	0.0112	0.0123
0107	0.7448	0.4414	1305	0.2470	0.2209
0108	0.8162	0.4374	1401	0.7148	1.1924
0109	1.9588	1.0924	1404	0.4578	0.3641
0201	1.5564	0.7874	1405	0.4228	0.2871
0202	1.9333	1.8051	1501	0.2667	0.1971
0206	1.3705	0.8044	1507	0.1832	0.1542
0301	0.4588	0.3352	1701	1.5644	0.6396
0302	1.5943	0.7119	1702	1.5644	0.6396
0306	0.6617	0.4513	1703	0.3941	0.2126
0307	0.5636	0.4173	1704	0.6857	0.4339
0401	2.5428	1.5295	1801	0.7316	0.5595
0402	1.1525	0.9614	1802	0.3182	0.2411
0403	0.9859	0.6092	2002	0.4216	0.3455
0502	0.8922	0.5962	2003	0.2831	0.2462
0503	1.0919	0.9237	2004	0.5703	0.3615
0504	0.9216	0.5878	2005	0.2256	0.2101
0505	1.1976	0.6797	2007	0.2534	0.2161
0506	2.0977	1.7081	2008	0.2096	0.1468
0507	2.5428	1.5295	2101	0.4157	0.4235
0508	2.2195	1.5145	2102	0.2831	0.2462
0509	1.7384	1.0857	2104	0.2480	0.1919
0510	1.0175	0.6419	2105	0.4212	0.2437
0511	0.9321	0.5740	2106	0.2827	0.2473
0512	1.1642	0.7587	2201	0.2080	0.1464
0513	0.6071	0.3625	2202	0.3174	0.3258
0514	1.0175	0.6419	2203	0.2281	0.1748
0515	1.6333	0.8484	2401	0.4024	0.2737
0516	1.1976	0.6797	2903	0.4811	0.3776
0601	0.3932	0.3048	2904	0.4593	0.5023
0602	0.3301	0.1894	2905	0.3515	0.2927
0603	0.6349	0.3256	2906	0.4266	0.2943
0604	1.1492	1.3215	2907	0.3744	0.2619
0606	0.1721	0.1518	2908	0.7655	0.4982
0607	0.2040	0.1703	2909	0.4629	0.3570
0608	0.2157	0.1597	3101	0.4731	0.3073
0701	1.2004	0.5530	3102	0.3257	0.2108
0803	0.2796	0.2342	3103	0.3257	0.2108
0804	0.4958	0.3058	3104	0.3306	0.3800
0901	1.8286	0.7286	3105	0.5698	0.4456
1002	0.8661	0.5983	3301	0.6669	0.3928
1003	0.4663	0.3159	3302	0.6012	0.3672
1004	0.4663	0.3159	3303	0.1854	0.1749
1005	3.2320	1.6677	3309	0.2933	0.3108
1007	0.1380	0.1224	3401	0.2848	0.2250
1101	0.3831	0.3905	3402	0.2564	0.2159
1102	1.0390	0.5935	3403	0.0986	0.0880
1103	0.3392	0.2558	3404	0.2687	0.2334
1104	0.4054	0.3259	3405	0.1815	0.1612

Base Rates Effective January 1, 1989			Base Rates Effective January 1, 1989		
Class	Accident Fund	Medical Aid Fund	Class	Accident Fund	Medical Aid Fund
3406	0.1201	0.1473	4902	0.0264	0.0209
3407	0.2231	0.1589	4903	0.0355	0.0301
3408	0.0791	0.0660	4904	0.0112	0.0123
3409	0.1119	0.1136	4905	0.2094	0.2035
3501	0.5187	0.4145	4906	0.0358	0.0331
3503	0.2171	0.1713	4907	0.0675	0.0572
3506	0.5355	0.3152	4908	0.0648	0.1015
3508	0.3525	0.2781	4909	0.0648	0.1015
3602	0.0556	0.0531	5001	3.1244	2.0286
3603	0.4550	0.3623	5002	0.3796	0.2779
3604	0.8901	0.6403	5003	1.1477	0.7985
3605	0.2981	0.2411	5004	1.5543	1.0248
3701	0.2144	0.1569	5101	0.5391	0.3493
3702	0.3294	0.2176	5102	1.0408	0.6186
3707	0.2853	0.2008	5103	0.6461	0.4868
3708	0.1907	0.1751	5106	0.4609	0.4094
3801	0.1634	0.1278	5108	0.5043	0.4035
3802	0.1028	0.0912	5109	0.4325	0.2811
3808	0.1796	0.1426	5201	0.2280	0.1986
3901	0.1198	0.1033	5204	1.3424	0.5661
3902	0.4303	0.3096	5206	0.3007	0.1772
3903	0.7406	0.7127	5207	0.1080	0.1298
3905	0.0987	0.1058	5208	0.7660	0.5182
3906	0.3223	0.2101	5209	0.4395	0.3452
3909	0.1816	0.1737	5301	0.0151	0.0168
4002	0.4831	0.3576	5305	0.0194	0.0179
4101	0.1186	0.1198	5306	0.0232	0.0177
4103	0.2195	0.1733	5307	0.2430	0.1782
4107	0.0628	0.0645	6103	0.0235	0.0357
4108	0.1186	0.1198	6104	0.2041	0.1892
4109	0.1186	0.1198	6105	0.1827	0.1726
4201	0.2566	0.1726	6107	0.0788	0.0730
4301	0.6692	0.4460	6108	0.3862	0.3294
4302	0.5392	0.3767	6109	0.0267	0.0222
4304	0.4046	0.3707	6201	0.0990	0.0968
4305	0.9809	0.6973	6202	0.4495	0.3487
4401	0.3220	0.2454	6203	0.0683	0.0589
4402	0.5148	0.3862	6204	0.1076	0.1103
4404	0.4141	0.3147	6205	0.1076	0.1103
4501	0.1074	0.0767	6206	0.1076	0.1103
4502	0.0263	0.0202	6207	0.6421	0.6636
4504	0.0467	0.0615	6208	0.1554	0.1394
4601	0.3763	0.4404	6209	0.1590	0.1844
4802	0.2360	0.1840	6301	0.0856	0.0676
4803	0.2719	0.2022	6302	0.1178	0.0903
4804	0.4120	0.3743	6303	0.0334	0.0357
4805	0.2564	0.2208	6304	0.0873	0.0804
4806	0.0674	0.0512	6305	0.0350	0.0353
4808	0.3304	0.2778	6306	0.1649	0.1693
4809	0.1583	0.1604	6308	0.0300	0.0193
4810	0.1118	0.0925	6309	0.0700	0.0743
4811	0.2369	0.1698	6402	0.1844	0.1313
4812	0.2834	0.1988	6403	0.1030	0.1044
4901	0.0355	0.0301	6404	0.0783	0.0840

Workers' Compensation Insurance

296-17-895

Base Rates Effective January 1, 1989			Base Rates Effective January 1, 1989		
Class	Accident Fund	Medical Aid Fund	Class	Accident Fund	Medical Aid Fund
6405	0.4661	0.3221	7110	0.2359	0.1802
6406	0.0461	0.0542	7111	0.2359	0.1802
6407	0.1077	0.1178	7112	0.5186	0.3033
6408	0.2359	0.2078	7113	0.5186	0.3033
6409	0.2759	0.2574	7114	0.5186	0.3033
6501	0.0395	0.0379	7115	0.5186	0.3033
6502	0.0128	0.0135	7116	0.5186	0.3033
6503	0.0791	0.0508	7117	0.8915	0.9943
6504	0.1871	0.2534	7118	1.9733	1.1996
6505	0.1207	0.1305	7119	1.9733	1.1996
6506	0.0413	0.0418	7120	4.6053	3.3871
6508	0.2864	0.2502	7121	4.6053	3.3871
6509	0.1476	0.2027	7201	0.4559	0.2946
6601	0.1264	0.1238	7202	0.0286	0.0195
6602	0.3366	0.2772	7203	0.0773	0.0706
6603	0.1830	0.1632	7204		
6604	0.0528	0.0370	7301	0.4838	0.3252
6605	0.1509	0.1183	7302	0.3936	0.5346
6607	0.1080	0.1298	7307	0.5793	0.7106
6608	0.1988	0.1189	7308	0.1697	0.1496
6609	2.7739	3.2429	7309	0.0891	0.1193
6610	1.1999	1.4027			
6611	0.7428	0.8685			
6612	0.3874	0.4529			
6613	2.4884	2.4746			
6704	0.1232	0.1301			
6705	0.4570	0.5119			
6706	0.2261	0.2417			
6707	8.22*	10.40*			
6708	2.2429	3.1360			
6709	0.0891	0.1193			
6801	0.4124	0.2417			
6802	0.2517	0.2166			
6803	1.7596	0.4612			
6804	0.1767	0.1235			
6809	1.3296	2.0704			
6901		0.0582			
6902	0.4535	0.2321			
6903	4.1064	2.7848			
6904	0.1288	0.0972			
6905	0.1922	0.1524			
6906		0.1524			
6907	1.0590	0.6129			
6908	0.2185	0.1633			
6909	0.0429	0.0407			
7101	0.0226	0.0156			
7102	10.86*	24.77*			
7103	0.1527	0.1039			
7104	0.0151	0.0168			
7105	0.0338	0.0241			
7106	0.1844	0.1313			
7107	0.1844	0.1313			
7108	0.1844	0.1313			
7109	0.2359	0.1802			

*Daily rate. The daily rate shall be paid in full on any person for any calendar day in which any duties are performed that are incidental to the profession of the worker.

[Statutory Authority: RCW 51.16.035 and 51.04.020. 88-24-012 (Order 88-30), § 296-17-895, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 88-12-065 (Order 88-05), § 296-17-895, filed 5/31/88; 88-12-050 (Order 88-06), § 296-17-895, filed 5/31/88, effective 7/1/88; 88-06-047 (Order 87-33), § 296-17-895, filed 3/1/88; 87-24-060 (Order 87-26), § 296-17-895, filed 12/1/87, effective 1/1/88; 87-12-032 (Order 87-12), § 296-17-895, filed 5/29/87, effective 7/1/87. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 86-24-042 (Order 86-41), § 296-17-895, filed 11/26/86. Statutory Authority: RCW 51.16.035. 86-12-041 (Order 86-18), § 296-17-895, filed 5/30/86, effective 7/1/86; 85-24-032 (Order 85-33), § 296-17-895, filed 11/27/85, effective 1/1/86; 85-13-046 (Order 85-13), § 296-17-895, filed 6/17/85; 85-06-026 (Order 85-7), § 296-17-895, filed 2/28/85, effective 4/1/85; 84-24-016 (Order 84-23), § 296-17-895, filed 11/28/84, effective 1/1/85. Statutory Authority: RCW 51.04.020(1). 84-12-048 (Order 84-12), § 296-17-895, filed 6/1/84. Statutory Authority: RCW 51.16.035. 83-24-017 (Order 83-36), § 296-17-895, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-895, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-895, filed 11/30/81, effective 1/1/82; 81-04-024 (Order 81-02), § 296-17-895, filed 1/30/81; 80-17-016 (Order 80-23), § 296-17-895, filed 11/13/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-895, filed 11/30/79, effective 1/1/80. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 78-12-043 (Order 78-23), § 296-17-895, filed 11/27/78, effective 1/1/79; Order 77-27, § 296-17-895, filed 11/30/77, effective 1/1/78; Emergency Order 77-25, § 296-17-895, filed 12/1/77; Order 77-10, § 296-17-895, filed 5/31/77; Order 76-36, § 296-17-895, filed 11/30/76; Order 76-18, § 296-17-895, filed 5/28/76, effective 7/1/76; Order 75-38, § 296-17-895, filed 11/24/75, effective 1/1/76; Order 75-28, § 296-17-895, filed 8/29/75, effective 10/1/75; Order 74-40, § 296-17-895, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-895, filed 11/9/73, effective 1/1/74.]

WAC 296-17-904 Definitions. The definitions in this section shall apply throughout WAC 296-17-905 through 296-17-91902.

(1) "Coverage period" means a one-year period beginning the first day of either January, April, July, or October.

(2) "Group" means those members of an association who have elected to have a group dividend and/or retrospective premium calculated based on the combined premium and incurred loss data of the participants, and have satisfactorily complied with eligibility requirements for doing so.

(3) "Premium" means only that portion of the money collected from an employer for worker's compensation (not to include any money paid in penalties or security deposits), which is deposited in the accident fund and the medical aid fund.

(4) "Standard premium" for a particular coverage period means premium collected or due for insurance coverage provided during the period, prior to any adjustments under a dividend or retrospective rating plan.

(5) "Incurred losses" for a coverage period means the estimated ultimate cost to the accident fund and medical aid fund of claims arising from incidents occurring during the coverage period, subject to the special evaluation methods prescribed in WAC 296-17-915.

(6) "Loss development factor" means an actuarially determined factor which is multiplied times individual case basis estimates of claim costs to produce incurred losses for a firm or group of firms during a coverage period. Loss development factors allow for reopenings, aggravations, and any other individually unpredictable contingencies which may affect claim costs based on past experience of the accident fund and medical aid fund as a whole.

(7) "Loss ratio" means incurred losses divided by standard premium.

(8) "Dividend" is a partial refund of standard premium based on a firm's standard premium and loss ratio.

(9) "Retrospective premium" is a premium determined after a coverage period has ended, based on a firm's standard premium, incurred losses, and other pre-selected parameters for the coverage period.

(10) "Retrospective premium adjustment" is an additional assessment or refund of premium owing to an employer's retrospective premium as of a given evaluation date being more or less than the premium previously paid for the coverage period.

(11) "Performance adjustment factor" means an actuarially determined factor which is multiplied times incurred losses prior to application of the retrospective rating formula, to produce "adjusted incurred losses." This adjustment will produce net retrospective premium credits for employers and employer groups participating in the retrospective rating program when they have combined experience which is more favorable than other state fund experience. Conversely, this adjustment will produce net retrospective premium penalties for employers and employer groups participating in the retrospective rating program when their combined experience is

more adverse than other state fund experience. The purpose of the performance adjustment factor is to retain a consistent economic incentive for those employers to improve their accident cost experience while participating in these plans.

[Statutory Authority: RCW 51.04.020(1) and 51.16.035. 88-24-010 (Order 88-26), § 296-17-904, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 86-06-018 (Order 86-18), § 296-17-904, filed 2/25/86; 85-06-025 (Order 85-8), § 296-17-904, filed 2/28/85, effective 7/1/85; 81-04-024 (Order 81-02), § 296-17-904, filed 1/30/81.]

WAC 296-17-910 Qualifications for employer groups for workers' compensation insurance. The department may insure the workers' compensation obligations of employers as a group, provided the following conditions are met:

(1) All the employers in the group are members of an organization that has been in existence for at least two years.

(2) The organization was formed for a purpose other than that of obtaining workers' compensation coverage.

(3) The business of the employers in the organization is substantially similar, taking into consideration the nature of the work being performed by workers of such employers such that the group comprises substantially homogeneous risks.

(4) The employers in the group constitute at least fifty percent of the total eligible employers in such organization.

(5) The formation and operation of the group program in the organization will substantially improve accident prevention and claims handling for the employers in the group.

Each employer seeking to enroll in a group for workers' compensation insurance must have an industrial insurance account in good standing with the department such that at the time the agreement is processed no outstanding premiums, penalties or assessments are due and quarterly reporting of payroll has been made in accordance with WAC 296-17-310.

The above conditions do not pertain to groupings or combination of persons or risks by way of common ownership or common use and control for experience rating purposes. Combinations for experience rating are governed by WAC 296-17-873.

Final determination of group eligibility under this section rests with the department subject to review under chapter 51.52 RCW.

In providing employer group plans under this rule, the department may consider an employer group as a single employing entity for purposes of dividends or retrospective rating. No employer will be a member of more than one group for the purposes of insuring their workers' compensation obligations.

[Statutory Authority: RCW 51.04.020(1) and 51.16.035. 88-12-048 (Order 87-30), § 296-17-910, filed 5/31/88. Statutory Authority: RCW 51.16.035. 85-06-025 (Order 85-8), § 296-17-910, filed 2/28/85, effective 7/1/85; 84-06-024 (Order 84-2), § 296-17-910, filed 2/29/84, effective 7/1/84; 82-05-019 (Order 82-5), § 296-17-910, filed 2/10/82; 81-04-024 (Order 81-02), § 296-17-910, filed 1/30/81; Order 73-22, § 296-17-910, filed 11/9/73, effective 1/1/74.]

WAC 296-17-913 Qualifications for employer participation in a retrospective rating plan. The department may enroll interested employers in a retrospective rating plan as a means of insuring their workers' compensation obligations provided the following conditions are met:

(1) The employer submits a satisfactorily completed retrospective rating plan agreement for each employer account to be enrolled.

(2) The employer has an industrial insurance account in good standing with the department such that at the time the agreement is processed no outstanding premium, penalties or assessments are due and quarterly reporting of payroll has been made in accordance with WAC 296-17-310.

(3) The employer may be required to post a surety bond or other security deposit separate from the cash deposit required for establishing an industrial insurance account with the department:

(a) The employer's surety bond must be on the prescribed forms authorized by the department;

(b) The employer's surety bond shall be secured in one thousand dollar increments provided further that if the estimated maximum premium falls within two increment ranges, a surety bond at the higher level increment shall be obtained;

(c) The employer's surety bond shall remain in full force and effect for the period required retrospective premium calculations are made.

Such surety bond or security deposit would be sufficient to cover the difference between the employer's estimated standard premium and the maximum premium due under the retrospective rating plan. Past reporting data and current rate levels will be used to determine the estimated standard premium and maximum percentage retrospective premium due under the plan.

(4) The employer maintains any existing retrospective rating account in good standing with the department with no outstanding additional premium assessments or interest therein due at the time the agreement is processed. The department may at its discretion, determine that an employer is in good standing if the employer and the department agree upon a payment schedule or other arrangements satisfactory to the department for payment of additional premium assessments or interest due. Said payment schedule or other established satisfactory arrangements shall be made prior to the time the agreement is processed.

Final determination as to the employer's eligibility under this section and financial ability to assume the responsibilities under the retrospective rating plan rests with the department subject to review under chapter 51-52 RCW.

[Statutory Authority: RCW 51.04.020(1) and 51.16.035. 87-12-033 (Order 87-17), § 296-17-913, filed 5/29/87. Statutory Authority: RCW 51.16.035. 85-06-025 (Order 85-8), § 296-17-913, filed 2/28/85, effective 7/1/85; 84-06-024 (Order 84-2), § 296-17-913, filed 2/29/84, effective 7/1/84; 82-05-019 (Order 82-5), § 296-17-913, filed 2/10/82; 81-04-024 (Order 81-02), § 296-17-913, filed 1/30/81.]

WAC 296-17-914 Retrospective rating formula. Employers who elect to have their premium adjusted

under a retrospective rating plan must submit an application on a form provided by the department. This application must be received by the department no later than the 15th day of the month preceding the start of the coverage period. The employer must preselect a "maximum premium ratio" and either Plan A, A1, A2, A3, or B.

The employer's retrospective premium shall be calculated from the formula:

Retrospective Premium =

(Basic Premium Ratio x Standard Premium)

+

(Loss Conversion Factor x Adjusted Incurred Losses)

In the above formula, the basic premium ratio and loss conversion factor are taken from Plan A (WAC 296-17-91901) or Plan B (WAC 296-17-91902) or Plan A1 (WAC 296-17-91903) or Plan A2 (WAC 296-17-91904) or Plan A3 (WAC 296-17-91905) based on the employer's standard premium and preselected maximum premium ratio. Adjusted incurred losses equal incurred losses times the performance adjustment factor applicable to the coverage period. When the aggregate experience of retrospectively rated accounts is superior to other state fund experience, the performance adjustment factor will not exceed 1.00. The performance adjustment factor for each coverage period shall be calculated independently of results for previous coverage periods. Evaluation of incurred losses will be done according to the methods prescribed in WAC 296-17-915.

The maximum retrospective premium is the product of the maximum premium ratio times the employer's standard premium. In the event that the retrospective premium formula produces a value greater than the maximum premium, the retrospective premium shall be reduced to the maximum premium.

Under Plans A1, A2, and A3, the minimum retrospective premium is the product of the minimum premium ratio times the employer's standard premium. If the retrospective premium formula produces a value less than the minimum premium, the retrospective premium shall be increased to the minimum premium.

Under Plan A, a firm may elect to forego the protection of a maximum premium ratio if its financial condition is sufficiently strong and stable so that it could qualify as a self-insurer under the department's guidelines for certification of self-insurers. The basic premium ratio effective January 1, 1989, will be .058 if the firm selects and qualifies for an unlimited maximum premium.

[Statutory Authority: RCW 51.04.020(1) and 51.16.035. 88-24-010 (Order 88-26), § 296-17-914, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 86-06-018 (Order 86-18), § 296-17-914, filed 2/25/86; 85-06-025 (Order 85-8), § 296-17-914, filed 2/28/85, effective 7/1/85; 84-06-024 (Order 84-2), § 296-17-914, filed 2/29/84, effective 7/1/84; 83-05-018 (Order 83-4), § 296-17-914, filed 2/9/83, effective 7/1/83; 82-05-019 (Order 82-5), § 296-17-914, filed 2/10/82; 81-04-024 (Order 81-02), § 296-17-914, filed 1/30/81.]

WAC 296-17-915 Evaluation of incurred losses dividend and retrospective rating plans. The initial evaluation date for each claim arising from incidents occurring during the coverage period shall be approximately twelve months following the end of the coverage period. Each subsequent annual incurred loss evaluation under the retrospective rating plan shall be approximately twelve months following the preceding evaluation date.

The estimated cost of each claim shall include all payments made as of the valuation date and may also include a reserve for future payments consistent with the following evaluation methods applicable to experience rating:

(1) Retroactive adjustments - revision of losses between valuation dates

No claim value shall be revised between valuation dates and no retroactive adjustment of a retrospective premium adjustment shall be made because of dispute concerning the judgment of the claims examiner or because of subsequent developments except as specifically provided in the following cases:

- (a) In cases where incurred loss values are included or excluded through mistake other than error of judgment;
- (b) In cases where a third party recovery is made;
- (c) In cases where the claim qualifies as a second injury claim under the provisions of RCW 51.16.120.

(2) Third party recovery

In the event of a third party recovery on a claim, the employer shall be charged for a portion of the actual loss amount, gross of such recovery, established on the claim. This portion shall be calculated at the time the recovery is made, and shall be determined by taking the ratio of the total cost of the claim, including attorneys' fees, after recovery, to the total cost of the claim before recovery. If the claim is open at the time the recovery is made, then costs before and after recovery may include an allowance for future claim payments.

(3) Second injury claims

The value of any claim which becomes eligible for second injury relief under the provisions of RCW 51.16.120, as now or hereafter amended, shall be reduced by the percentage of relief granted.

The incurred losses for each employer shall be determined by multiplying the individual claim cost estimates by loss development factors, and adding the resulting developed losses for all the employer's claims. The following special procedures will be used for making individual claim cost estimates:

Fatal claims - retrospective rating plan

Each fatal claim shall include all payments made as of the valuation date and a pension reserve, if any, based on the annuity value at the time the pension is awarded. Pension costs will not be reevaluated based on events after the pension has been awarded.

Fatal claims - dividend plan

Each fatal claim shall be assigned the "average death value," said value to be the average incurred cost for all fatal claims occurring during the coverage period.

Permanent total claims

Pension costs for permanent total injuries will be based on the annuity value at the time that the pension

is awarded. Pension costs will not be reevaluated based on events after the pension has been awarded.

Occupational disease claims

The cost of any occupational disease claim paid and arising from exposure to the disease hazard under two or more employers, shall be prorated to each period of employment. Each employer's share of the claim cost shall be assigned to the coverage period during which the employer last employed the claimant under conditions of injurious exposure, provided the employer's share is at least ten percent of the total claim cost.

[Statutory Authority: RCW 51.04.020(1) and 51.16.035. 88-24-010 (Order 88-26), § 296-17-915, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 85-06-025 (Order 85-8), § 296-17-915, filed 2/28/85, effective 7/1/85; 83-05-018 (Order 83-4), § 296-17-915, filed 2/9/83, effective 7/1/83; 82-05-019 (Order 82-5), § 296-17-915, filed 2/10/82; 81-04-024 (Order 81-02), § 296-17-915, filed 1/30/81.]

WAC 296-17-916 Retrospective premium adjustments—Due and payable. The initial retrospective premium adjustment will be calculated approximately twelve months from the close of the coverage period and annually thereafter for a period of two years. Provided a request is made within ninety days following promulgation of the third and final required retrospective premium adjustment by the employer or employer group up to two subsequent annual retrospective premium adjustments on the coverage period will be made. The additional adjustments will be identified as the fourth and fifth adjustments and must be requested and made in succession.

Retrospective premium adjustments are the sole responsibility of the employer or employer group. Retrospective premium adjustments become due or payable within sixty days of notification of amount. Reevaluation of incurred losses or premium audits will not delay retrospective premium adjustment payments. For employers participating on an individual retrospective rating plan, no retrospective premium adjustment refund check will be written for less than ten dollars. In lieu of refund checks, retrospective premium adjustments of less than ten dollars will be credited to the employer's industrial insurance account. Retrospective premium adjustments of less than five dollars will be disregarded and not considered due or payable.

The department may withhold any member's pro rata share from the group's retrospective premium adjustment refund and credit the employer's industrial insurance account when premiums, penalties, or assessments are owing the department. For employers participating in an individual retrospective rating plan, retrospective premium adjustment refunds may be credited to the employer's industrial insurance account when premiums, penalties, or assessments are owing the department.

[Statutory Authority: RCW 51.04.020(1) and 51.16.035. 88-24-010 (Order 88-26), § 296-17-916, filed 12/1/88, effective 1/1/89; 88-12-048 (Order 87-30), § 296-17-916, filed 5/31/88. Statutory Authority: RCW 51.16.035. 86-06-018 (Order 86-18), § 296-17-916, filed 2/25/86; 85-06-025 (Order 85-8), § 296-17-916, filed 2/28/85, effective 7/1/85; 84-06-024 (Order 84-2), § 296-17-916, filed 2/29/84, effective 7/1/84; 83-05-018 (Order 83-4), § 296-17-916,

filed 2/9/83, effective 7/1/83; 81-04-024 (Order 81-02), § 296-17-916, filed 1/30/81.]

WAC 296-17-91601 Ninety-day open option. Employer or employer groups that have enrolled for coverage periods beginning July 1, 1984, through July 1, 1988, may elect to eliminate the required fourth and fifth retrospective premium adjustment under WAC 296-17-916 by giving written notification to the department of labor and industries no later than September 30, 1988.

Employer or employer groups that have elected to eliminate the required fourth and fifth annual retrospective premium adjustments may request optional fourth and fifth retrospective premium adjustments as described in WAC 296-17-916 as amended July 1, 1988.

[Statutory Authority: RCW 51.04.020(1) and 51.16.035. 88-12-049 (Order 88-08), § 296-17-91601, filed 5/31/88.]

WAC 296-17-917 Qualifications for employer group participation in retrospective rating plan. The department may enroll interested groups in the retrospective rating plan provided:

(1) Employers qualify as a group as defined by WAC 296-17-910.

(2) Employers have industrial insurance accounts in good standing with the department such that at the time the agreement is processed no outstanding premium, penalties, or assessments are due and quarterly reporting of payroll has been made in accordance with WAC 296-17-310.

(3) Group submits a satisfactorily completed:

(a) Application for group retrospective rating plan no later than:

(i) April 30 for the coverage period beginning the following July 1;

(ii) July 31 for the coverage period beginning the following October 1;

(iii) October 31 for the coverage period beginning the following January 1;

(iv) January 31 for the coverage period beginning the following April 1.

(b) Employer's authorization for release of insurance data and group membership enrollment application for each employer account to be enrolled by the 15th day of the month preceding the start of the coverage period;

(c) Group retrospective rating plan agreement by the 15th day of the month preceding the start of the coverage period.

(4) The group may be required to post a surety bond or other security deposit separate from the individual employer's cash deposits required for establishing industrial insurance accounts with the department:

(a) The group's surety bond must be on the prescribed forms authorized by the department;

(b) The group's surety bond shall be secured in one thousand dollar increments provided further that if the group's estimated maximum premium due falls within two increment ranges, a surety bond at the higher level increment shall be obtained;

(c) The group's surety bond shall remain in force and effect for the period required retrospective premium calculations are made.

The amount of such surety bond or other security deposit, if required, may be fixed by the department in any amount equal to or less than the difference between the group's estimated standard premium and the maximum premium due under the retrospective rating plan. Past reporting data and current rate levels will be used to determine the estimated standard premium and maximum percentage retrospective premium due under the plan.

Each employer included as a group member in the group retrospective rating plan agreement will maintain an individual account with the department and will continue to pay quarterly premiums based on assigned risk classification(s) and individual experience rating.

Employers associated with the group at any time during the term of the group retrospective rating plan agreement will remain parties to the agreement for the balance of its term.

Members of the organization or association which do not elect to participate in the group retrospective rating plan at the inception of the agreement shall not become participating members in the group during the term of the agreement.

(5) The group maintains any existing retrospective rating account in good standing with the department with no outstanding additional premium assessment or interest therein due at the time the agreement is processed. The department may at its discretion, determine that a group is in good standing if the group and the department agree upon a payment schedule or other arrangements satisfactory to the department for payment of additional premium assessments or interest due. Said payment schedule or other established satisfactory arrangements shall be made prior to the time the agreement is processed.

Final determination of an employer's eligibility to participate in a group plan under this section rests with the department subject to review under chapter 51.52 RCW.

The payment of the group retrospective premium adjustment will be made to or collected from the association. The distribution to the individual group members or collection from the individual group members will be done by the association.

Group retrospective premium adjustment will be calculated according to WAC 296-17-914 and is subject to WAC 296-17-915 and 296-17-916.

[Statutory Authority: RCW 51.04.020(1) and 51.16.035. 87-12-033 (Order 87-17), § 296-17-917, filed 5/29/87. Statutory Authority: RCW 51.16.035. 86-06-018 (Order 86-18), § 296-17-917, filed 2/25/86; 85-06-025 (Order 85-8), § 296-17-917, filed 2/28/85, effective 7/1/85; 84-06-024 (Order 84-2), § 296-17-917, filed 2/29/84, effective 7/1/84; 83-05-018 (Order 83-4), § 296-17-917, filed 2/9/83, effective 7/1/83; 82-05-019 (Order 82-5), § 296-17-917, filed 2/10/82; 81-04-024 (Order 81-02), § 296-17-917, filed 1/30/81.]

RETROSPECTIVE RATING PLANS A, A1, A2, A3, AND B
STANDARD PREMIUM SIZE RANGES
Effective January 1, 1989

Size Group Number	Standard Premium Range
84	\$ 3,090 - \$ 3,564
83	3,565 - 4,092
82	4,093 - 4,677
81	4,678 - 5,326
80	5,327 - 6,042
79	6,043 - 6,833
78	6,834 - 7,702
77	7,703 - 8,657
76	8,658 - 9,705
75	9,706 - 10,853
74	10,854 - 12,108
73	12,109 - 13,479
72	13,480 - 14,973
71	14,974 - 16,601
70	16,602 - 18,372
69	18,373 - 20,296
68	20,297 - 20,855
67	20,856 - 22,027
66	22,028 - 23,284
65	23,285 - 24,634
64	24,635 - 26,085
63	26,086 - 27,647
62	27,648 - 29,330
61	29,331 - 31,145
60	31,146 - 33,106
59	33,107 - 35,227
58	35,228 - 37,524
57	37,525 - 40,015
56	40,016 - 42,720
55	42,721 - 45,662
54	45,663 - 48,867
53	48,868 - 52,364
52	52,365 - 56,187
51	56,188 - 60,371
50	60,372 - 64,960
49	64,961 - 70,003
48	70,004 - 75,555
47	75,556 - 81,679
46	81,680 - 88,450
45	88,451 - 95,952
44	95,953 - 101,375
43	101,376 - 108,043
42	108,044 - 115,324

Size Group Number	Standard Premium Range
41	115,325 - 123,292
40	123,293 - 132,030
39	132,031 - 141,636
38	141,637 - 152,223
37	152,224 - 163,920
36	163,921 - 176,879
35	176,880 - 191,278
34	191,279 - 207,326
33	207,327 - 225,269
32	225,270 - 245,402
31	245,403 - 268,072
30	268,073 - 293,702
29	293,703 - 322,796
28	322,797 - 355,972
27	355,973 - 393,983
26	393,984 - 437,757
25	437,758 - 488,450
24	488,451 - 547,509
23	547,510 - 616,761
22	616,762 - 698,547
21	698,548 - 795,884
20	795,885 - 912,721
19	912,722 - 1,054,287
18	1,054,288 - 1,227,609
17	1,227,610 - 1,442,287
16	1,442,288 - 1,605,217
15	1,605,218 - 1,791,116
14	1,791,117 - 1,998,872
13	1,998,873 - 2,331,328
12	2,331,329 - 2,741,317
11	2,741,318 - 3,596,498
10	3,596,499 - 4,908,374
9	4,908,375 - 6,392,344
8	6,392,345 - 8,635,786
7	8,635,787 - 12,168,325
6	12,168,326 - 18,231,896
5	18,231,897 & over

[Statutory Authority: RCW 51.04.020(1) and 51.16.035. 88-24-010 (Order 88-26), § 296-17-919, filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.16.035. 86-06-018 (Order 86-18), § 296-17-919, filed 2/25/86; 85-06-025 (Order 85-8), § 296-17-919, filed 2/28/85, effective 7/1/85; 84-06-024 (Order 84-2), § 296-17-919, filed 2/29/84, effective 7/1/84; 83-05-018 (Order 83-4), § 296-17-919, filed 2/9/83, effective 7/1/83; 82-05-019 (Order 82-5), § 296-17-919, filed 2/10/82; 81-24-042 (Order 81-30), § 296-17-919, filed 11/30/81, effective 1/1/82; 81-04-024 (Order 81-02), § 296-17-919, filed 1/30/81.]

WAC 296-17-91901 Table II.

RETROSPECTIVE RATING PLAN A
 BASIC PREMIUM RATIOS
 LOSS CONVERSION FACTOR = .729
 Effective January 1, 1989

Maximum Premium Ratio:	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
Size Group														
84	.976	.957	.941	.929	.918	.908	.900	.892	.886	.879	.867	.857	.847	.828
83	.973	.953	.937	.923	.912	.902	.893	.885	.878	.871	.858	.847	.836	.817
82	.971	.949	.932	.917	.905	.895	.886	.877	.870	.862	.849	.838	.826	.806
81	.968	.945	.927	.912	.899	.888	.878	.870	.862	.854	.840	.828	.816	.795
80	.966	.941	.921	.906	.893	.881	.871	.862	.853	.846	.831	.818	.806	.783
79	.963	.937	.916	.900	.886	.874	.863	.854	.845	.837	.822	.808	.795	.771
78	.960	.933	.912	.894	.880	.867	.856	.846	.836	.828	.812	.798	.784	.759
77	.958	.929	.907	.889	.874	.860	.849	.838	.828	.819	.802	.787	.773	.746
76	.956	.925	.902	.883	.867	.853	.841	.829	.819	.810	.792	.776	.761	.734
75	.953	.921	.896	.876	.860	.845	.832	.821	.810	.800	.782	.766	.750	.722
74	.950	.916	.891	.870	.853	.838	.825	.812	.801	.791	.772	.754	.738	.709
73	.947	.912	.885	.864	.846	.830	.816	.804	.792	.781	.762	.743	.727	.696
72	.943	.907	.880	.858	.839	.823	.808	.795	.783	.772	.751	.732	.715	.682
71	.940	.902	.874	.851	.832	.815	.800	.786	.774	.762	.740	.721	.702	.669
70	.937	.897	.868	.844	.824	.807	.791	.777	.764	.752	.730	.709	.690	.656
69	.933	.892	.862	.837	.817	.799	.783	.768	.754	.742	.719	.698	.678	.643
68	.929	.886	.855	.830	.808	.790	.773	.758	.744	.731	.707	.686	.666	.630
67	.925	.880	.848	.822	.800	.781	.764	.748	.734	.721	.696	.674	.654	.618
66	.920	.875	.841	.814	.792	.772	.754	.738	.723	.710	.685	.662	.641	.604
65	.916	.869	.834	.807	.783	.763	.745	.728	.713	.699	.673	.649	.628	.590
64	.911	.863	.827	.799	.775	.754	.735	.718	.702	.688	.661	.637	.615	.576
63	.907	.856	.820	.791	.766	.745	.725	.708	.692	.677	.649	.625	.602	.563
62	.902	.850	.813	.783	.757	.735	.715	.698	.681	.666	.638	.612	.590	.550
61	.897	.844	.805	.774	.748	.726	.705	.687	.670	.654	.625	.600	.577	.536
60	.892	.838	.798	.766	.739	.716	.695	.676	.658	.642	.613	.587	.563	.522
59	.888	.831	.790	.758	.730	.706	.684	.665	.647	.630	.600	.574	.550	.508
58	.883	.825	.783	.749	.720	.696	.674	.654	.635	.618	.588	.561	.537	.495
57	.878	.818	.775	.740	.711	.686	.663	.643	.624	.607	.576	.548	.524	.482
56	.872	.810	.766	.731	.701	.675	.652	.631	.612	.594	.563	.535	.511	.468
55	.865	.802	.757	.721	.690	.664	.640	.619	.599	.582	.550	.522	.497	.455
54	.858	.794	.747	.710	.679	.652	.628	.607	.587	.569	.537	.509	.484	.442
53	.851	.785	.738	.700	.668	.641	.616	.595	.575	.556	.524	.496	.471	.429
52	.843	.776	.728	.690	.657	.629	.605	.582	.562	.544	.511	.483	.458	.417
51	.836	.767	.718	.679	.646	.618	.592	.570	.550	.531	.498	.470	.446	.405
50	.828	.758	.708	.668	.634	.605	.580	.557	.537	.518	.485	.457	.432	.392
49	.821	.748	.697	.656	.622	.593	.567	.544	.524	.505	.472	.444	.419	.379
48	.813	.739	.686	.645	.610	.581	.555	.531	.511	.492	.459	.431	.406	.367
47	.804	.729	.675	.633	.598	.568	.542	.519	.498	.479	.446	.418	.394	.355
46	.796	.718	.663	.620	.584	.554	.528	.505	.484	.465	.433	.406	.382	.344
45	.787	.707	.650	.607	.571	.541	.514	.491	.471	.452	.420	.394	.371	.334
44	.778	.695	.638	.594	.557	.527	.501	.478	.458	.440	.408	.382	.360	.324
43	.768	.683	.625	.580	.544	.514	.488	.465	.445	.427	.396	.371	.349	.314
42	.758	.671	.612	.567	.530	.500	.474	.451	.431	.413	.383	.357	.336	.301
41	.748	.659	.599	.554	.517	.486	.460	.437	.417	.399	.368	.343	.322	.288
40	.737	.647	.586	.540	.503	.472	.446	.423	.403	.385	.355	.330	.309	.276
39	.726	.635	.573	.526	.489	.458	.432	.409	.389	.372	.342	.317	.296	.264
38	.714	.622	.560	.513	.476	.445	.418	.396	.376	.359	.329	.305	.284	.252
37	.702	.608	.546	.499	.462	.431	.405	.383	.363	.346	.317	.293	.273	.242
36	.688	.594	.532	.485	.448	.417	.392	.369	.350	.333	.304	.281	.262	.231
35	.673	.578	.516	.469	.433	.402	.377	.355	.336	.320	.292	.269	.250	.221
34	.657	.562	.500	.454	.418	.388	.363	.342	.323	.307	.280	.258	.240	.211
33	.640	.546	.484	.439	.403	.374	.349	.329	.310	.295	.268	.247	.229	.202
32	.623	.529	.468	.424	.389	.360	.336	.316	.298	.283	.257	.237	.220	.193
31	.607	.512	.452	.408	.373	.345	.322	.302	.285	.270	.246	.226	.210	.185
30	.589	.495	.435	.392	.358	.331	.308	.289	.273	.259	.235	.216	.201	.178
29	.571	.478	.419	.377	.344	.317	.295	.277	.261	.247	.225	.207	.193	.171
28	.553	.461	.403	.361	.329	.303	.282	.264	.248	.235	.213	.195	.181	.160
27	.537	.446	.388	.346	.314	.288	.267	.248	.233	.219	.197	.179	.165	.143
26	.521	.430	.373	.331	.299	.273	.252	.234	.218	.205	.183	.165	.151	.129
25	.504	.414	.358	.317	.285	.259	.238	.220	.205	.192	.170	.152	.138	.117
24	.482	.394	.339	.300	.269	.245	.225	.208	.194	.181	.161	.145	.132	.113

Maximum Premium Ratio:	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
Size Group														
23	.460	.374	.321	.283	.254	.231	.213	.197	.184	.172	.153	.138	.127	.109
22	.437	.355	.304	.268	.241	.219	.201	.187	.174	.163	.146	.132	.121	.105
21	.414	.336	.288	.254	.228	.208	.191	.177	.166	.156	.139	.127	.117	.102
20	.394	.318	.272	.239	.214	.194	.179	.166	.155	.145	.130	.119	.110	.096
19	.377	.301	.254	.222	.198	.179	.164	.152	.142	.133	.120	.109	.101	.089
18	.358	.283	.238	.207	.184	.166	.152	.140	.131	.123	.110	.101	.094	.083
17	.339	.266	.222	.192	.171	.154	.140	.130	.121	.114	.103	.094	.088	.079
16	.320	.249	.208	.179	.159	.143	.131	.121	.113	.106	.096	.088	.083	.075
15	.303	.234	.194	.168	.148	.134	.122	.113	.106	.100	.091	.084	.079	.072
14	.293	.220	.180	.157	.141	.128	.117	.109	.103	.097	.089	.082	.078	.071
13	.281	.204	.167	.148	.133	.122	.112	.105	.099	.094	.086	.081	.076	.070
12	.269	.187	.156	.139	.126	.116	.108	.101	.096	.091	.084	.079	.075	.069
11	.254	.167	.145	.130	.119	.110	.103	.097	.092	.088	.082	.077	.073	.068
10	.238	.150	.135	.122	.113	.105	.098	.093	.089	.085	.079	.075	.072	.067
9	.219	.138	.125	.115	.106	.100	.094	.089	.085	.082	.077	.073	.071	.066
8	.197	.127	.116	.107	.100	.094	.090	.086	.082	.079	.075	.072	.069	.065
7	.170	.117	.108	.100	.094	.089	.085	.082	.079	.077	.073	.070	.068	.064
6	.137	.107	.100	.094	.089	.085	.081	.078	.076	.074	.071	.068	.066	.064
5	.105	.098	.092	.087	.083	.080	.077	.075	.073	.071	.068	.066	.065	.063

[Statutory Authority: RCW 51.04.020(1) and 51.16.035. 88-24-010 (Order 88-26), § 296-17-91901, filed 12/1/88, effective 1/1/89; 88-14-107 (Order 88-10), § 296-17-91901, filed 7/6/88; 86-17-002 (Order 86-29), § 296-17-91901, filed 8/8/86. Statutory Authority: RCW 51.16.035. 86-06-018 (Order 86-18), § 296-17-91901, filed 2/25/86; 85-06-025 (Order 85-8), § 296-17-91901, filed 2/28/85, effective 7/1/85; 84-06-024 (Order 84-2), § 296-17-91901, filed 2/29/84, effective 7/1/84; 83-05-018 (Order 83-4), § 296-17-91901, filed 2/9/83, effective 7/1/83; 82-05-019 (Order 82-5), § 296-17-91901, filed 2/10/82; 81-04-024 (Order 81-02), § 296-17-91901, filed 1/30/81.]

WAC 296-17-91902 Table III.

RETROSPECTIVE RATING PLAN B
BASIC PREMIUM RATIOS
AND LOSS CONVERSION FACTORS
Effective January 1, 1989

Maximum Premium Ratio:	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
Size Group														
84 Basic Premium Ratio	.999	.997	.996	.994	.993	.991	.990	.988	.987	.985	.982	.979	.976	.970
84 Loss Conversion Factor	.001	.003	.004	.006	.007	.009	.010	.012	.013	.015	.018	.021	.024	.030
83 Basic Premium Ratio	.998	.997	.995	.993	.992	.990	.989	.987	.985	.984	.980	.977	.974	.967
83 Loss Conversion Factor	.002	.003	.005	.007	.008	.010	.011	.013	.015	.016	.020	.023	.026	.033
82 Basic Premium Ratio	.998	.996	.995	.993	.991	.989	.988	.986	.984	.982	.979	.975	.972	.965
82 Loss Conversion Factor	.002	.004	.005	.007	.009	.011	.012	.014	.016	.018	.021	.025	.028	.035
81 Basic Premium Ratio	.998	.996	.994	.992	.990	.989	.987	.985	.983	.981	.977	.973	.969	.962
81 Loss Conversion Factor	.002	.004	.006	.008	.010	.011	.013	.015	.017	.019	.023	.027	.031	.038
80 Basic Premium Ratio	.998	.996	.994	.992	.990	.988	.986	.984	.982	.980	.976	.972	.967	.959
80 Loss Conversion Factor	.002	.004	.006	.008	.010	.012	.014	.016	.018	.020	.024	.028	.033	.041
79 Basic Premium Ratio	.998	.996	.994	.991	.989	.987	.985	.983	.981	.979	.974	.970	.966	.957
79 Loss Conversion Factor	.002	.004	.006	.009	.011	.013	.015	.017	.019	.021	.026	.030	.034	.043
78 Basic Premium Ratio	.998	.995	.993	.991	.988	.986	.984	.981	.979	.977	.972	.967	.963	.953
78 Loss Conversion Factor	.002	.005	.007	.009	.012	.014	.016	.019	.021	.023	.028	.033	.037	.047
77 Basic Premium Ratio	.997	.995	.992	.990	.987	.984	.982	.979	.977	.974	.969	.964	.958	.948
77 Loss Conversion Factor	.003	.005	.008	.010	.013	.016	.018	.021	.023	.026	.031	.036	.042	.052
76 Basic Premium Ratio	.997	.995	.992	.989	.987	.984	.981	.978	.976	.973	.968	.962	.957	.946
76 Loss Conversion Factor	.003	.005	.008	.011	.013	.016	.019	.022	.024	.027	.032	.038	.043	.054
75 Basic Premium Ratio	.997	.994	.992	.989	.986	.983	.981	.978	.975	.972	.967	.961	.956	.945
75 Loss Conversion Factor	.003	.006	.008	.011	.014	.017	.019	.022	.025	.028	.033	.039	.044	.055
74 Basic Premium Ratio	.997	.994	.991	.988	.985	.982	.979	.976	.973	.970	.964	.958	.952	.940
74 Loss Conversion Factor	.003	.006	.009	.012	.015	.018	.021	.024	.027	.030	.036	.042	.048	.060

Workers' Compensation Insurance

296-17-91902

Maximum Premium Ratio:		1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
73	Basic Premium Ratio	.997	.994	.990	.987	.984	.981	.977	.974	.971	.968	.961	.955	.948	.936
	Loss Conversion Factor	.003	.006	.010	.013	.016	.019	.023	.026	.029	.032	.039	.045	.052	.064
72	Basic Premium Ratio	.996	.993	.989	.986	.982	.979	.975	.972	.968	.965	.957	.950	.943	.929
	Loss Conversion Factor	.004	.007	.011	.014	.018	.021	.025	.028	.032	.035	.043	.050	.057	.071
71	Basic Premium Ratio	.996	.992	.988	.984	.980	.976	.972	.969	.965	.961	.953	.945	.937	.921
	Loss Conversion Factor	.004	.008	.012	.016	.020	.024	.028	.031	.035	.039	.047	.055	.063	.079
70	Basic Premium Ratio	.996	.991	.987	.983	.978	.974	.970	.965	.961	.957	.948	.939	.931	.913
	Loss Conversion Factor	.004	.009	.013	.017	.022	.026	.030	.035	.039	.043	.052	.061	.069	.087
69	Basic Premium Ratio	.995	.991	.986	.981	.977	.972	.967	.963	.958	.953	.944	.935	.925	.907
	Loss Conversion Factor	.005	.009	.014	.019	.023	.028	.033	.037	.042	.047	.056	.065	.075	.093
68	Basic Premium Ratio	.995	.990	.985	.981	.976	.971	.966	.961	.956	.952	.942	.932	.923	.903
	Loss Conversion Factor	.005	.010	.015	.019	.024	.029	.034	.039	.044	.048	.058	.068	.077	.097
67	Basic Premium Ratio	.995	.990	.985	.980	.975	.970	.965	.959	.954	.949	.939	.929	.919	.899
	Loss Conversion Factor	.005	.010	.015	.020	.025	.030	.035	.041	.046	.051	.061	.071	.081	.101
66	Basic Premium Ratio	.995	.989	.984	.978	.973	.967	.962	.956	.951	.946	.935	.924	.913	.891
	Loss Conversion Factor	.005	.011	.016	.022	.027	.033	.038	.044	.049	.054	.065	.076	.087	.109
65	Basic Premium Ratio	.994	.988	.982	.976	.971	.965	.959	.953	.947	.941	.929	.917	.906	.882
	Loss Conversion Factor	.006	.012	.018	.024	.029	.035	.041	.047	.053	.059	.071	.083	.094	.118
64	Basic Premium Ratio	.994	.987	.981	.974	.968	.962	.955	.949	.942	.936	.923	.910	.898	.872
	Loss Conversion Factor	.006	.013	.019	.026	.032	.038	.045	.051	.058	.064	.077	.090	.102	.128
63	Basic Premium Ratio	.993	.986	.979	.972	.965	.958	.951	.944	.938	.931	.917	.903	.889	.861
	Loss Conversion Factor	.007	.014	.021	.028	.035	.042	.049	.056	.062	.069	.083	.097	.111	.139
62	Basic Premium Ratio	.992	.985	.977	.970	.962	.954	.947	.939	.931	.924	.909	.893	.878	.848
	Loss Conversion Factor	.008	.015	.023	.030	.038	.046	.053	.061	.069	.076	.091	.107	.122	.152
61	Basic Premium Ratio	.992	.983	.975	.967	.959	.950	.942	.934	.926	.917	.901	.884	.868	.835
	Loss Conversion Factor	.008	.017	.025	.033	.041	.050	.058	.066	.074	.083	.099	.116	.132	.165
60	Basic Premium Ratio	.991	.982	.973	.964	.955	.946	.937	.928	.919	.910	.892	.874	.856	.819
	Loss Conversion Factor	.009	.018	.027	.036	.045	.054	.063	.072	.081	.090	.108	.126	.144	.181
59	Basic Premium Ratio	.990	.980	.971	.961	.951	.941	.931	.921	.912	.902	.882	.862	.843	.803
	Loss Conversion Factor	.010	.020	.029	.039	.049	.059	.069	.079	.088	.098	.118	.138	.157	.197
58	Basic Premium Ratio	.989	.979	.968	.957	.947	.936	.926	.915	.904	.894	.872	.851	.830	.787
	Loss Conversion Factor	.011	.021	.032	.043	.053	.064	.074	.085	.096	.106	.128	.149	.170	.213
57	Basic Premium Ratio	.989	.977	.966	.954	.943	.931	.920	.908	.897	.886	.863	.840	.817	.771
	Loss Conversion Factor	.011	.023	.034	.046	.057	.069	.080	.092	.103	.114	.137	.160	.183	.229
56	Basic Premium Ratio	.988	.976	.963	.951	.939	.927	.914	.902	.890	.878	.853	.829	.805	.756
	Loss Conversion Factor	.012	.024	.037	.049	.061	.073	.086	.098	.110	.122	.147	.171	.195	.244
55	Basic Premium Ratio	.987	.974	.961	.948	.935	.922	.909	.896	.883	.870	.844	.818	.792	.741
	Loss Conversion Factor	.013	.026	.039	.052	.065	.078	.091	.104	.117	.130	.156	.182	.208	.259
54	Basic Premium Ratio	.986	.972	.959	.945	.931	.917	.904	.890	.876	.862	.835	.807	.780	.724
	Loss Conversion Factor	.014	.028	.041	.055	.069	.083	.096	.110	.124	.138	.165	.193	.220	.276
53	Basic Premium Ratio	.985	.971	.956	.941	.927	.912	.898	.883	.868	.854	.824	.795	.766	.707
	Loss Conversion Factor	.015	.029	.044	.059	.073	.088	.102	.117	.132	.146	.176	.205	.234	.293
52	Basic Premium Ratio	.984	.969	.953	.938	.922	.907	.891	.876	.860	.845	.814	.783	.752	.690
	Loss Conversion Factor	.016	.031	.047	.062	.078	.093	.109	.124	.140	.155	.186	.217	.248	.310
51	Basic Premium Ratio	.983	.967	.950	.934	.917	.901	.884	.868	.851	.835	.802	.769	.735	.669
	Loss Conversion Factor	.017	.033	.050	.066	.083	.099	.116	.132	.149	.165	.198	.231	.265	.331
50	Basic Premium Ratio	.982	.965	.947	.929	.911	.894	.876	.858	.841	.823	.787	.752	.717	.646
	Loss Conversion Factor	.018	.035	.053	.071	.089	.106	.124	.142	.159	.177	.213	.248	.283	.354
49	Basic Premium Ratio	.981	.962	.943	.924	.905	.886	.867	.848	.829	.810	.772	.734	.696	.621
	Loss Conversion Factor	.019	.038	.057	.076	.095	.114	.133	.152	.171	.190	.228	.266	.304	.379
48	Basic Premium Ratio	.980	.959	.939	.919	.898	.878	.858	.837	.817	.797	.756	.716	.675	.594
	Loss Conversion Factor	.020	.041	.061	.081	.102	.122	.142	.163	.183	.203	.244	.284	.325	.406
47	Basic Premium Ratio	.978	.957	.935	.913	.891	.870	.848	.826	.805	.783	.740	.696	.653	.566
	Loss Conversion Factor	.022	.043	.065	.087	.109	.130	.152	.174	.195	.217	.260	.304	.347	.434

Maximum Premium Ratio:		1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
Size Group															
46	Basic Premium Ratio	.977	.954	.931	.908	.885	.862	.839	.816	.793	.770	.724	.677	.631	.539
	Loss Conversion Factor	.023	.046	.069	.092	.115	.138	.161	.184	.207	.230	.276	.323	.369	.461
45	Basic Premium Ratio	.976	.951	.927	.902	.878	.854	.829	.805	.780	.756	.707	.658	.609	.512
	Loss Conversion Factor	.024	.049	.073	.098	.122	.146	.171	.195	.220	.244	.293	.342	.391	.488
44	Basic Premium Ratio	.974	.948	.922	.897	.871	.845	.819	.793	.767	.742	.690	.638	.587	.483
	Loss Conversion Factor	.026	.052	.078	.103	.129	.155	.181	.207	.233	.258	.310	.362	.413	.517
43	Basic Premium Ratio	.973	.945	.918	.891	.863	.836	.809	.781	.754	.727	.672	.617	.562	.453
	Loss Conversion Factor	.027	.055	.082	.109	.137	.164	.191	.219	.246	.273	.328	.383	.438	.547
42	Basic Premium Ratio	.970	.941	.911	.881	.852	.822	.792	.763	.733	.703	.644	.585	.525	.406
	Loss Conversion Factor	.030	.059	.089	.119	.148	.178	.208	.237	.267	.297	.356	.415	.475	.594
41	Basic Premium Ratio	.968	.935	.903	.870	.838	.806	.773	.741	.708	.676	.611	.546	.481	.352
	Loss Conversion Factor	.032	.065	.097	.130	.162	.194	.227	.259	.292	.324	.389	.454	.519	.648
40	Basic Premium Ratio	.965	.929	.894	.859	.823	.788	.753	.718	.682	.647	.576	.506	.435	.294
	Loss Conversion Factor	.035	.071	.106	.141	.177	.212	.247	.282	.318	.353	.424	.494	.565	.706
39	Basic Premium Ratio	.962	.923	.885	.847	.808	.770	.732	.693	.655	.616	.540	.463	.386	.233
	Loss Conversion Factor	.038	.077	.115	.153	.192	.230	.268	.307	.345	.384	.460	.537	.614	.767
38	Basic Premium Ratio	.958	.917	.875	.834	.792	.751	.709	.668	.626	.585	.502	.419	.336	.170
	Loss Conversion Factor	.042	.083	.125	.166	.208	.249	.291	.332	.374	.415	.498	.581	.664	.830
37	Basic Premium Ratio	.955	.910	.865	.820	.776	.731	.686	.641	.596	.551	.461	.371	.282	.102
	Loss Conversion Factor	.045	.090	.135	.180	.224	.269	.314	.359	.404	.449	.539	.629	.718	.898
36	Basic Premium Ratio	.951	.903	.854	.806	.757	.709	.660	.612	.563	.514	.417	.320	.223	.029
	Loss Conversion Factor	.049	.097	.146	.194	.243	.291	.340	.388	.437	.486	.583	.680	.777	.971
35	Basic Premium Ratio	.947	.895	.842	.789	.736	.684	.631	.578	.525	.473	.367	.262	.156	.000
	Loss Conversion Factor	.053	.105	.158	.211	.264	.316	.369	.422	.475	.527	.633	.738	.844	.987
34	Basic Premium Ratio	.943	.886	.829	.771	.714	.657	.600	.543	.486	.428	.314	.200	.085	.000
	Loss Conversion Factor	.057	.114	.171	.229	.286	.343	.400	.457	.514	.572	.686	.800	.915	.969
33	Basic Premium Ratio	.938	.876	.814	.752	.690	.628	.567	.505	.443	.381	.257	.133	.009	.000
	Loss Conversion Factor	.062	.124	.186	.248	.310	.372	.433	.495	.557	.619	.743	.867	.991	.953
32	Basic Premium Ratio	.933	.866	.799	.732	.665	.598	.531	.463	.396	.329	.195	.061	.000	.000
	Loss Conversion Factor	.067	.134	.201	.268	.335	.402	.469	.537	.604	.671	.805	.939	.984	.939
31	Basic Premium Ratio	.927	.854	.781	.707	.634	.561	.488	.415	.342	.268	.122	.000	.000	.000
	Loss Conversion Factor	.073	.146	.219	.293	.366	.439	.512	.585	.658	.732	.878	.994	.965	.925
30	Basic Premium Ratio	.920	.840	.760	.680	.600	.520	.440	.360	.280	.200	.040	.000	.000	.000
	Loss Conversion Factor	.080	.160	.240	.320	.400	.480	.560	.640	.720	.800	.960	.975	.949	.913
29	Basic Premium Ratio	.913	.826	.739	.651	.564	.477	.390	.303	.216	.128	.000	.000	.000	.000
	Loss Conversion Factor	.087	.174	.261	.349	.436	.523	.610	.697	.784	.872	.990	.958	.935	.902
28	Basic Premium Ratio	.904	.807	.711	.615	.519	.422	.326	.230	.134	.037	.000	.000	.000	.000
	Loss Conversion Factor	.096	.193	.289	.385	.481	.578	.674	.770	.866	.963	.969	.940	.918	.887
27	Basic Premium Ratio	.892	.785	.677	.570	.462	.355	.247	.140	.032	.000	.000	.000	.000	.000
	Loss Conversion Factor	.108	.215	.323	.430	.538	.645	.753	.860	.968	.983	.946	.918	.897	.868
26	Basic Premium Ratio	.881	.761	.642	.522	.403	.283	.164	.044	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.119	.239	.358	.478	.597	.717	.836	.956	.983	.960	.925	.899	.879	.851
25	Basic Premium Ratio	.868	.736	.604	.472	.340	.208	.075	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.132	.264	.396	.528	.660	.792	.925	.987	.961	.940	.907	.883	.864	.838
24	Basic Premium Ratio	.852	.705	.557	.409	.261	.114	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.148	.295	.443	.591	.739	.886	.992	.964	.941	.922	.893	.872	.855	.832
23	Basic Premium Ratio	.835	.669	.504	.338	.173	.008	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.165	.331	.496	.662	.827	.992	.969	.944	.924	.907	.881	.862	.848	.827
22	Basic Premium Ratio	.814	.628	.442	.256	.070	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.186	.372	.558	.744	.930	.978	.949	.927	.909	.894	.871	.854	.841	.823
21	Basic Premium Ratio	.790	.579	.369	.159	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.210	.421	.631	.841	.990	.957	.932	.912	.896	.882	.862	.847	.835	.818
20	Basic Premium Ratio	.758	.516	.274	.032	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.242	.484	.726	.968	.966	.936	.913	.895	.881	.869	.851	.837	.827	.812

Workers' Compensation Insurance

296-17-91903

Maximum Premium Ratio:		1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
19	Basic Premium Ratio	.720	.439	.159	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.280	.561	.841	.979	.942	.915	.894	.878	.865	.854	.838	.826	.817	.805
18	Basic Premium Ratio	.672	.344	.016	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.328	.656	.984	.954	.920	.896	.877	.863	.851	.842	.827	.817	.810	.799
17	Basic Premium Ratio	.617	.234	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.383	.766	.977	.932	.902	.879	.863	.850	.839	.831	.819	.810	.803	.794
16	Basic Premium Ratio	.550	.100	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.450	.900	.953	.913	.885	.865	.851	.839	.830	.823	.812	.804	.798	.790
15	Basic Premium Ratio	.477	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.523	.992	.932	.896	.872	.854	.841	.831	.822	.816	.806	.799	.794	.788
14	Basic Premium Ratio	.414	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.586	.973	.912	.881	.861	.846	.834	.825	.818	.812	.804	.797	.793	.787
13	Basic Premium Ratio	.344	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.656	.953	.889	.867	.851	.838	.828	.821	.814	.809	.801	.796	.791	.786
12	Basic Premium Ratio	.256	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.744	.931	.874	.856	.842	.831	.823	.816	.810	.806	.799	.794	.790	.785
11	Basic Premium Ratio	.159	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.841	.906	.860	.846	.834	.825	.818	.812	.807	.803	.796	.792	.788	.784
10	Basic Premium Ratio	.032	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.968	.879	.848	.836	.827	.819	.813	.807	.803	.800	.794	.790	.787	.783
9	Basic Premium Ratio	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.982	.850	.838	.828	.820	.813	.808	.803	.800	.797	.792	.788	.786	.782
8	Basic Premium Ratio	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.952	.838	.828	.820	.813	.808	.803	.800	.796	.794	.790	.787	.784	.781
7	Basic Premium Ratio	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.917	.828	.820	.813	.807	.803	.799	.796	.793	.791	.788	.785	.783	.780
6	Basic Premium Ratio	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.876	.818	.812	.806	.802	.798	.795	.792	.790	.788	.785	.783	.782	.779
5	Basic Premium Ratio	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
	Loss Conversion Factor	.826	.809	.804	.800	.797	.794	.791	.789	.787	.786	.783	.782	.780	.778

[Statutory Authority: RCW 51.04.020(1) and 51.16.035. 88-24-010 (Order 88-26), § 296-17-91902, filed 12/1/88, effective 1/1/89; 88-14-107 (Order 88-10), § 296-17-91902, filed 7/6/88; 86-17-002 (Order 86-29), § 296-17-91902, filed 8/8/86. Statutory Authority: RCW 51.16.035. 86-06-018 (Order 86-18), § 296-17-91902, filed 2/25/86; 85-06-025 (Order 85-8), § 296-17-91902, filed 2/28/85, effective 7/1/85; 84-06-024 (Order 84-2), § 296-17-91902, filed 2/29/84, effective 7/1/84; 83-05-018 (Order 83-4), § 296-17-91902, filed 2/9/83, effective 7/1/83; 82-05-019 (Order 82-5), § 296-17-91902, filed 2/10/82; 81-04-024 (Order 81-02), § 296-17-91902, filed 1/30/81.]

WAC 296-17-91903 Table IV.

RETROSPECTIVE RATING PLAN A1
 MINIMUM PREMIUM RATIOS
 BASIC PREMIUM RATIO = .058
 LOSS CONVERSION FACTOR = .729
 Effective January 1, 1989

Maximum Premium Ratio:	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
84	.995	.990	.986	.981	.977	.972	.968	.963	.959	.955	.947	.939	.931	.917
	.995	.990	.985	.980	.975	.970	.966	.961	.957	.952	.944	.935	.927	.912
82	.995	.989	.984	.979	.974	.969	.964	.959	.954	.950	.940	.932	.923	.907
	.994	.989	.983	.978	.972	.967	.962	.957	.952	.947	.937	.928	.919	.903
80	.994	.988	.982	.977	.971	.965	.960	.955	.949	.944	.934	.924	.915	.898
	.994	.987	.981	.975	.969	.963	.958	.952	.946	.941	.930	.920	.910	.892
78	.993	.987	.980	.974	.967	.961	.955	.949	.943	.938	.927	.916	.905	.886

Maximum Premium Ratio:	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
Size Group														
77	.993	.986	.979	.972	.966	.959	.953	.946	.940	.934	.922	.911	.900	.880
76	.992	.985	.978	.971	.964	.957	.951	.944	.938	.931	.919	.907	.896	.875
75	.992	.985	.977	.970	.962	.955	.949	.942	.935	.929	.916	.904	.892	.870
74	.992	.984	.976	.968	.960	.953	.946	.939	.932	.925	.911	.898	.886	.863
73	.991	.983	.974	.966	.958	.951	.943	.935	.928	.921	.907	.893	.881	.856
72	.991	.982	.973	.965	.956	.948	.940	.932	.925	.917	.902	.888	.875	.850
71	.990	.981	.972	.963	.954	.946	.937	.929	.921	.913	.898	.883	.869	.843
70	.990	.980	.971	.961	.952	.943	.934	.926	.917	.909	.893	.878	.863	.836
69	.990	.979	.969	.960	.950	.941	.932	.923	.914	.906	.889	.874	.859	.831
68	.989	.979	.969	.959	.949	.939	.930	.921	.912	.904	.887	.871	.856	.827
67	.989	.978	.968	.958	.948	.938	.928	.919	.910	.901	.884	.868	.852	.824
66	.989	.977	.967	.956	.946	.936	.926	.916	.907	.898	.880	.864	.848	.818
65	.988	.976	.965	.954	.944	.933	.923	.913	.903	.894	.876	.859	.842	.812
64	.988	.976	.964	.953	.942	.931	.920	.910	.900	.890	.872	.854	.837	.806
63	.987	.975	.963	.951	.940	.928	.918	.907	.897	.887	.868	.850	.833	.801
62	.987	.974	.961	.949	.938	.926	.915	.904	.894	.884	.864	.845	.828	.795
61	.986	.973	.960	.948	.936	.924	.912	.901	.890	.880	.860	.841	.823	.789
60	.986	.972	.959	.946	.933	.921	.909	.898	.887	.876	.855	.836	.817	.783
59	.985	.971	.958	.944	.931	.919	.907	.895	.883	.872	.851	.831	.812	.777
58	.985	.970	.956	.943	.929	.917	.904	.892	.880	.869	.847	.826	.807	.771
57	.985	.970	.955	.941	.927	.914	.901	.889	.877	.865	.843	.822	.802	.765
56	.984	.969	.954	.939	.925	.912	.899	.886	.874	.862	.839	.818	.797	.760
55	.984	.968	.953	.938	.924	.910	.896	.884	.871	.859	.836	.814	.793	.756
54	.983	.967	.951	.936	.922	.908	.894	.881	.868	.856	.832	.810	.790	.752
53	.983	.966	.950	.935	.920	.906	.892	.878	.866	.853	.829	.807	.786	.748
52	.982	.965	.949	.933	.918	.904	.890	.876	.863	.850	.826	.804	.783	.744
51	.982	.965	.948	.932	.917	.902	.887	.874	.860	.847	.823	.800	.779	.740
50	.982	.964	.947	.930	.915	.899	.885	.871	.857	.844	.819	.796	.775	.735
49	.981	.963	.946	.929	.913	.897	.882	.868	.854	.841	.816	.792	.770	.731
48	.981	.962	.945	.927	.911	.895	.880	.866	.852	.838	.812	.789	.767	.727
47	.980	.962	.944	.926	.910	.894	.878	.864	.849	.836	.810	.786	.764	.723
46	.980	.961	.943	.925	.909	.893	.877	.863	.848	.835	.809	.785	.763	.723
45	.980	.961	.942	.925	.908	.892	.877	.862	.848	.834	.808	.784	.762	.722
44	.980	.960	.942	.924	.907	.891	.876	.861	.847	.833	.808	.784	.762	.722
43	.980	.960	.941	.924	.907	.891	.875	.861	.846	.833	.807	.784	.762	.722
42	.979	.959	.940	.922	.905	.888	.872	.857	.843	.829	.803	.779	.757	.717
41	.978	.958	.938	.920	.902	.885	.869	.853	.839	.825	.798	.774	.751	.710
40	.978	.957	.937	.918	.899	.882	.866	.850	.835	.820	.793	.768	.745	.704
39	.977	.956	.935	.916	.897	.879	.863	.846	.831	.816	.789	.764	.741	.699
38	.977	.955	.934	.914	.895	.877	.860	.843	.828	.813	.785	.760	.736	.694
37	.976	.954	.933	.912	.893	.875	.857	.841	.825	.810	.782	.756	.732	.690
36	.976	.953	.932	.911	.891	.873	.855	.838	.822	.807	.779	.753	.729	.686
35	.976	.953	.931	.910	.890	.871	.854	.837	.821	.805	.777	.751	.727	.684
34	.975	.952	.930	.909	.889	.870	.852	.835	.819	.804	.775	.749	.725	.683
33	.975	.951	.929	.908	.888	.869	.851	.834	.818	.802	.774	.748	.724	.682
32	.975	.951	.929	.907	.887	.868	.850	.833	.817	.802	.773	.747	.724	.682
31	.975	.951	.928	.907	.886	.867	.849	.832	.816	.801	.773	.747	.724	.682
30	.974	.950	.927	.906	.886	.867	.849	.832	.816	.801	.773	.747	.724	.682
29	.974	.950	.927	.906	.886	.867	.849	.832	.816	.801	.773	.747	.724	.682
28	.974	.949	.926	.904	.883	.864	.846	.828	.812	.797	.769	.744	.721	.682
27	.973	.947	.922	.899	.877	.857	.837	.819	.802	.785	.754	.727	.701	.657
26	.972	.945	.919	.895	.872	.851	.830	.811	.792	.775	.742	.712	.685	.636
25	.971	.943	.917	.892	.868	.846	.824	.804	.785	.766	.732	.701	.672	.620
24	.971	.943	.917	.892	.868	.846	.824	.804	.785	.766	.732	.701	.672	.620
23	.971	.943	.917	.892	.868	.846	.824	.804	.785	.766	.732	.701	.672	.620
22	.971	.943	.917	.892	.868	.846	.824	.804	.785	.766	.732	.701	.672	.620
21	.971	.943	.917	.892	.868	.846	.824	.804	.785	.766	.732	.701	.672	.620
20	.971	.943	.917	.892	.868	.846	.824	.804	.785	.766	.732	.701	.672	.620
19	.970	.941	.915	.891	.868	.846	.824	.804	.785	.766	.732	.701	.672	.620
18	.969	.940	.912	.887	.864	.843	.823	.804	.785	.766	.732	.701	.672	.620
17	.968	.938	.911	.885	.862	.840	.820	.801	.784	.766	.732	.701	.672	.620
16	.968	.937	.910	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
15	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
14	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
13	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
12	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
11	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
10	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620

Workers' Compensation Insurance

296-17-91904

Maximum Premium Ratio:	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
Size Group														
9	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
8	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
7	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
6	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620
5	.967	.937	.909	.884	.860	.838	.818	.800	.783	.766	.732	.701	.672	.620

[Statutory Authority: RCW 51.04.020(1) and 51.16.035. 88-24-010 (Order 88-26), § 296-17-91903, filed 12/1/88, effective 1/1/89; 88-14-107 (Order 88-10), § 296-17-91903, filed 7/6/88; 86-17-002 (Order 86-29), § 296-17-91903, filed 8/8/86. Statutory Authority: RCW 51.16.035. 86-06-018 (Order 86-18), § 296-17-91903, filed 2/25/86.]

WAC 296-17-91904 Table V.

RETROSPECTIVE RATING PLAN A2
 MINIMUM PREMIUM RATIOS
 AND BASIC PREMIUM RATIOS
 LOSS CONVERSION FACTOR = .729
 Effective January 1, 1989

Maximum Premium Ratio:	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00	
Size Group															
84	Basic Premium Ratio	.517	.508	.500	.494	.488	.483	.479	.475	.472	.469	.463	.458	.453	.443
	Minimum Premium Ratio	.993	.986	.980	.974	.968	.963	.958	.953	.948	.943	.934	.924	.916	.899
83	Basic Premium Ratio	.516	.506	.498	.491	.485	.480	.476	.472	.468	.465	.458	.453	.447	.438
	Minimum Premium Ratio	.992	.985	.979	.972	.966	.961	.955	.950	.945	.939	.930	.920	.911	.893
82	Basic Premium Ratio	.515	.504	.495	.488	.482	.477	.472	.468	.464	.460	.454	.448	.442	.432
	Minimum Premium Ratio	.992	.984	.977	.971	.965	.959	.953	.947	.941	.936	.925	.915	.905	.887
81	Basic Premium Ratio	.513	.502	.493	.485	.479	.473	.468	.464	.460	.456	.449	.443	.437	.427
	Minimum Premium Ratio	.991	.983	.976	.969	.963	.956	.950	.944	.938	.933	.922	.911	.900	.881
80	Basic Premium Ratio	.512	.500	.490	.482	.476	.470	.465	.460	.456	.452	.445	.438	.432	.421
	Minimum Premium Ratio	.991	.983	.975	.968	.961	.954	.948	.941	.935	.929	.917	.906	.895	.875
79	Basic Premium Ratio	.511	.498	.487	.479	.472	.466	.461	.456	.452	.448	.440	.433	.427	.415
	Minimum Premium Ratio	.990	.981	.973	.966	.958	.951	.944	.938	.931	.925	.913	.901	.889	.868
78	Basic Premium Ratio	.509	.496	.485	.476	.469	.463	.457	.452	.447	.443	.435	.428	.421	.409
	Minimum Premium Ratio	.990	.980	.972	.964	.956	.948	.941	.934	.927	.920	.907	.895	.883	.860
77	Basic Premium Ratio	.508	.494	.483	.474	.466	.459	.454	.448	.443	.439	.430	.423	.416	.402
	Minimum Premium Ratio	.989	.979	.970	.961	.953	.945	.937	.930	.923	.915	.902	.888	.876	.852
76	Basic Premium Ratio	.507	.492	.480	.471	.463	.456	.450	.444	.439	.434	.425	.417	.410	.396
	Minimum Premium Ratio	.988	.978	.968	.959	.950	.942	.934	.926	.919	.911	.897	.883	.870	.845
75	Basic Premium Ratio	.506	.490	.477	.467	.459	.452	.445	.440	.434	.429	.420	.412	.404	.390
	Minimum Premium Ratio	.988	.977	.967	.957	.948	.939	.931	.923	.915	.907	.892	.878	.864	.838
74	Basic Premium Ratio	.504	.487	.475	.464	.456	.448	.442	.435	.430	.425	.415	.406	.398	.384
	Minimum Premium Ratio	.987	.976	.965	.955	.945	.936	.927	.918	.910	.902	.886	.871	.857	.830
73	Basic Premium Ratio	.503	.485	.472	.461	.452	.444	.437	.431	.425	.420	.410	.401	.393	.377
	Minimum Premium Ratio	.986	.974	.963	.952	.942	.933	.923	.914	.905	.897	.880	.865	.849	.821
72	Basic Premium Ratio	.501	.483	.469	.458	.449	.441	.433	.427	.421	.415	.405	.395	.387	.370
	Minimum Premium Ratio	.986	.973	.961	.950	.939	.929	.919	.910	.901	.892	.874	.858	.842	.813
71	Basic Premium Ratio	.499	.480	.466	.455	.445	.437	.429	.422	.416	.410	.399	.390	.380	.364
	Minimum Premium Ratio	.985	.972	.959	.948	.936	.926	.916	.906	.896	.886	.868	.851	.835	.804
70	Basic Premium Ratio	.498	.478	.463	.451	.441	.433	.425	.418	.411	.405	.394	.384	.374	.357
	Minimum Premium Ratio	.984	.970	.957	.945	.934	.922	.912	.901	.891	.881	.862	.844	.827	.796
69	Basic Premium Ratio	.496	.475	.460	.448	.438	.429	.421	.413	.406	.400	.389	.378	.368	.351
	Minimum Premium Ratio	.984	.969	.956	.943	.931	.919	.908	.897	.887	.876	.857	.838	.821	.788

Maximum Premium Ratio:		1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
Size Group															
68	Basic Premium Ratio	.494	.472	.457	.444	.433	.424	.416	.408	.401	.395	.383	.372	.362	.344
	Minimum Premium Ratio	.983	.968	.954	.940	.928	.916	.904	.893	.883	.872	.852	.833	.815	.782
67	Basic Premium Ratio	.492	.469	.453	.440	.429	.420	.411	.403	.396	.390	.377	.366	.356	.338
	Minimum Premium Ratio	.982	.966	.952	.938	.925	.913	.901	.890	.879	.868	.848	.828	.810	.776
66	Basic Premium Ratio	.489	.467	.450	.436	.425	.415	.406	.398	.391	.384	.372	.360	.350	.331
	Minimum Premium Ratio	.981	.965	.950	.936	.922	.909	.897	.885	.874	.863	.841	.822	.803	.769
65	Basic Premium Ratio	.487	.464	.446	.433	.421	.411	.402	.393	.386	.379	.366	.354	.343	.324
	Minimum Premium Ratio	.981	.963	.948	.933	.919	.905	.893	.880	.868	.857	.835	.815	.796	.761
64	Basic Premium Ratio	.485	.461	.443	.429	.417	.406	.397	.388	.380	.373	.360	.348	.337	.317
	Minimum Premium Ratio	.980	.962	.945	.930	.916	.902	.888	.876	.864	.852	.829	.808	.788	.753
63	Basic Premium Ratio	.483	.457	.439	.425	.412	.402	.392	.383	.375	.368	.354	.342	.330	.311
	Minimum Premium Ratio	.979	.960	.943	.927	.912	.898	.884	.871	.859	.846	.823	.802	.782	.745
62	Basic Premium Ratio	.480	.454	.436	.421	.408	.397	.387	.378	.370	.362	.348	.335	.324	.304
	Minimum Premium Ratio	.978	.959	.941	.925	.909	.894	.880	.867	.854	.841	.818	.796	.775	.738
61	Basic Premium Ratio	.478	.451	.432	.416	.403	.392	.382	.373	.364	.356	.342	.329	.318	.297
	Minimum Premium Ratio	.977	.957	.939	.922	.906	.891	.876	.862	.849	.836	.811	.789	.768	.730
60	Basic Premium Ratio	.475	.448	.428	.412	.399	.387	.377	.367	.358	.350	.336	.323	.311	.290
	Minimum Premium Ratio	.976	.955	.936	.919	.902	.886	.871	.857	.843	.830	.805	.781	.760	.721
59	Basic Premium Ratio	.473	.445	.424	.408	.394	.382	.371	.362	.353	.344	.329	.316	.304	.283
	Minimum Premium Ratio	.975	.954	.934	.916	.898	.882	.867	.852	.837	.824	.798	.774	.752	.713
58	Basic Premium Ratio	.471	.442	.421	.404	.389	.377	.366	.356	.347	.338	.323	.310	.298	.277
	Minimum Premium Ratio	.974	.952	.931	.912	.895	.878	.862	.847	.832	.818	.792	.767	.745	.704
57	Basic Premium Ratio	.468	.438	.417	.399	.385	.372	.361	.351	.341	.333	.317	.303	.291	.270
	Minimum Premium Ratio	.973	.950	.929	.909	.891	.874	.857	.842	.827	.813	.786	.761	.738	.697
56	Basic Premium Ratio	.465	.434	.412	.395	.380	.367	.355	.345	.335	.326	.311	.297	.285	.263
	Minimum Premium Ratio	.972	.948	.926	.906	.887	.870	.853	.837	.822	.807	.780	.755	.731	.690
55	Basic Premium Ratio	.462	.430	.408	.390	.374	.361	.349	.339	.329	.320	.304	.290	.278	.257
	Minimum Premium Ratio	.971	.946	.924	.903	.884	.866	.849	.832	.817	.802	.774	.749	.725	.683
54	Basic Premium Ratio	.458	.426	.403	.384	.369	.355	.343	.333	.323	.314	.298	.284	.271	.250
	Minimum Premium Ratio	.970	.945	.922	.900	.880	.862	.844	.827	.812	.797	.768	.743	.719	.677
53	Basic Premium Ratio	.455	.422	.398	.379	.363	.350	.337	.327	.317	.307	.291	.277	.265	.244
	Minimum Premium Ratio	.969	.943	.919	.897	.877	.858	.840	.823	.807	.792	.763	.737	.713	.671
52	Basic Premium Ratio	.451	.417	.393	.374	.358	.344	.332	.320	.310	.301	.285	.271	.258	.238
	Minimum Premium Ratio	.968	.941	.917	.895	.874	.854	.836	.819	.803	.787	.758	.732	.709	.666
51	Basic Premium Ratio	.447	.413	.388	.369	.352	.338	.325	.314	.304	.295	.278	.264	.252	.232
	Minimum Premium Ratio	.967	.939	.914	.891	.870	.851	.832	.815	.798	.782	.753	.727	.703	.660
50	Basic Premium Ratio	.443	.408	.383	.363	.346	.332	.319	.308	.298	.288	.272	.258	.245	.225
	Minimum Premium Ratio	.966	.937	.912	.888	.867	.846	.828	.810	.793	.777	.747	.721	.697	.654
49	Basic Premium Ratio	.440	.403	.378	.357	.340	.326	.313	.301	.291	.282	.265	.251	.239	.219
	Minimum Premium Ratio	.965	.935	.909	.885	.863	.842	.823	.805	.788	.772	.742	.715	.690	.647
48	Basic Premium Ratio	.436	.399	.372	.352	.334	.320	.307	.295	.285	.275	.259	.245	.232	.213
	Minimum Premium Ratio	.964	.933	.907	.882	.860	.839	.819	.801	.783	.767	.737	.710	.685	.641
47	Basic Premium Ratio	.431	.394	.367	.346	.328	.313	.300	.289	.278	.269	.252	.238	.226	.207
	Minimum Premium Ratio	.962	.931	.904	.879	.856	.835	.816	.797	.780	.763	.733	.706	.681	.637
46	Basic Premium Ratio	.427	.388	.361	.339	.321	.306	.293	.282	.271	.262	.246	.232	.220	.201
	Minimum Premium Ratio	.961	.929	.901	.876	.853	.832	.812	.793	.776	.760	.729	.702	.678	.635
45	Basic Premium Ratio	.423	.383	.354	.333	.315	.300	.286	.275	.265	.255	.239	.226	.215	.196
	Minimum Premium Ratio	.960	.927	.899	.873	.850	.829	.809	.790	.773	.757	.727	.700	.675	.633
44	Basic Premium Ratio	.418	.377	.348	.326	.308	.293	.280	.268	.258	.249	.233	.220	.209	.191
	Minimum Premium Ratio	.958	.925	.897	.871	.848	.826	.806	.788	.771	.754	.725	.698	.674	.631
43	Basic Premium Ratio	.413	.371	.342	.319	.301	.286	.273	.262	.252	.243	.227	.215	.204	.186
	Minimum Premium Ratio	.957	.924	.895	.869	.846	.824	.804	.786	.768	.752	.723	.696	.672	.630
42	Basic Premium Ratio	.408	.365	.335	.313	.294	.279	.266	.255	.245	.236	.221	.208	.197	.180
	Minimum Premium Ratio	.956	.921	.892	.865	.842	.820	.799	.781	.763	.747	.716	.690	.666	.623

Workers' Compensation Insurance

296-17-91904

Maximum Premium Ratio:		1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
41	Basic Premium Ratio	.403	.359	.329	.306	.288	.272	.259	.248	.238	.229	.213	.201	.190	.173
	Minimum Premium Ratio	.954	.919	.889	.862	.837	.815	.794	.775	.757	.740	.710	.683	.659	.616
40	Basic Premium Ratio	.398	.353	.322	.299	.281	.265	.252	.241	.231	.222	.207	.194	.184	.167
	Minimum Premium Ratio	.953	.917	.886	.858	.833	.810	.789	.770	.752	.735	.704	.677	.651	.609
39	Basic Premium Ratio	.392	.347	.316	.292	.274	.258	.245	.234	.224	.215	.200	.188	.177	.161
	Minimum Premium Ratio	.951	.914	.883	.855	.829	.806	.785	.765	.747	.730	.699	.671	.646	.603
38	Basic Premium Ratio	.386	.340	.309	.286	.267	.252	.238	.227	.217	.209	.194	.182	.171	.155
	Minimum Premium Ratio	.950	.913	.880	.852	.826	.802	.781	.761	.743	.725	.694	.666	.641	.598
37	Basic Premium Ratio	.380	.333	.302	.279	.260	.245	.232	.221	.211	.202	.188	.176	.166	.150
	Minimum Premium Ratio	.949	.911	.878	.849	.823	.800	.778	.757	.739	.722	.690	.661	.636	.593
36	Basic Premium Ratio	.373	.326	.295	.272	.253	.238	.225	.214	.204	.196	.181	.170	.160	.145
	Minimum Premium Ratio	.948	.909	.876	.847	.821	.797	.775	.755	.736	.718	.687	.658	.634	.590
35	Basic Premium Ratio	.366	.318	.287	.264	.246	.230	.218	.207	.197	.189	.175	.164	.154	.140
	Minimum Premium Ratio	.947	.908	.874	.845	.818	.795	.773	.752	.734	.716	.685	.656	.632	.588
34	Basic Premium Ratio	.358	.310	.279	.256	.238	.223	.211	.200	.191	.183	.169	.158	.149	.135
	Minimum Premium Ratio	.946	.906	.873	.844	.817	.793	.771	.751	.732	.714	.683	.655	.630	.587
33	Basic Premium Ratio	.349	.302	.271	.249	.231	.216	.204	.194	.184	.177	.163	.153	.144	.130
	Minimum Premium Ratio	.945	.906	.872	.842	.816	.792	.770	.750	.732	.714	.683	.655	.630	.588
32	Basic Premium Ratio	.341	.294	.263	.241	.224	.209	.197	.187	.178	.171	.158	.148	.139	.126
	Minimum Premium Ratio	.945	.905	.872	.842	.816	.792	.770	.750	.732	.714	.683	.655	.631	.589
31	Basic Premium Ratio	.333	.285	.255	.233	.216	.202	.190	.180	.172	.164	.152	.142	.134	.122
	Minimum Premium Ratio	.944	.904	.870	.841	.814	.790	.769	.749	.730	.714	.683	.656	.633	.591
30	Basic Premium Ratio	.324	.277	.247	.225	.208	.195	.183	.174	.166	.159	.147	.137	.130	.118
	Minimum Premium Ratio	.943	.902	.869	.840	.814	.790	.769	.748	.730	.713	.683	.658	.634	.595
29	Basic Premium Ratio	.315	.268	.239	.218	.201	.188	.177	.168	.160	.153	.142	.133	.126	.115
	Minimum Premium Ratio	.942	.902	.868	.839	.813	.790	.769	.749	.731	.715	.685	.659	.637	.599
28	Basic Premium Ratio	.306	.260	.231	.210	.194	.181	.170	.161	.153	.147	.136	.127	.120	.109
	Minimum Premium Ratio	.942	.901	.867	.838	.811	.788	.766	.747	.729	.711	.681	.655	.632	.593
27	Basic Premium Ratio	.298	.252	.223	.202	.186	.173	.163	.153	.146	.139	.128	.119	.112	.101
	Minimum Premium Ratio	.940	.898	.864	.833	.806	.781	.758	.738	.718	.700	.668	.640	.614	.571
26	Basic Premium Ratio	.290	.244	.216	.195	.179	.166	.155	.146	.138	.132	.121	.112	.105	.094
	Minimum Premium Ratio	.939	.896	.860	.829	.801	.775	.752	.731	.711	.691	.657	.627	.599	.553
25	Basic Premium Ratio	.281	.236	.208	.188	.172	.159	.148	.139	.132	.125	.114	.105	.098	.088
	Minimum Premium Ratio	.938	.895	.858	.826	.797	.771	.747	.725	.704	.685	.650	.619	.592	.542
24	Basic Premium Ratio	.270	.226	.199	.179	.164	.152	.142	.133	.126	.120	.110	.102	.095	.086
	Minimum Premium Ratio	.938	.894	.858	.827	.798	.773	.749	.729	.708	.689	.655	.625	.600	.551
23	Basic Premium Ratio	.259	.216	.190	.171	.156	.145	.136	.128	.121	.115	.106	.098	.093	.084
	Minimum Premium Ratio	.938	.895	.860	.829	.802	.777	.753	.733	.714	.697	.663	.636	.608	.564
22	Basic Premium Ratio	.248	.207	.181	.163	.150	.139	.130	.123	.116	.111	.102	.095	.090	.082
	Minimum Premium Ratio	.938	.896	.862	.832	.805	.781	.760	.739	.722	.704	.674	.648	.622	.580
21	Basic Premium Ratio	.236	.197	.173	.156	.143	.133	.125	.118	.112	.107	.099	.093	.088	.080
	Minimum Premium Ratio	.940	.899	.865	.836	.811	.787	.766	.747	.730	.714	.685	.659	.636	.599
20	Basic Premium Ratio	.226	.188	.165	.149	.136	.126	.119	.112	.107	.102	.094	.089	.084	.077
	Minimum Premium Ratio	.939	.898	.865	.835	.810	.788	.766	.748	.730	.715	.689	.662	.642	.607
19	Basic Premium Ratio	.218	.180	.156	.140	.128	.119	.111	.105	.100	.096	.089	.084	.080	.074
	Minimum Premium Ratio	.937	.894	.860	.830	.804	.781	.761	.742	.724	.708	.680	.655	.633	.597
18	Basic Premium Ratio	.208	.171	.148	.133	.121	.112	.105	.099	.095	.091	.084	.080	.076	.071
	Minimum Premium Ratio	.935	.892	.857	.826	.800	.777	.756	.737	.718	.703	.677	.651	.631	.594
17	Basic Premium Ratio	.199	.162	.140	.125	.115	.106	.099	.094	.090	.086	.081	.076	.073	.069
	Minimum Premium Ratio	.934	.891	.856	.826	.798	.775	.755	.736	.717	.703	.673	.653	.631	.592
16	Basic Premium Ratio	.189	.154	.133	.119	.109	.101	.095	.090	.086	.082	.077	.073	.071	.067
	Minimum Premium Ratio	.934	.890	.855	.825	.798	.775	.754	.736	.719	.706	.679	.658	.633	.598
15	Basic Premium Ratio	.181	.146	.126	.113	.103	.096	.090	.086	.082	.079	.075	.071	.069	.065
	Minimum Premium Ratio	.933	.889	.855	.826	.801	.778	.759	.739	.724	.710	.682	.663	.641	.613

Maximum Premium Ratio:		1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
Size Group															
14	Basic Premium Ratio	.176	.139	.119	.108	.100	.093	.088	.084	.081	.078	.074	.070	.068	.065
	Minimum Premium Ratio	.924	.878	.850	.821	.796	.775	.755	.737	.720	.706	.679	.663	.642	.608
13	Basic Premium Ratio	.170	.131	.113	.103	.096	.090	.085	.082	.079	.076	.072	.070	.067	.064
	Minimum Premium Ratio	.915	.868	.844	.818	.793	.772	.754	.735	.719	.706	.682	.656	.643	.612
12	Basic Premium Ratio	.164	.123	.107	.099	.092	.087	.083	.080	.077	.075	.071	.069	.067	.064
	Minimum Premium Ratio	.904	.860	.839	.812	.791	.770	.751	.732	.718	.702	.680	.655	.637	.606
11	Basic Premium Ratio	.156	.113	.102	.094	.089	.084	.081	.078	.075	.073	.070	.068	.066	.063
	Minimum Premium Ratio	.892	.859	.834	.811	.786	.768	.747	.730	.718	.704	.678	.655	.638	.612
10	Basic Premium Ratio	.148	.104	.097	.090	.086	.082	.078	.076	.074	.072	.069	.067	.065	.063
	Minimum Premium Ratio	.876	.858	.829	.807	.782	.762	.748	.728	.712	.699	.676	.654	.640	.605
9	Basic Premium Ratio	.139	.098	.092	.087	.082	.079	.076	.074	.072	.070	.068	.066	.065	.062
	Minimum Premium Ratio	.856	.853	.825	.800	.782	.761	.744	.727	.712	.702	.674	.654	.631	.612
8	Basic Premium Ratio	.106	.093	.087	.083	.079	.076	.074	.072	.070	.069	.067	.065	.064	.062
	Minimum Premium Ratio	.855	.846	.823	.798	.779	.761	.741	.725	.713	.697	.671	.654	.633	.604
7	Basic Premium Ratio	.097	.088	.083	.079	.076	.074	.072	.070	.069	.068	.066	.064	.063	.061
	Minimum Premium Ratio	.855	.840	.818	.797	.777	.756	.738	.725	.707	.691	.668	.655	.636	.613
6	Basic Premium Ratio	.089	.083	.079	.076	.074	.072	.070	.068	.067	.066	.065	.063	.062	.061
	Minimum Premium Ratio	.855	.836	.814	.792	.768	.749	.735	.725	.709	.696	.664	.656	.640	.602
5	Basic Premium Ratio	.082	.078	.075	.073	.071	.069	.068	.067	.066	.065	.063	.062	.062	.061
	Minimum Premium Ratio	.855	.833	.811	.787	.767	.752	.732	.714	.700	.689	.677	.658	.624	.586

[Statutory Authority: RCW 51.04.020(1) and 51.16.035. 88-24-010 (Order 88-26), § 296-17-91904, filed 12/1/88, effective 1/1/89; 88-14-107 (Order 88-10), § 296-17-91904, filed 7/6/88; 86-17-002 (Order 86-29), § 296-17-91904, filed 8/8/86. Statutory Authority: RCW 51.16.035. 86-06-018 (Order 86-18), § 296-17-91904, filed 2/25/86.]

WAC 296-17-91905 Table VI.

RETROSPECTIVE RATING PLAN A3
 MINIMUM PREMIUM RATIOS
 AND BASIC PREMIUM RATIOS
 LOSS CONVERSION FACTOR = .729
 Effective January 1, 1989

Maximum Premium Ratio:		1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
Size Group															
84	Basic Premium Ratio	.832	.812	.793	.783	.767	.765	.754	.747	.736	.733	.720	.705	.694	.667
	Minimum Premium Ratio	.986	.974	.964	.955	.948	.940	.934	.928	.923	.917	.907	.898	.889	.873
83	Basic Premium Ratio	.832	.811	.793	.782	.767	.761	.748	.744	.731	.726	.714	.702	.687	.660
	Minimum Premium Ratio	.984	.972	.961	.952	.944	.936	.930	.923	.918	.912	.901	.891	.882	.865
82	Basic Premium Ratio	.832	.810	.793	.781	.766	.757	.747	.740	.731	.724	.709	.693	.680	.653
	Minimum Premium Ratio	.983	.969	.958	.948	.940	.932	.925	.918	.912	.906	.895	.885	.875	.857
81	Basic Premium Ratio	.832	.810	.793	.777	.764	.753	.746	.732	.726	.717	.703	.689	.674	.646
	Minimum Premium Ratio	.981	.967	.955	.945	.936	.928	.920	.914	.907	.901	.889	.878	.868	.849
80	Basic Premium Ratio	.832	.810	.791	.771	.761	.752	.738	.727	.724	.713	.697	.684	.666	.638
	Minimum Premium Ratio	.980	.965	.952	.942	.932	.923	.916	.909	.901	.895	.883	.871	.861	.841
79	Basic Premium Ratio	.831	.810	.788	.770	.757	.745	.733	.725	.715	.706	.691	.675	.658	.629
	Minimum Premium Ratio	.979	.962	.949	.938	.928	.919	.911	.903	.896	.889	.876	.864	.853	.832
78	Basic Premium Ratio	.830	.805	.785	.768	.751	.741	.727	.716	.708	.698	.679	.664	.648	.618
	Minimum Premium Ratio	.977	.960	.946	.934	.924	.914	.906	.898	.890	.883	.870	.857	.845	.823
77	Basic Premium Ratio	.829	.803	.781	.760	.745	.732	.719	.710	.700	.688	.672	.654	.636	.607
	Minimum Premium Ratio	.976	.958	.943	.931	.920	.910	.901	.892	.884	.877	.862	.849	.837	.813
76	Basic Premium Ratio	.829	.802	.776	.757	.739	.727	.712	.701	.689	.679	.661	.644	.627	.595
	Minimum Premium Ratio	.974	.955	.940	.927	.916	.905	.896	.887	.879	.871	.856	.842	.829	.805

Workers' Compensation Insurance

296-17-91905

Maximum Premium Ratio:		1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
Size Group															
75	Basic Premium Ratio	.828	.796	.771	.753	.736	.722	.705	.693	.682	.671	.653	.634	.618	.586
	Minimum Premium Ratio	.973	.953	.937	.923	.911	.900	.891	.882	.873	.865	.849	.835	.821	.796
74	Basic Premium Ratio	.828	.796	.767	.750	.730	.713	.698	.687	.675	.665	.644	.627	.609	.575
	Minimum Premium Ratio	.971	.950	.934	.919	.907	.896	.886	.876	.867	.858	.842	.826	.812	.786
73	Basic Premium Ratio	.827	.791	.767	.746	.727	.708	.694	.681	.670	.658	.634	.618	.597	.565
	Minimum Premium Ratio	.969	.948	.930	.915	.902	.891	.880	.870	.860	.851	.835	.818	.804	.776
72	Basic Premium Ratio	.827	.790	.762	.738	.720	.703	.690	.674	.662	.649	.627	.608	.588	.554
	Minimum Premium Ratio	.967	.945	.927	.912	.898	.886	.874	.864	.854	.845	.827	.810	.795	.766
71	Basic Premium Ratio	.826	.789	.760	.736	.716	.696	.681	.667	.653	.641	.619	.598	.577	.543
	Minimum Premium Ratio	.965	.942	.923	.907	.893	.881	.869	.858	.848	.838	.819	.802	.786	.756
70	Basic Premium Ratio	.825	.787	.754	.731	.712	.693	.676	.660	.647	.634	.609	.588	.568	.532
	Minimum Premium Ratio	.964	.939	.920	.903	.888	.875	.863	.852	.841	.831	.812	.794	.777	.746
69	Basic Premium Ratio	.824	.784	.751	.725	.704	.686	.667	.653	.641	.626	.602	.578	.557	.521
	Minimum Premium Ratio	.962	.936	.916	.899	.884	.870	.858	.846	.834	.824	.804	.786	.769	.737
68	Basic Premium Ratio	.824	.779	.746	.718	.697	.677	.660	.644	.631	.615	.592	.567	.547	.510
	Minimum Premium Ratio	.959	.933	.912	.895	.879	.865	.852	.840	.828	.818	.797	.779	.761	.729
67	Basic Premium Ratio	.824	.778	.742	.713	.690	.669	.653	.636	.621	.607	.582	.559	.538	.500
	Minimum Premium Ratio	.957	.929	.908	.890	.874	.860	.846	.834	.822	.811	.790	.771	.753	.721
66	Basic Premium Ratio	.821	.774	.737	.709	.684	.663	.645	.629	.613	.598	.571	.548	.526	.490
	Minimum Premium Ratio	.955	.926	.904	.885	.869	.854	.840	.827	.815	.804	.783	.763	.745	.711
65	Basic Premium Ratio	.821	.769	.732	.702	.677	.657	.637	.619	.604	.588	.561	.538	.517	.479
	Minimum Premium Ratio	.952	.923	.900	.881	.864	.848	.834	.821	.808	.797	.775	.754	.735	.701
64	Basic Premium Ratio	.818	.764	.727	.697	.670	.648	.629	.612	.596	.580	.552	.528	.507	.469
	Minimum Premium Ratio	.950	.920	.896	.876	.859	.843	.828	.814	.801	.789	.767	.746	.726	.691
63	Basic Premium Ratio	.818	.762	.722	.692	.666	.642	.622	.603	.586	.571	.543	.517	.495	.458
	Minimum Premium Ratio	.947	.916	.892	.871	.853	.837	.822	.808	.795	.782	.759	.738	.718	.682
62	Basic Premium Ratio	.814	.760	.719	.687	.659	.636	.616	.596	.578	.562	.534	.509	.486	.448
	Minimum Premium Ratio	.945	.912	.887	.866	.848	.831	.815	.801	.788	.775	.751	.729	.709	.673
61	Basic Premium Ratio	.813	.754	.713	.680	.652	.628	.606	.587	.570	.553	.524	.497	.475	.437
	Minimum Premium Ratio	.942	.909	.883	.861	.842	.825	.809	.794	.780	.767	.743	.721	.700	.663
60	Basic Premium Ratio	.811	.749	.705	.672	.644	.618	.597	.577	.558	.543	.513	.486	.464	.425
	Minimum Premium Ratio	.939	.905	.879	.856	.836	.819	.802	.787	.773	.759	.734	.712	.690	.653
59	Basic Premium Ratio	.805	.744	.699	.664	.634	.608	.586	.567	.549	.532	.501	.475	.452	.413
	Minimum Premium Ratio	.937	.901	.874	.851	.831	.813	.796	.780	.765	.751	.726	.703	.681	.643
58	Basic Premium Ratio	.802	.737	.691	.655	.626	.599	.577	.557	.538	.521	.490	.464	.441	.403
	Minimum Premium Ratio	.934	.898	.870	.846	.825	.807	.789	.773	.758	.744	.718	.694	.672	.633
57	Basic Premium Ratio	.796	.731	.685	.647	.618	.591	.568	.547	.528	.511	.480	.454	.431	.392
	Minimum Premium Ratio	.932	.894	.865	.841	.819	.800	.782	.766	.751	.736	.710	.685	.663	.624
56	Basic Premium Ratio	.794	.725	.678	.640	.609	.581	.558	.537	.518	.501	.470	.443	.421	.382
	Minimum Premium Ratio	.928	.890	.860	.835	.813	.794	.776	.759	.743	.728	.701	.677	.654	.614
55	Basic Premium Ratio	.790	.721	.671	.632	.601	.573	.550	.527	.509	.490	.460	.433	.411	.371
	Minimum Premium Ratio	.925	.885	.855	.830	.807	.787	.768	.752	.735	.721	.693	.668	.645	.606
54	Basic Premium Ratio	.787	.714	.666	.626	.592	.565	.541	.518	.499	.481	.450	.423	.400	.363
	Minimum Premium Ratio	.921	.881	.849	.823	.801	.780	.761	.744	.728	.713	.685	.660	.637	.597
53	Basic Premium Ratio	.784	.709	.659	.617	.585	.555	.532	.509	.489	.472	.440	.414	.391	.353
	Minimum Premium Ratio	.917	.876	.844	.818	.794	.774	.754	.737	.721	.705	.677	.652	.629	.589
52	Basic Premium Ratio	.780	.704	.651	.610	.577	.548	.522	.501	.481	.463	.431	.405	.382	.345
	Minimum Premium Ratio	.913	.871	.839	.812	.788	.767	.748	.729	.713	.697	.669	.644	.621	.581
51	Basic Premium Ratio	.775	.698	.644	.602	.567	.539	.514	.491	.471	.454	.422	.396	.372	.336
	Minimum Premium Ratio	.909	.866	.833	.806	.782	.760	.740	.722	.705	.689	.661	.635	.613	.573
50	Basic Premium Ratio	.769	.690	.634	.593	.557	.529	.502	.480	.460	.442	.411	.384	.362	.325
	Minimum Premium Ratio	.905	.861	.828	.799	.775	.752	.733	.714	.697	.681	.652	.627	.604	.564
49	Basic Premium Ratio	.763	.682	.626	.583	.548	.519	.493	.470	.450	.432	.400	.374	.352	.316
	Minimum Premium Ratio	.901	.856	.822	.793	.768	.745	.725	.706	.689	.673	.644	.618	.595	.555

Maximum Premium Ratio:		1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
Size Group															
48	Basic Premium Ratio	.756	.674	.617	.574	.538	.509	.482	.460	.439	.422	.390	.365	.342	.307
	Minimum Premium Ratio	.897	.851	.816	.786	.761	.738	.718	.699	.682	.665	.636	.610	.587	.547
47	Basic Premium Ratio	.750	.665	.607	.564	.528	.498	.472	.449	.429	.411	.381	.355	.333	.298
	Minimum Premium Ratio	.892	.846	.810	.780	.754	.731	.710	.692	.674	.658	.628	.602	.579	.539
46	Basic Premium Ratio	.741	.654	.596	.552	.516	.485	.460	.437	.418	.400	.370	.345	.323	.289
	Minimum Premium Ratio	.888	.840	.803	.773	.747	.724	.703	.684	.666	.650	.621	.596	.573	.534
45	Basic Premium Ratio	.731	.643	.585	.540	.503	.473	.448	.426	.406	.389	.360	.335	.315	.282
	Minimum Premium Ratio	.884	.834	.796	.766	.740	.717	.696	.677	.660	.643	.614	.589	.567	.528
44	Basic Premium Ratio	.722	.633	.573	.528	.493	.463	.437	.415	.396	.379	.350	.326	.306	.274
	Minimum Premium Ratio	.879	.828	.790	.759	.732	.709	.689	.670	.653	.637	.608	.583	.561	.523
43	Basic Premium Ratio	.712	.622	.562	.517	.481	.451	.426	.405	.386	.370	.341	.318	.298	.267
	Minimum Premium Ratio	.874	.822	.783	.752	.726	.703	.682	.663	.646	.630	.602	.578	.556	.518
42	Basic Premium Ratio	.703	.612	.551	.506	.470	.440	.415	.394	.375	.358	.330	.307	.288	.257
	Minimum Premium Ratio	.869	.815	.776	.745	.718	.694	.673	.654	.637	.621	.593	.568	.547	.509
41	Basic Premium Ratio	.696	.602	.541	.495	.458	.429	.403	.382	.363	.347	.319	.296	.277	.247
	Minimum Premium Ratio	.863	.809	.769	.737	.710	.686	.665	.645	.628	.612	.583	.559	.537	.499
40	Basic Premium Ratio	.686	.592	.530	.484	.448	.418	.392	.371	.352	.336	.308	.286	.267	.237
	Minimum Premium Ratio	.858	.802	.762	.729	.701	.677	.656	.637	.619	.603	.574	.549	.527	.490
39	Basic Premium Ratio	.677	.581	.520	.473	.437	.407	.382	.360	.342	.325	.298	.275	.257	.228
	Minimum Premium Ratio	.852	.796	.754	.721	.693	.669	.648	.628	.610	.594	.566	.541	.519	.482
38	Basic Premium Ratio	.668	.571	.509	.463	.426	.396	.372	.350	.332	.315	.288	.266	.248	.220
	Minimum Premium Ratio	.846	.789	.747	.714	.686	.661	.639	.620	.602	.586	.557	.533	.510	.473
37	Basic Premium Ratio	.659	.562	.499	.453	.416	.387	.362	.340	.322	.306	.279	.257	.240	.212
	Minimum Premium Ratio	.839	.781	.740	.706	.678	.653	.631	.612	.594	.578	.550	.525	.503	.466
36	Basic Premium Ratio	.649	.551	.488	.442	.405	.376	.351	.330	.312	.297	.270	.249	.231	.204
	Minimum Premium Ratio	.832	.774	.732	.698	.670	.645	.624	.604	.586	.570	.542	.517	.496	.459
35	Basic Premium Ratio	.635	.538	.475	.429	.393	.365	.340	.320	.302	.286	.260	.240	.223	.196
	Minimum Premium Ratio	.825	.766	.724	.690	.662	.637	.616	.596	.579	.563	.535	.510	.489	.453
34	Basic Premium Ratio	.623	.525	.463	.418	.382	.354	.330	.309	.292	.277	.252	.231	.215	.189
	Minimum Premium Ratio	.816	.757	.715	.682	.654	.629	.608	.589	.571	.556	.528	.504	.483	.447
33	Basic Premium Ratio	.610	.513	.451	.406	.371	.343	.320	.300	.283	.268	.244	.224	.208	.183
	Minimum Premium Ratio	.808	.749	.707	.674	.646	.622	.600	.582	.564	.549	.521	.498	.477	.442
32	Basic Premium Ratio	.597	.501	.440	.395	.361	.334	.311	.291	.274	.260	.236	.217	.201	.177
	Minimum Premium Ratio	.799	.740	.699	.666	.638	.614	.593	.575	.558	.543	.515	.492	.472	.438
31	Basic Premium Ratio	.582	.486	.425	.382	.348	.321	.299	.280	.264	.250	.226	.208	.193	.171
	Minimum Premium Ratio	.791	.732	.690	.658	.630	.606	.586	.567	.551	.536	.510	.487	.467	.434
30	Basic Premium Ratio	.567	.471	.412	.369	.336	.309	.288	.269	.254	.240	.218	.201	.187	.165
	Minimum Premium Ratio	.782	.723	.681	.649	.622	.599	.579	.561	.545	.530	.504	.482	.463	.430
29	Basic Premium Ratio	.551	.457	.398	.356	.324	.299	.277	.260	.245	.232	.210	.194	.180	.160
	Minimum Premium Ratio	.773	.714	.673	.642	.615	.592	.572	.555	.539	.524	.499	.477	.459	.427
28	Basic Premium Ratio	.537	.444	.386	.344	.313	.287	.266	.249	.234	.221	.200	.184	.171	.151
	Minimum Premium Ratio	.764	.705	.665	.633	.606	.584	.564	.546	.530	.516	.491	.470	.451	.421
27	Basic Premium Ratio	.524	.431	.373	.332	.300	.275	.254	.236	.221	.208	.187	.170	.157	.136
	Minimum Premium Ratio	.755	.697	.655	.623	.596	.573	.552	.534	.518	.502	.476	.453	.433	.400
26	Basic Premium Ratio	.510	.418	.361	.320	.288	.263	.242	.224	.209	.196	.175	.158	.145	.124
	Minimum Premium Ratio	.747	.688	.646	.613	.586	.562	.541	.523	.505	.490	.463	.439	.418	.383
25	Basic Premium Ratio	.497	.405	.348	.307	.276	.251	.230	.213	.198	.185	.164	.147	.134	.114
	Minimum Premium Ratio	.738	.679	.638	.605	.577	.553	.531	.512	.495	.479	.451	.427	.405	.369
24	Basic Premium Ratio	.476	.386	.331	.292	.262	.238	.218	.202	.188	.176	.157	.141	.129	.111
	Minimum Premium Ratio	.727	.669	.628	.596	.569	.546	.525	.506	.490	.474	.447	.423	.402	.367
23	Basic Premium Ratio	.454	.368	.315	.277	.249	.226	.208	.192	.179	.168	.150	.136	.124	.107
	Minimum Premium Ratio	.716	.659	.619	.588	.561	.539	.519	.501	.485	.469	.443	.420	.400	.365
22	Basic Premium Ratio	.434	.351	.300	.264	.237	.216	.198	.184	.172	.161	.144	.131	.120	.104
	Minimum Premium Ratio	.704	.649	.611	.580	.555	.533	.513	.496	.480	.465	.439	.417	.397	.363

Workers' Compensation Insurance

296-17-920

Maximum Premium Ratio:		1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.60	1.70	1.80	2.00
21	Basic Premium Ratio	.414	.335	.286	.252	.226	.206	.190	.176	.165	.155	.139	.126	.117	.102
	Minimum Premium Ratio	.693	.640	.603	.573	.548	.527	.508	.491	.476	.461	.436	.414	.395	.361
20	Basic Premium Ratio	.394	.318	.271	.238	.214	.194	.178	.166	.155	.145	.130	.119	.110	.096
	Minimum Premium Ratio	.683	.631	.595	.566	.541	.520	.502	.485	.470	.456	.431	.410	.391	.358
19	Basic Premium Ratio	.377	.301	.254	.222	.198	.179	.164	.152	.142	.133	.120	.109	.101	.089
	Minimum Premium Ratio	.674	.621	.585	.557	.533	.513	.494	.478	.464	.450	.426	.405	.387	.355
18	Basic Premium Ratio	.358	.283	.238	.207	.184	.166	.152	.140	.131	.123	.110	.101	.094	.083
	Minimum Premium Ratio	.664	.612	.575	.547	.524	.505	.488	.472	.458	.445	.421	.401	.383	.352
17	Basic Premium Ratio	.339	.266	.222	.192	.171	.154	.140	.130	.121	.114	.103	.094	.088	.079
	Minimum Premium Ratio	.654	.602	.567	.539	.517	.497	.480	.466	.453	.440	.418	.398	.380	.350
16	Basic Premium Ratio	.320	.249	.208	.179	.159	.143	.131	.121	.113	.106	.096	.088	.083	.075
	Minimum Premium Ratio	.644	.593	.559	.532	.510	.491	.475	.461	.448	.436	.414	.395	.378	.348
15	Basic Premium Ratio	.303	.234	.194	.168	.148	.134	.122	.113	.106	.100	.091	.084	.079	.072
	Minimum Premium Ratio	.635	.586	.552	.526	.504	.486	.470	.457	.445	.433	.412	.393	.376	.346
14	Basic Premium Ratio	.293	.220	.180	.157	.141	.128	.117	.109	.103	.097	.089	.082	.078	.071
	Minimum Premium Ratio	.630	.579	.545	.521	.501	.483	.468	.455	.443	.432	.411	.392	.375	.346
13	Basic Premium Ratio	.281	.204	.167	.148	.133	.122	.112	.105	.099	.094	.086	.081	.076	.070
	Minimum Premium Ratio	.624	.571	.538	.516	.497	.480	.465	.453	.441	.430	.409	.391	.374	.345
12	Basic Premium Ratio	.269	.187	.156	.139	.126	.116	.108	.101	.096	.091	.084	.079	.075	.069
	Minimum Premium Ratio	.618	.562	.533	.512	.493	.477	.463	.451	.440	.429	.408	.390	.374	.345
11	Basic Premium Ratio	.254	.167	.145	.130	.119	.110	.103	.097	.092	.088	.082	.077	.073	.068
	Minimum Premium Ratio	.611	.552	.527	.507	.490	.474	.461	.449	.438	.427	.407	.389	.373	.344
10	Basic Premium Ratio	.238	.150	.135	.122	.113	.105	.098	.093	.089	.085	.079	.075	.072	.067
	Minimum Premium Ratio	.603	.544	.522	.503	.487	.472	.458	.447	.436	.426	.406	.388	.372	.344
9	Basic Premium Ratio	.219	.138	.125	.115	.106	.100	.094	.089	.085	.082	.077	.073	.071	.066
	Minimum Premium Ratio	.593	.538	.517	.500	.483	.469	.456	.445	.434	.424	.405	.387	.372	.343
8	Basic Premium Ratio	.197	.127	.116	.107	.100	.094	.090	.086	.082	.079	.075	.072	.069	.065
	Minimum Premium Ratio	.582	.532	.513	.496	.480	.466	.454	.443	.433	.423	.404	.387	.371	.343
7	Basic Premium Ratio	.170	.117	.108	.100	.094	.089	.085	.082	.079	.077	.073	.070	.068	.064
	Minimum Premium Ratio	.569	.527	.509	.492	.477	.464	.452	.441	.431	.422	.403	.386	.370	.342
6	Basic Premium Ratio	.137	.107	.100	.094	.089	.085	.081	.078	.076	.074	.071	.068	.066	.064
	Minimum Premium Ratio	.552	.522	.505	.489	.475	.462	.450	.439	.430	.420	.402	.385	.369	.342
5	Basic Premium Ratio	.105	.098	.092	.087	.083	.080	.077	.075	.073	.071	.068	.066	.065	.063
	Minimum Premium Ratio	.536	.518	.501	.486	.472	.459	.448	.438	.428	.419	.400	.384	.369	.342

[Statutory Authority: RCW 51.04.020(1) and 51.16.035. 88-24-010 (Order 88-26), § 296-17-91905, filed 12/1/88, effective 1/1/89; 88-14-107 (Order 88-10), § 296-17-91905, filed 7/6/88; 86-17-002 (Order 86-29), § 296-17-91905, filed 8/8/86. Statutory Authority: RCW 51.16.035. 86-06-018 (Order 86-18), § 296-17-91905, filed 2/25/86.]

WAC 296-17-920 Assessment for supplemental pension fund. The amount of 18.5 mills (\$.0185) shall be retained by each employer from the earnings of each worker for each hour or fraction thereof the worker is employed. Provided that in classifications 6707 and 7102, the employer shall retain fifteen cents per day from each worker and in classification 6708 the employer shall retain 1.8 mills (\$.0018) per hour to be reported for premium calculation under WAC 296-17-350(8) from each worker. The amount of money so retained from the employee shall be matched in an equal amount by each employer, except as otherwise provided in these rules, all such moneys shall be remitted to the department on or before the last day of January, April,

July and October of each year for the preceding calendar quarter, provided self-insured employers shall remit to the department as provided under WAC 296-15-060. All such moneys shall be deposited in the supplemental pension fund.

[Statutory Authority: RCW 51.04.020 and 51.32.073. 87-04-006 (Order 86-49), § 296-17-920, filed 1/23/87. Statutory Authority: RCW 51.16.035. 86-12-041 (Order 86-18), § 296-17-920, filed 5/30/86, effective 7/1/86; 83-24-017 (Order 83-36), § 296-17-920, filed 11/30/83, effective 1/1/84; 82-24-047 (Order 82-38), § 296-17-920, filed 11/29/82, effective 1/1/83; 81-24-042 (Order 81-30), § 296-17-920, filed 11/30/81, effective 1/1/82; 80-17-016 (Order 80-23), § 296-17-920, filed 11/13/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-17-920, filed 11/30/79, effective 1/1/80. Statutory Authority: RCW 51.04.020(1) and 51.16.035. 78-12-043 (Order 78-23), § 296-17-920, filed 11/27/78, effective 1/1/79; Order 77-27, § 296-17-920, filed 11/30/77, effective 1/1/78; Order 77-10, § 296-17-920, filed 5/31/77; Order 76-36, § 296-17-920, filed 11/30/76; Order 75-38, § 296-17-920, filed 11/24/75, effective 1/1/76; Order 75-28, § 296-17-920, filed 8/29/75, effective 10/1/75; Order 74-40, § 296-17-920, filed 11/27/74, effective 1/1/75; Order 74-6, § 296-17-920, filed 1/23/74.]

Chapter 296-18A WAC
REHABILITATION REVIEW

WAC

296-18A-440	Reports.
296-18A-445	Self-insured reports.
296-18A-450	Vocational rehabilitation plan.
296-18A-460	Performance criteria.
296-18A-465	Request for proposal.
296-18A-480	Responsibilities.
296-18A-490	Billing for vocational services.
296-18A-500	Self-insurers.
296-18A-510	Vocational rehabilitation counselor qualifications.
296-18A-520	Job modification assistance.

WAC 296-18A-440 Reports. The following reports are required from the vocational rehabilitation provider for state fund referrals.

(1) Contact report. Contact with the injured worker shall be reported to the department within twenty-one calendar days of the date the referral was sent to the provider. Notification of contact shall be on a department provided form.

(2) Progress reports. A progress report shall be submitted each sixty days unless otherwise authorized by the claim manager. Progress reports will follow a department approved format. The referral source is to be notified immediately of factors affecting plan completion or changes of status or changes in plan costs.

(3) Closing report. Upon completion of the formal program, a closing report to the referral source shall be submitted by the vocational rehabilitation provider. That report shall contain at least the following:

(a) Assessment of the injured worker's employability status at the time of completion of vocational services;

(b) Whether or not the injured worker has returned to work;

(c) Any remaining barriers to the injured worker becoming employable at gainful employment.

[Statutory Authority: RCW 51.16.120(3) and 51.32.095. 88-21-022 (Order 88-24), § 296-18A-440, filed 10/10/88. Statutory Authority: RCW 51.32.095. 85-17-022 (Order 85-20), § 296-18-440 (codified as WAC 296-18A-440), filed 8/13/85.]

WAC 296-18A-445 Self-insured reports. The following reports are required from the self-insurer to be sent to the self-insurance section.

(1) Self-insured rehabilitation referral. A form submitted no later than after paying ninety continuous days of time loss after the initial filing or reopening of a claim. If more time is necessary, an extension may be requested on this form. The format for this form will be supplied by the department.

(2) Employability assessment report. If a vocational referral is not being made and an extension of time is not necessary, this form must be completed and submitted to the self-insured section no later than after paying ninety continuous days of time loss after the initial filing or reopening of a claim. The format for this form will be supplied by the department.

(3) A vocational rehabilitation plan shall be submitted to the self-insurance section by the self-insurer no later than ten calendar days after being signed by the injured

worker, vocational rehabilitation provider and the employer. The plan will follow the criteria established in WAC 296-18A-450.

(4) Closing report. Upon completion of a formal program, the self-insurer will submit the closing report to the department. The closing report must follow the criteria as outlined in WAC 296-18A-440(3).

(5) Rehabilitation outcome report. This form is to be submitted with the final self-insurer's report on occupational injury or disease (SIF-5) or, in the case of medical only claims, with the self-insurers accident report (SIF-2), which is submitted at the time of claim closure. The format for this form will be supplied by the department and applies to all claims where vocational rehabilitation services have been provided.

[Statutory Authority: RCW 51.04.020. 88-12-096 (Order 88-07), § 296-18A-445, filed 6/1/88. Statutory Authority: RCW 51.32.095. 85-17-022 (Order 85-20), § 296-18-445 (codified as WAC 296-18A-445), filed 8/13/85.]

WAC 296-18A-450 Vocational rehabilitation plan.

(1) A vocational rehabilitation plan shall be approved by the referral source prior to its implementation. The plan shall be sent to all individuals with responsibilities under it. The plan shall contain the following:

(a) Assessment of the skills and abilities, based on the physical capacities and mental status, aptitudes, and transferrable skills of the injured worker;

(b) The services necessary to enable the injured worker to become employable at gainful employment;

(c) Labor market information indicating the employability of the injured worker at plan completion;

(d) An estimate of the cost and the time necessary for the completion of the plan;

(e) A direct comparison of the injured worker's skills with potential types of employment to demonstrate a likelihood of success;

(f) If necessary, a job analysis of the injured worker's previous occupation, including earnings, may be included; and

(g) Any other information that will significantly affect the plan.

(2) The following priorities shall be addressed and justification given to why each preceding priority was not used.

(a) Return to the previous job with the same employer;

(b) Modification of the previous job with the same employer including transitional return to work;

(c) A new job with the same employer in keeping with any limitations or restrictions;

(d) Modification of a new job with the same employer including transitional return to work;

(e) Modification of the previous job with a new employer;

(f) A new job with a new employer or self-employment based upon transferable skills;

(g) A new job with a new employer or self-employment involving on-the-job training;

(h) Modification of a new job with a new employer; and

(i) Short-term retraining and job placement.

(3) Each plan shall be signed by the vocational rehabilitation counselor and the injured worker. In state fund cases, a copy will be sent to the employer, attending physician, department, injured worker and any parties with responsibilities within the plan by the vocational rehabilitation counselor. The following statement shall be printed above the signatures:

I have read the above plan and understand its contents. By signing this plan I agree to faithfully execute my responsibilities described in it.

(4) If the plan is interrupted for good cause this case will be returned to the referral source at the discretion of the referral source. At the end of such interruption, the referral source may return the referral to the original vocational provider to resume the plan or its preparation.

[Statutory Authority: Chapters 51.08 and 51.32 RCW. 88-14-011 (Order 88-13), § 296-18A-450, filed 6/24/88. Statutory Authority: RCW 51.04.020(4) and 51.04.030 [51.04.030]. 87-08-004 (Order 87-09), § 296-18A-450, filed 3/20/87. Statutory Authority: RCW 51.32.095. 85-17-022 (Order 85-20), § 296-18-450 (codified as WAC 296-18A-450), filed 8/13/85.]

WAC 296-18A-460 Performance criteria. (1) Vocational rehabilitation providers offering services under RCW 51.32.095 for state fund referrals shall be selected by the department, at the department's sole discretion, based upon providers' performance according to the following criteria.

(2) There shall be objective evaluation by the department's vocational rehabilitation services section, which shall address:

(a) Cost to medical aid fund including fees paid to vocational providers or other providers at the request of the vocational rehabilitation counselor;

(b) Cost to accident fund including time loss compensation, loss of earning power payments, and "training" costs pursuant to RCW 51.32.095(3), paid during the time vocational rehabilitation services are provided;

(c) Cost to second injury fund due to approved job site modifications;

(d) Length of services provided, from time of referral to date of issuance of closing report;

(e) Ratio of referrals to completed plans;

(f) The outcome of the claim at the time of closure of vocational rehabilitation services which identifies the injured worker as (i) employable; (ii) returned to work; or (iii) other.

(3) The vocational rehabilitation services section shall also weigh the various objective criteria listed above by addressing the following subjective criteria:

(a) The ability of the vocational rehabilitation provider and counselor to comply with the rules contained in chapter 296-18A WAC and the law as contained in RCW 51.32.095;

(b) The adequacy of the vocational rehabilitation provider's facilities shall also be considered.

(4) The vocational rehabilitation services section shall solicit proposals, on forms provided by the vocational rehabilitation services section, from all providers on the

department's provider list and shall utilize these in contracting with providers for referrals.

(5) Audits. In order to ensure compliance with the above listed criteria, every vocational rehabilitation provider used by the department shall be subject to an audit of their facilities and files. Audits may be conducted upon petition or upon the department's own initiative. Audits may be for cause or at random and may consist of, but not be limited to, an on-site evaluation of each provider's facilities, files and records, including the accuracy of the records and the accuracy of billing for services. The vocational rehabilitation provider shall receive written notice at least forty-eight hours in advance of such audit.

The audit of vocational rehabilitation providers at locations outside the state of Washington shall be at the expense of the provider and the expense incurred in making such audit shall be paid by the provider.

Such expenses shall be calculated at the usual and normal per diem and travel expense rates established by law and in effect at the time the expenses are incurred.

[Statutory Authority: RCW 51.16.120(3) and 51.32.095. 88-21-022 (Order 88-24), § 296-18A-460, filed 10/10/88. Statutory Authority: RCW 51.32.095 and 51.04.030. 87-10-070 (Order 87-13), § 296-18A-460, filed 5/6/87. Statutory Authority: RCW 51.32.095. 85-17-022 (Order 85-20), § 296-18-460 (codified as WAC 296-18A-460), filed 8/13/85.]

WAC 296-18A-465 Request for proposal. In order to select providers for referrals and adequately evaluate performance, the vocational rehabilitation services section shall solicit proposals from providers on the department's provider list through a request for proposal process. Contracts will be awarded after evaluation of proposals.

[Statutory Authority: RCW 51.16.120(3) and 51.32.095. 88-21-022 (Order 88-24), § 296-18A-465, filed 10/10/88. Statutory Authority: RCW 51.32.095 and 51.04.030. 87-10-071 (Order 87-14), § 296-18A-465, filed 5/6/87.]

WAC 296-18A-480 Responsibilities. All parties will have the following responsibilities in assisting the injured worker to become employable at gainful employment:

(1) The attending physician shall maintain open communication with the injured worker's assigned vocational rehabilitation counselor and the referral source. The attending physician shall respond to any requests for information in a timely fashion and will do all that is possible to expedite the vocational rehabilitation process, including making an estimate of physical capacities or restrictions. The attending physician may review the vocational plan, and if the attending physician feels that the injured worker is not physically capable of carrying out the plan, or the plan is unnecessary, based on current medical findings, shall notify the referral source immediately of this opinion with the reasons for such opinion.

(2) The claims unit within the department shall:

(a) Notify the employer of the referral to a vocational rehabilitation provider;

(b) Send the employer a copy of the closing report; and

(c) Give written notice to an injured worker if a complaint of noncooperation has been made.

(3) The employer shall assist the vocational rehabilitation counselor in any way necessary to collect data regarding the former gainful employment of the injured worker. Further, the employer will assist the vocational rehabilitation counselor and attending physician to determine whether or not a modified job could be made available for employment of the injured worker.

(4) The injured worker shall cooperate with all reasonable requests from all responsible individuals in determining disability, developing and implementing the rehabilitation process. Should the injured worker fail to be cooperative, the sanctions as set out in RCW 51.32-.110 shall be applied.

(5) In assisting the injured worker to become employable at gainful employment, the provider is to follow the priorities as set out in RCW 51.32.095. Vocational rehabilitation providers actually assisting the injured worker shall have the burden of showing that they meet the qualifications to be a vocational rehabilitation counselor as set out in these rules. The vocational rehabilitation provider shall comply with all the rules in chapter 296-18A WAC and Title 51 RCW, whether the injured worker is referred by the department or a self-insurer under the following criteria:

(a) Develop a formal program to assist the eligible injured worker to become employable at gainful employment;

(b) Maintain accurate records that will be periodically reviewed by department staff;

(c) Notify the referral source of noncooperative behavior on the part of the injured worker; and

(d) Keep all parties informed of the progress and development of the formal program.

[Statutory Authority: RCW 51.16.120(3) and 51.32.095. 88-21-022 (Order 88-24), § 296-18A-480, filed 10/10/88. Statutory Authority: RCW 51.04.020(4) and 51.04.030 [51.04.030]. 87-08-004 (Order 87-09), § 296-18A-480, filed 3/20/87. Statutory Authority: RCW 51.32.095. 85-17-022 (Order 85-20), § 296-18-480 (codified as WAC 296-18A-480), filed 8/13/85.]

WAC 296-18A-490 Billing for vocational services.

(1) Vocational rehabilitation providers must comply with the rules contained in chapter 296-20 WAC as they pertain.

(2) Vocational rehabilitation providers must carry general liability insurance, automobile liability insurance, errors and omission/malpractice insurance, and industrial insurance if required by Title 51 RCW.

(3) All vocational services must be prior authorized by the referral source, except immediate job placement. If immediate job placement activities exceed thirty days, authorization must be obtained for further services.

(4) Charges for the following are considered overhead and will not be paid:

(a) Administrative and supervisory salaries and related personnel expenses;

(b) Office rent;

(c) Depreciation;

(d) Equipment purchase and rental;

(e) Telephone expenses including long distance phone call charges;

(f) Postage;

(g) Shipping;

(h) Expendable supplies;

(i) Printing costs;

(j) Copier costs;

(k) Maintenance and repair;

(l) Taxes;

(m) Automobile costs and maintenance;

(n) Insurance;

(o) Dues and subscriptions;

(p) Professional services;

(q) Vacation, sick leave, and other expenses of a similar nature;

(r) Internal staffing time;

(s) Filing of material in case files, setting up files;

(t) Activities associated with reports other than writing or dictating original draft of the report (e.g., editing, filing, distribution, revising, typing, and mailing);

(u) Generating and keeping internal recordkeeping forms;

(v) Time spent on any administrative and clerical activity, including typing, copying, mailing, distributing, filing, payroll, recordkeeping, delivering mail, picking up mail;

(w) Activities associated with counselor training, general discussion regarding office procedures, internal case file reviews by supervisors, meetings, and seminars;

(x) Unanswered phone calls; and

(y) Any other item or service not specifically identified and separately billable.

(5) All bills must be itemized on referral source approved bill forms. The billed charges must be justified in the provider's case records and be consistent with written reports. If charges are not documented, or justified, or consistent, payment may be reduced, denied, or recouped.

(6) Vocational services must be billed using procedure codes, fees, and methods provided by the department of labor and industries. The department will publish codes, fees, and procedures and provide this information to all vocational rehabilitation providers receiving department referrals. Fees shall be established by the department and reviewed at regular intervals.

[Statutory Authority: RCW 51.32.095, 51.04.030, 51.36.100 and 51.36.110. 87-10-072 (Order 87-15), § 296-18A-490, filed 5/6/87. Statutory Authority: RCW 51.32.095. 85-17-022 (Order 85-20), § 296-18-490 (codified as WAC 296-18A-490), filed 8/13/85.]

WAC 296-18A-500 Self-insurers. (1) No later than paying ninety continuous days of time loss following the initial filing or reopening of a claim, the self-insurer shall notify the self-insurance section as to whether or not vocational rehabilitation services are necessary and likely to enable the injured worker to become employable at gainful employment. Each of these cases will be reviewed by the self-insurance section. The criteria to determine employability will be the same as for the state fund. If the injured worker is determined employable, the self-insurer will submit an employability assessment

form which contains objective reasons why the injured worker is employable. Within twenty calendar days of receipt of an employability assessment form, the supervisor's designee within the self-insurance section will inform the self-insurer and the injured worker as to whether or not self-insurers determination of employability is approved. If an employability determination cannot be made due to medical instability, the self-insured shall request an extension by notifying the self-insurance section of the injured worker's condition and when a determination can be made. If the request for extension is not approved, notice will be sent within fifteen calendar days of receipt.

(2) The supervisor's designee within the self-insurance section of the department will receive from the self-insurer the vocational rehabilitation plan signed by the injured worker and employer. Within ten calendar days of receipt of the vocational plan, the supervisor's designee will inform the self-insurer, the vocational rehabilitation counselor and the injured worker that the plan has been received. A review of the vocational rehabilitation plan by the supervisor's designee will be initiated upon request by the employer or the injured worker. Reasons for the review must be stated in writing. A request for a plan review must be made prior to completion or termination of the plan. If necessary, conflict resolution techniques, such as conferences and fact-finding, will be used in order to resolve problems with the plan in as fair and expedient manner as possible. The supervisor's designee shall notify the parties of the plan review results no later than sixty days from the date the request was received.

Disputes of the supervisor's designee's determination must be submitted to the director in accordance with WAC 296-18A-470.

(3) Upon completion of the formal program, the self-insurer will submit to the self-insurance section a closing report. Within ten calendar days of receipt of the closing report, the supervisor's designee shall inform the injured worker and employer that vocational services have concluded.

(4) The self-insurer shall provide the self-insurance section with a rehabilitation outcome report on a form prescribed by the department. The rehabilitation outcome report shall be attached to the final self-insurer's report on occupational injury or disease (SIF-5) or, in the case of medical only claims, with the self-insurers accident report (SIF-2), which is submitted at the time of claim closure. A rehabilitation outcome report will be submitted on all claims where vocational rehabilitation services have been provided.

[Statutory Authority: RCW 51.04.020. 88-12-096 (Order 88-07), § 296-18A-500, filed 6/1/88. Statutory Authority: RCW 51.32.095. 85-17-022 (Order 85-20), § 296-18-500 (codified as WAC 296-18A-500), filed 8/13/85.]

WAC 296-18A-510 Vocational rehabilitation counselor qualifications. (1) All vocational rehabilitation counselors who were registered by the department prior to May 16, 1985, will remain on the list and be eligible

to receive referrals. The department is not obligated to make referrals to anyone on this list.

(2) When it is determined an injured worker is eligible for vocational rehabilitation services, the referral source shall authorize such services. Selection of the appropriate provider of vocational services is at the sole discretion of the referral source. Selected vocational rehabilitation counselors must meet one or more of the following categories of experience and education:

(a) A doctorate or masters degree in rehabilitation counseling, psychology, counseling and guidance, social work, or educational psychology; and a minimum of one year of experience in vocational counseling, job placement, vocational assessment, or other documented areas of vocational rehabilitation services with industrially injured workers;

(b) A masters degree with twenty-four credit hours in a combination of rehabilitation philosophy, rehabilitation history, rehabilitation ethics, medical aspects of disability, psychological aspects of disability, job placement, occupational information, counseling theory, personal and vocational adjustment, work evaluation, practicum in subjects listed in this subsection, or coursework relating to counseling and subjects listed in this subsection; and a minimum of two years of experience in vocational counseling, job placement, vocational assessment, or other documented areas of vocational rehabilitation services with industrially injured workers;

(c) A bachelors degree in rehabilitation counseling, psychology, counseling and guidance, social work, or educational psychology; and a minimum of two years of experience in vocational counseling, job placement, vocational assessment, or other documented areas of vocational rehabilitation services with industrially injured workers; or

(d) A bachelors degree with twenty-four credit hours in a combination of rehabilitation philosophy, rehabilitation history, rehabilitation ethics, medical aspects of disability, psychological aspects of disability, job placement, occupational information, counseling theory, personal and vocational adjustment, work evaluation, practicum in subjects listed in this subsection, or coursework relating to counseling and subjects listed in this subsection; and a minimum of three years of experience in vocational counseling, job placement, vocational assessment, or other documented areas of vocational rehabilitation services; with industrially injured workers;

(e) Has been a registered vocational counselor in Washington state.

(3) An intern is an individual who meets the minimum educational requirements as set forth in subsection (2)(a) through (e) of this section, but not the experience requirements. When the intern is employed, the vocational rehabilitation provider shall provide the name of the intern's supervisor. The intern supervisor will be responsible for all rehabilitation work done by the intern. The intern supervisor will co-sign all reports submitted by the intern. The intern must be designated as such on all reports. At the end of the time requirement the intern may apply for or identification number as a fully qualified vocational rehabilitation counselor.

(4) In order to receive or maintain a provider account number, the provider shall submit an application form provided by the department. The owner or legal representative of the provider must sign the application form. The provider shall also submit the names and signatures of all counselors working for the provider. The provider shall also submit official sealed copies of each counselor's college transcripts unless the counselor is already on the department's provider list, the department having completed a check of qualifications and having sent written notice of their acceptance. If counselors employed by the provider are not on the department's provider list, completed applications signed by each counselor must be submitted on a form provided by the department. The application form must include a statement of each counselor's experience providing vocational rehabilitation to industrially injured workers and the names of former and current employers and supervisors.

(5) It is the responsibility of the vocational counselor and provider to be familiar with the industrial insurance rules and laws of the state of Washington. The vocational counselor and provider must act in a professional manner and comply with the code of professional ethics for vocational rehabilitation counselors.

[Statutory Authority: RCW 51.32.095, 87-10-073 (Order 87-16), § 296-18A-510, filed 5/6/87; 85-17-022 (Order 85-20), § 296-18-510 (codified as WAC 296-18A-510), filed 8/13/85.]

WAC 296-18A-520 Job modification assistance. (1) As provided for in section 13, chapter 63, Laws of 1982 (RCW 51.32.250), the supervisor or supervisor's designee in his or her discretion may pay job modification costs in an amount not to exceed five thousand dollars from the department per worker per job modification. This payment is intended to be a cooperative participation with the employer and funds shall be taken from the appropriate account within the second injury fund. The employer may add to this amount with their own contribution.

(2) An employer requesting job modification assistance must submit to the department a job modification assistance application.

(3) The job modification assistance application shall include, but not be limited to:

(a) A document supporting the need for job modification;

(b) A description of the job modification; and

(c) An itemized account of each expense to be incurred in the job modification. Job modification assistance applications shall be submitted on a form prescribed by the department.

(4) The supervisor or supervisor's designee shall accept, reject, or modify the job modification application within thirty days of receipt. Notification of the supervisor's acceptance, rejection, or modification shall be in writing.

[Statutory Authority: Chapters 51.08 and 51.32 RCW, 88-14-011 (Order 88-13), § 296-18A-520, filed 6/24/88. Statutory Authority: RCW 51.32.095, 85-17-022 (Order 85-20), § 296-18-520 (codified as WAC 296-18A-520), filed 8/13/85.]

Chapter 296-20 WAC MEDICAL AID RULES

WAC

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DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-20-140	Conversion factor table—Anesthesia. [Statutory Authority: RCW 51.04.020(4) and 51.04.030, 87-03-004 (Order 86-45), § 296-20-140, filed 1/8/87; 83-24-016 (Order 83-35), § 296-20-140, filed 11/30/83, effective 1/1/84; 82-24-050 (Order 82-39), § 296-20-140, filed 11/29/82, effective 7/1/83. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3), 81-24-041 (Order 81-28), § 296-20-140, filed 11/30/81, effective 1/1/82; 80-18-033 (Order 80-24), § 296-20-140, filed 12/1/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035, 79-12-086 (Order 79-18), § 296-20-140, filed 11/30/79, effective 1/1/80; Order 77-27, § 296-20-140, filed 11/30/77, effective 1/1/78; Order 76-34, § 296-20-140, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-20-140, filed 11/28/75, effective 1/1/76; Order 74-39, § 296-20-140, filed 11/22/74, effective 4/1/75; Order 74-7, § 296-20-140, filed 1/30/74.] Repealed by 88-24-011 (Order 88-28), filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.04.020(4) and 51.04.030.
296-20-145	Conversion factor table—Surgery. [Statutory Authority: RCW 51.04.020(4) and 51.04.030, 87-03-004 (Order 86-45), § 296-20-145, filed 1/8/87; 83-24-016 (Order 83-35), § 296-20-145, filed 11/30/83, effective 1/1/84; 82-24-050 (Order 82-39), § 296-20-145, filed 11/29/82, effective 7/1/83. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3), 81-24-041 (Order 81-28), § 296-20-145, filed 11/30/81, effective 1/1/82; 80-18-033 (Order 80-24), § 296-20-145, filed 12/1/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035, 79-12-086 (Order 79-18), § 296-20-145, filed 11/30/79, effective 1/1/80; Order 77-27, § 296-20-145, filed 11/30/77, effective 1/1/78; Order 76-34, § 296-20-145, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-20-145, filed 11/28/75, effective 1/1/76; Order 74-7, § 296-20-145, filed 1/30/74.] Repealed by 88-24-011 (Order 88-28), filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.04.020(4) and 51.04.030.
296-20-150	Conversion factor table—Radiology. [Statutory Authority: RCW 51.04.020(4) and 51.04.030, 87-03-004 (Order 86-45), § 296-20-150, filed 1/8/87; 83-24-016 (Order 83-35), § 296-20-150, filed 11/30/83, effective 1/1/84. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3), 81-24-041 (Order 81-28), § 296-20-150, filed 11/30/81, effective 1/1/82; 80-18-033 (Order 80-

24), § 296-20-150, filed 12/1/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-20-150, filed 11/30/79, effective 1/1/80; Order 77-27, § 296-20-150, filed 11/30/77, effective 1/1/78; Order 76-34, § 296-20-150, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-20-150, filed 11/28/75, effective 1/1/76; Order 74-7, § 296-20-150, filed 1/30/74.] Repealed by 88-24-011 (Order 88-28), filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.04.020(4) and 51.04.030.

296-20-155

Conversion factor table—Pathology. [Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-004 (Order 86-45), § 296-20-155, filed 1/8/87; 83-24-016 (Order 83-35), § 296-20-155, filed 11/30/83, effective 1/1/84. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-20-155, filed 11/30/81, effective 1/1/82; 80-18-033 (Order 80-24), § 296-20-155, filed 12/1/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-20-155, filed 11/30/79, effective 1/1/80; Order 77-27, § 296-20-155, filed 11/30/77, effective 1/1/78; Order 76-34, § 296-20-155, filed 11/24/76, effective 1/1/77; Order 74-7, § 296-20-155, filed 1/30/74.] Repealed by 88-24-011 (Order 88-28), filed 12/1/88, effective 1/1/89. Statutory Authority: RCW 51.04.020(4) and 51.04.030.

WAC 296-20-010 General information. (1) The following rules and fees are promulgated pursuant to RCW 51.04.020. This fee schedule is intended to cover all services for accepted industrial insurance claims. All fees listed are the maximum fees allowable. Practitioners shall bill their usual and customary fee for services. IF A USUAL AND CUSTOMARY FEE FOR ANY PARTICULAR SERVICE IS LOWER TO THE GENERAL PUBLIC THAN LISTED IN THE FEE SCHEDULE, THE PRACTITIONER SHALL BILL THE DEPARTMENT OR SELF-INSURER AT THE LOWER RATE. The department or self-insurer will pay the lesser of the billed charge or the fee schedule maximum allowable.

(2) The rules contained in the introductory section pertain to all practitioners regardless of specialty area or limitation of practice. Additional rules pertaining to specialty areas will be found in the appropriate section.

(3) The maximum allowable fee for a procedure is determined by multiplying the unit value of a procedure by the appropriate conversion factor, per the conversion factor tables listed in WAC 296-20-135 to 296-20-155.

(4) Initial and follow-up visit charges by practitioners include routine examinations, physical modalities, injections, minor procedures, etc., not otherwise provided for in this schedule. No fee is payable for missed appointments unless the appointment is for an examination arranged by the department or self-insurer.

(5) When a claim has been accepted by the department or self-insurer, no provider or his/her representative may bill the worker for the difference between the allowable fee and his usual and customary charge. Nor can the worker be charged a fee, either for interest or completion of forms, related to services rendered for the industrial injury or condition.

(6) Practitioners must maintain documentation in claimant medical or health care service records adequate to verify the level, type, and extent of services provided to claimants.

(7) Except as provided in WAC 296-20-055 (temporary treatment of unrelated conditions when retarding recovery), practitioners shall bill, and the department or self-insurer shall pay, only for medically necessary services required for the diagnosis and curative or rehabilitative treatment of the accepted condition.

(8) When an injured worker is being treated concurrently for an unrelated condition the fee allowable for the service(s) rendered must be shared proportionally between the payors.

(9) Correspondence: Correspondence pertaining to state fund and department of energy claims should be sent to Department of Labor and Industries, Claims Administration, MS: HC-241, Olympia, Washington 98504. Accident reports should be sent to Department of Labor and Industries, P.O. Box 9001, Olympia, Washington 98504-9001. Billings should be sent to Department of Labor and Industries, P.O. Box 9002, Olympia, Washington 98504-9002. State fund claims have six digit numbers preceded by a letter other than "S," "T," or "V."

Department of energy claims have seven digit numbers with no letter prefix.

All correspondence and billings pertaining to *crime victims* claims should be sent to Crime Victims Division, Department of Labor and Industries, 925 Plum Street, MS: HC-720, Olympia, Washington 98504.

Crime victim claims have six digit numbers preceded by a "V."

All correspondence and billings pertaining to self-insured claims should be sent directly to the employer or his service representative as the case may be. A listing of self-insured employers and service representatives can be found in Appendix B.

Self-insured claims are six digit numbers preceded by a "S," or "T."

Communications to the department or self-insurer must show the patient's full name and claim number. If the claim number is unavailable, providers should contact the department or self-insurer for the number, indicating the patient's name, Social Security number, the date and the nature of the injury, and the employer's name. A communication should refer to one claim only. Correspondence must be legible and reproducible, as department records are microfilmed. Correspondence regarding specific claim matters should be sent directly to the department in Olympia or self-insurer in order to avoid rehandling by the service location.

(10) APPENDIX C is a listing of the department's various local service locations. These facilities should be utilized by providers to obtain information, supplies, or assistance in dealing with matters pertaining to industrial injuries.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-24-050 (Order 87-23), § 296-20-010, filed 11/30/87, effective 1/1/88; 86-20-074 (Order 86-36), § 296-20-010, filed 10/1/86, effective 11/1/86; 86-06-032 (Order 86-19), § 296-20-010, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-20-010, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-20-010, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-20-010, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-20-010, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-20-010, filed

11/28/75, effective 1/1/76; Order 74-7, § 296-20-010, filed 1/30/74; Order 70-12, § 296-20-010, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-010, filed 11/27/68, effective 1/1/69.]

WAC 296-20-0100 Chiropractic advisory committee. (1) The director or the director's designee shall appoint a chiropractic advisory and utilization review committee.

(2) The committee will function as an advisor to the department with respect to policies affecting chiropractic care, quality assurance, clinical management of cases, utilization review, and the establishment of rules. It shall advise and assist the department in the department's relationship with providers of chiropractic care, and assist the department in ensuring that injured workers receive good quality chiropractic care in a safe and effective manner.

(3) The chiropractic advisory committee shall:

(a) Advise the department on standards as to what constitutes effective and accepted chiropractic treatment, for use by attending chiropractors and for chiropractic consultants to use in reviewing cases referred for consultation;

(b) Advise the department on standards and minimum credentials for chiropractic consultants and the content of consultant reports; and

(c) Review the performance of individual chiropractors and chiropractic consultants for conformance with standards and requirements and advise the department of instances where standards and requirements have not been met.

The department shall review the advice and recommendations of the committee and shall promulgate those standards and requirements which it chooses to adopt. The department shall review the advice from the committee on the performance of chiropractors and shall act upon this advice at its sole discretion.

(4) The committee will meet on a monthly basis or as needed. The department will reimburse members of the committee for travel and incidental expenses related to the meetings.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 88-24-011 (Order 88-28), § 296-20-0100, filed 12/1/88, effective 1/1/89.]

WAC 296-20-01002 Definitions. **TERMINATION OF TREATMENT:** When treatment is no longer required and/or the industrial condition is stabilized, a report indicating the date of stabilization should be submitted to the department or self-insurer. This is necessary to initiate closure of the industrial claim. The patient may require continued treatment for conditions not related to the industrial condition; however, financial responsibility for such care must be the patient's.

UNUSUAL OR UNLISTED PROCEDURE: Value of unlisted services or procedures should be substantiated "by report" (BR).

"BY REPORT": BR (by report) in the value column indicates that the value of this service is to be determined by report (BR) because the service is too unusual, variable or new to be assigned a unit value. The report should provide an adequate definition or description of

the services or procedure (e.g., operative or narrative report), using any of the following as indicated:

(1) Diagnosis;

(2) Size, location and number of lesion(s) or procedure(s) where appropriate;

(3) Major surgical procedure and supplementary procedure(s);

(4) Whenever possible, list the nearest similar procedure by number according to this schedule;

(5) Estimated follow-up;

(6) Operative time.

The department or self-insurer may adjust BR procedures when such action is indicated.

"INDEPENDENT OR SEPARATE PROCEDURE": Certain of the listed procedures are commonly carried out as an integral part of a total service, and as such do not warrant a separate charge. When such a procedure is carried out as a separate entity, not immediately related to other services, the indicated value for "independent procedure" is applicable.

SV. ITEMS: Sv (service) procedures are not essentially a single procedure, rather they are comprised of several other procedures. These "Sv" procedures although identified by a specific code number, can be *described* only in terms of the several services included. Therefore, unit values are not indicated for Sv procedures and total value is derived from the values of the individual services performed. These Sv procedures require "BR" (see above) information to substantiate billing.

MODIFIED WORK STATUS: The injured worker is not able to return to his previous work, but is physically capable of carrying out work of a lighter nature. Injured workers should be urged to return to modified work as soon as reasonable as such work is frequently beneficial for body conditioning and regaining self confidence.

Under RCW 51.32.090, when the employer has modified work available for the worker, the employer must furnish the doctor and the worker with a statement describing the available work in terms that will enable the doctor to relate the physical activities of the job to the worker's physical limitations and capabilities. The doctor shall then determine whether the worker is physically able to perform the work described. The employer may not increase the physical requirements of the job without requesting the opinion of the doctor as to the worker's ability to perform such additional work. If after a trial period of reemployment the worker is unable to continue with such work, his time loss compensation will be resumed upon certification by the attending doctor.

If the employer has no modified work available, the department should be notified immediately, so vocational assessment can be conducted to determine whether the worker will require assistance in returning to work.

REGULAR WORK STATUS: The injured worker is physically capable of returning to his/her regular work. It is the duty of the attending doctor to notify the worker and the department or self-insurer, as the case may be, of the specific date of release to return to regular work. Compensation will be terminated on the release date. Further treatment can be allowed as requested by the

attending doctor if the condition is not stationary and such treatment is needed and otherwise in order.

TOTAL TEMPORARY DISABILITY: Full-time loss compensation will be paid when the worker is unable to return to any type of reasonably continuous gainful employment as a direct result of an accepted industrial injury or exposure.

TEMPORARY PARTIAL DISABILITY: Partial time loss compensation may be paid when the worker can return to work on a limited basis or return to lesser paying job is necessitated by the accepted injury or condition. The worker must have a reduction in wages of at least five percent before consideration of partial time loss can be made. No partial time loss compensation can be paid after the worker's condition is stationary.

ALL TIME LOSS COMPENSATION MUST BE CERTIFIED BY THE ATTENDING DOCTOR BASED ON OBJECTIVE FINDINGS.

PERMANENT PARTIAL DISABILITY: Any anatomic or functional abnormality or loss after maximum rehabilitation has been achieved, which is determined to be stable or nonprogressive at the time the evaluation is made. When the attending doctor has reason to believe a permanent impairment exists, the department or self-insurer should be notified. Specified disabilities (amputation or loss of function of extremities, loss of hearing or vision) are to be rated utilizing a nationally recognized impairment rating guide. Unspecified disabilities (internal injuries, spinal injuries, mental health, etc.) are to be rated utilizing the category system detailed under WAC 296-20-200 et al. for injuries occurring on or after October 1, 1974. Appendix D contains a schedule of the permanent disability maximum awards. UNDER WASHINGTON LAW DISABILITY AWARDS ARE BASED SOLELY ON PHYSICAL OR MENTAL IMPAIRMENT DUE TO THE ACCEPTED INJURY OR CONDITIONS WITHOUT CONSIDERATION OF ECONOMIC FACTORS.

TOTAL PERMANENT DISABILITY: Loss of both legs or arms, or one leg and one arm, total loss of eyesight, paralysis or other condition permanently incapacitating the worker from performing any work at any gainful employment. When the attending doctor feels a worker may be totally and permanently disabled, he should communicate this information immediately to the department or self-insurer. A vocational evaluation and an independent rating of disability may be arranged by the department prior to a determination as to total permanent disability. Coverage for treatment does not usually continue after the date an injured worker is placed on pension.

FATAL: When the attending doctor has reason to believe a worker has died as a result of an industrial injury or exposure, the doctor should notify the nearest department service location (see Appendix C) or the self-insurer immediately. Often an autopsy is required by the department or self-insurer. If so, it will be authorized by the service location manager or the self-insurer. Benefits payable include burial stipend and monthly payments to the surviving spouse and/or dependents.

DOCTOR: For these rules, means a person licensed to practice one or more of the following professions: Medicine and surgery; osteopathic; chiropractic; drugless therapeutics; podiatry; dentistry; optometry.

Only those persons so licensed may sign report of accident forms and time loss cards except as provided in WAC 296-20-100.

HEALTH SERVICES PROVIDER OR PROVIDER: For these rules means any person, firm, corporation, partnership, association, agency, institution, or other legal entity providing any kind of services related to the treatment of an industrially injured worker. It includes, but is not limited to, hospitals, medical doctors, dentists, chiropractors, vocational rehabilitation counselors, osteopaths, pharmacists, podiatrists, physical therapists, occupational therapists, massage therapists, psychologists, drugless therapeutics, and durable medical equipment dealers.

PRACTITIONER: For these rules, means any person defined as a "doctor" under these rules, or licensed to practice one or more of the following professions: Audiology; physical therapy; occupational therapy; pharmacy; prosthetics; orthotics; psychology; nursing; physician or osteopathic assistant; and massage therapy.

PHYSICIAN: For these rules, means any person licensed to perform one or more of the following professions: Medicine and surgery; or osteopathic.

ACCEPTANCE, ACCEPTED CONDITION: Determination by a qualified representative of the department or self-insurer that reimbursement for the diagnosis and curative or rehabilitative treatment of a claimant's medical condition is the responsibility of the department or self-insurer. The condition being accepted must be specified by one or more diagnosis codes from the current edition of the International Classification of Diseases, Clinically Modified (ICD-CM).

AUTHORIZATION: Notification by a qualified representative of the department or self-insurer that specific medically necessary treatment, services, or equipment provided for the diagnosis and curative or rehabilitative treatment of an accepted condition will be reimbursed by the department or self-insurer.

MEDICALLY NECESSARY: Those health services are medically necessary which, in the opinion of the director or his or her designee, are:

- (a) Proper and necessary for the diagnosis and curative or rehabilitative treatment of an accepted condition; and
- (b) Reflective of accepted standards of good practice within the scope of the provider's license or certification; and
- (c) Not delivered primarily for the convenience of the claimant, the claimant's attending doctor, or any other provider; and
- (d) Provided at the least cost and in the least intensive setting of care consistent with the other provisions of this definition.

In no case shall services which are inappropriate to the accepted condition or which present hazards in excess of the expected medical benefits be considered medically necessary. Services which are controversial, obsolete, experimental, or investigational are presumed

not to be medically necessary, and shall be authorized only as provided in WAC 296-20-03002(6).

UTILIZATION REVIEW: The assessment of a claimant's medical care to assure that it is medically necessary and of good quality. This assessment typically considers the appropriateness of the place of care, level of care, and the duration, frequency or quantity of services provided in relation to the accepted condition being treated.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-24-050 (Order 87-23), § 296-20-01002, filed 11/30/87, effective 1/1/88; 86-20-074 (Order 86-36), § 296-20-01002, filed 10/1/86, effective 11/1/86; 83-24-016 (Order 83-35), § 296-20-01002, filed 11/30/83, effective 1/1/84; 83-16-066 (Order 83-23), § 296-20-01002, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-20-01002, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-20-01002, filed 12/23/80, effective 3/1/81.]

WAC 296-20-022 Payment of out-of-state providers. (1) Beginning February 1, 1987, providers of health services in the bordering states of Oregon and Idaho shall bill and be paid according to the medical aid rules of the state of Washington.

(2) Providers of health services in other states and other countries shall be paid at rates which take into account:

(a) Payment levels allowed under the state of Washington medical aid rules;

(b) Payment levels allowed under workers compensation programs in the provider's place of business; and

(c) The reasonableness of the provider's charges.

(3) In all cases these payment levels are the maximum allowed to providers of health services to injured workers. Should a health services provider's charge exceed the payment amount allowed under the state of Washington medical aid rules, the provider is prohibited from charging the injured worker for the difference between the provider's charge and the allowable rate. Providers violating this provision are ineligible to treat injured workers as provided by WAC 296-20-015 and are subject to other applicable penalties.

(4) Only those diagnostic and treatment services authorized under the state of Washington medical aid rules may be allowed by the department or self-insurer. As determined by the department of labor and industries, the scope of practice of providers in bordering states may be recognized for payment purposes, except that in all cases WAC 296-20-03002 (Treatment not authorized) shall apply. Specifically, services permitted under workers compensation programs in the provider's state or country of business, but which are not allowed under the medical aid rules of the state of Washington, may not be reimbursed. When in doubt, the provider should verify coverage of a service with the department or self-insurer.

(5) Out-of-state hospitals will be paid according to WAC 296-23A-165.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-24-050 (Order 87-23), § 296-20-022, filed 11/30/87, effective 1/1/88; 87-03-004 (Order 86-45), § 296-20-022, filed 1/8/87.]

WAC 296-20-024 Utilization review and quality assurance. To ensure that injured workers receive good

quality health care, provided in an efficient manner and in the most appropriate setting, the department has instituted a program of utilization review and quality assurance. This program is designed to monitor and control the use of health care services, and includes, but is not limited to, the following:

(1) Authorization for reimbursement must be obtained from a qualified representative of the department or self-insurer prior to the provision of certain medical treatment, equipment or supplies. This requirement applies to all nonemergent major surgery, diagnostic studies other than routine radiology and laboratory studies, therapy extending beyond a specified number of days or treatments, and to certain other medical treatment, equipment and supplies. Emergency medical services can be provided without prior authorization, but reimbursement may be withheld, or recovery of prior payments made, if utilization review fails to confirm the medical necessity of such services.

(2) Medical treatment, equipment and supplies which are normally reimbursed without prior authorization are nevertheless subject to specific limitations with respect to the duration, frequency, and quantity that may be provided without review. If such services are delivered in excess of the limitations which apply to them, reimbursement will not be made unless prior authorization has been obtained from a qualified representative of the department or self-insurer.

(3) Certain types of medical treatment, equipment and supplies are not approved for the diagnosis or treatment of accepted conditions, and will not be authorized or reimbursed by the department or self-insurer.

(4) Specific limitations are placed on the duration, frequency and types of prescription drugs and controlled substances that will be reimbursed by the department or self-insurer.

(5) Documentation of the need for and efficacy of continued medical care by the health care provider is required at regular intervals while a claim is open. Such documentation enables the department or self-insurer to review the plan of treatment, assess the quality and medical necessity of services, authorize or deny reimbursement for continued provision of services, evaluate eligibility for time loss compensation, and pay medical bills.

(6) The department's second opinion program requires consultations prior to the authorization of reimbursement for some types of surgery, for all procedures of a controversial or uncommon nature, and for conservative or chiropractic care which extends past 120 days following the initial visit.

(7) Hospitalization will be reimbursed only when it is determined to be medically necessary for the diagnosis and curative or rehabilitative treatment of accepted conditions. Hospital bills and supporting medical documents may be audited to verify the accuracy or appropriateness of charges, and recovery of overpayments will be made.

(8) Medical treatment, equipment and supplies provided for the diagnosis and curative or rehabilitative

treatment of a condition unrelated to the accepted medical condition will not be reimbursed unless prior authorization has been obtained from the department or self-insurer.

(9) The department's mandatory outpatient surgery program requires that certain diagnostic and surgical procedures be reimbursed only if they are performed in an outpatient setting. If a worker's medical condition necessitates performance of such a procedure in an inpatient setting, prior authorization must be obtained from the department or self-insurer.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-24-050 (Order 87-23), § 296-20-024, filed 11/30/87, effective 1/1/88.]

WAC 296-20-035 Treatment in cases that remain open beyond sixty days. Conditions requiring treatment beyond sixty days are indicative of a major industrial condition or complication by other conditions. Except in cases of severe and extensive injuries, i.e., quadriplegia, paraplegia, multiple fractures, etc., when the injured worker requires treatment beyond sixty days following injury, a complete examination is necessary to determine and/or establish need for continued treatment and/or payment of time loss compensation. This may be accomplished either by the attending doctor or a consultation exam. In either case, a detailed exam report must be provided to the department or self-insurer. The following information is required. Additional information may be included or requested.

(1) Attending doctor report.

(a) The condition(s) diagnosed including ICD-9-CM codes and the objective and subjective findings.

(b) Their relationship, if any, to the industrial injury or exposure.

(c) Outline of proposed treatment program, its length, components, and expected prognosis including an estimate of when treatment should be concluded and condition(s) stable. An estimated return to work date should be included. The probability, if any, of permanent partial disability resulting from industrial conditions should be noted.

(d) If the worker has not returned to work, the attending doctor should indicate whether he feels vocational assessment will be necessary to evaluate the worker's ability to return to work and why.

(e) If the claimant has not returned to work, a doctor's estimate of physical capacities should be included with the report. If further information regarding physical capacities is needed or required, a performance-based physical capacities evaluation can be requested. Performance-based physical capacities evaluations should be conducted by a licensed occupational therapist or a licensed physical therapist. Performance-based physical capacities evaluations may also be conducted by other qualified professionals who provided performance-based physical capacities evaluations to the department prior to May 20, 1987, and who have received written approval to continue supplying this service based on formal department review of their qualifications.

(2) Consultation exam.

(a) A DETAILED HISTORY TO ESTABLISH:

(i) The type and severity of the industrial injury or occupational disease.

(ii) The patient's previous physical and mental health.

(iii) Any social and emotional factors which may effect recovery.

(b) A COMPARISON HISTORY between history provided by attending doctor and injured worker, must be provided with exam.

(c) A DETAILED PHYSICAL EXAMINATION concerning all systems affected by the industrial accident.

(d) A GENERAL PHYSICAL EXAMINATION sufficient to demonstrate any preexisting impairments of function or concurrent condition.

(e) A COMPLETE DIAGNOSIS OF ALL PATHOLOGICAL CONDITIONS INCLUDING ICD-9-CM CODES FOUND TO BE LISTED:

(i) Due solely to injury.

(ii) Preexisting condition aggravated by the injury and the extent of aggravation.

(iii) Other medical conditions neither related to nor aggravated by the injury but which may retard recovery.

(iv) Coexisting disease (arthritis, congenital deformities, heart disease, etc.).

(f) CONCLUSIONS MUST INCLUDE:

(i) Type treatment recommended for each pathological condition and the probable duration of treatment.

(ii) Expected degree of recovery from the industrial condition.

(iii) Probability, if any, of permanent disability resulting from the industrial condition.

(iv) Probability of returning to work.

(g) REPORTS OF NECESSARY, REASONABLE X-RAY AND LABORATORY STUDIES TO establish or confirm the diagnosis when indicated.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030 [51.04.030]. 87-08-004 (Order 87-09), § 296-20-035, filed 3/20/87. Statutory Authority: RCW 51.04.020(4) and 51.04.030. 86-06-032 (Order 86-19), § 296-20-035, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-20-035, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-20-035, filed 12/23/80, effective 3/1/81; Order 71-6, § 296-20-035, filed 6/1/71; Order 70-12, § 296-20-035, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-035, filed 11/27/68, effective 1/1/69.]

WAC 296-20-075 Hospitalization. Hospitalization will be paid when medically necessary for treatment of the accepted condition(s). Unless the worker's condition requires special care, ward or semi-private accommodations will be paid. Hospitalization solely for physical therapy, bed rest, and/or administration of injectable drugs will be paid only under the following circumstances:

(a) Acute back pain with objective findings of neurological deficit, e.g., foot drop, motor dysfunction or other symptoms indicative of a herniated disc;

(b) Chronic back pain, which has been treated for a minimum of ten days with home bed rest, traction, outpatient physical therapy, and medication without improvement and where the worker has objective physical findings.

Discharge from the hospital shall be at the earliest date possible consistent with proper health care. If

transfer to a convalescent center or nursing home is indicated, prior arrangements should be made with the department or self-insurer. See WAC 296-20-091 for further information. The department may designate those diagnostic and surgical procedures which will be reimbursed only if performed in an outpatient setting. When procedures so designated must be performed in an inpatient setting for reasons of medical necessity, prior authorization must be obtained.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-24-050 (Order 87-23), § 296-20-075, filed 11/30/87, effective 1/1/88; 86-20-074 (Order 86-36), § 296-20-075, filed 10/1/86, effective 11/1/86; 86-06-032 (Order 86-19), § 296-20-075, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-01-100 (Order 80-29), § 296-20-075, filed 12/23/80, effective 3/1/81; Order 71-6, § 296-20-075, filed 6/1/71; Order 70-12, § 296-20-075, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-075, filed 11/27/68, effective 1/1/69.]

WAC 296-20-1102 Special equipment rental and purchase prosthetic and orthotics equipment. The department or self-insurer will authorize and pay rental fee for equipment or devices if the need for the equipment will be for a short period of treatment during the acute phase of condition. Rental extending beyond sixty days requires prior authorization. If the equipment will be needed on long term basis, the department or self-insurer will consider purchase of the equipment or device. The department's or self-insurer's decision to rent or purchase an item of medical equipment will be based on a comparison of the projected rental costs of the item with its purchase price. An authorized representative of the department or self-insurer will decide whether to rent or purchase certain items, provided they are appropriate and medically necessary for treatment of the claimant's accepted industrial condition. Decisions to rent or purchase items will be based on the following information:

- (1) Purchase price of the item.
- (2) Monthly rental fee.
- (3) The prescribing doctor's estimate of how long the item will be needed.

The prescribing doctor must obtain prior authorization from the department or self-insurer, for rental or purchase of special equipment or devices.

The department or self-insurer will authorize and pay for prosthetics and orthotics as needed by claimant and substantiated by attending doctor. If such items are furnished by the attending doctor, the department or self-insurer will reimburse the doctor his cost for the item. In addition, a handling fee, not to exceed five percent of the wholesale cost of the item, will be paid. See WAC 296-20-124 for information regarding replacement of such items on closed claims.

The department or self-insurer will repair or replace originally provided damaged, broken, or worn-out prosthetics, orthotics, or special equipment devices upon documentation and substantiation from the attending doctor.

Provision of such equipment requires prior authorization.

THE GRAVITY GUIDING SYSTEM, GRAVITY LUMBAR REDUCTION DEVICE, BACKSWING AND OTHER INVERSION TRACTION EQUIPMENT MAY ONLY BE USED IN A SUPERVISED SETTING. RENTAL OR PURCHASE FOR HOME USE WILL NOT BE ALLOWED.

EQUIPMENT NOT REQUIRING PRIOR AUTHORIZATION INCLUDES CRUTCHES, CERVICAL COLLARS, LUMBAR AND RIB BELTS, AND OTHER COMMONLY USED ORTHOTICS OF MINIMAL COST.

PERSONAL APPLIANCES SUCH AS VIBRATORS, HEATING PADS, HOME FURNISHINGS, HOT TUBS, WATERBEDS, EXERCISE BIKES, EXERCISE EQUIPMENT, JACUZZIES, ETC. WILL NOT BE AUTHORIZED OR PAID.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-22-052 (Order 87-22), § 296-20-1102, filed 11/2/87; 86-06-032 (Order 86-19), § 296-20-1102, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-20-1102, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-20-1102, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-20-1102, filed 12/23/80, effective 3/1/81.]

WAC 296-20-12050 Special programs. (1) The department or self-insurer may from time to time enter into special agreements for services provided by, or under the direction of, licensed providers authorized to bill the department. Special agreements are for services other than routine services covered under the fee schedule, and may include multi-disciplinary or inter-disciplinary programs such as pain management, work hardening, and physical conditioning.

(2) The department shall establish payment rates for special agreements, and may establish outcome criteria, measures of effectiveness, minimum staffing levels, certification requirements, special reporting requirements and such other criteria as will ensure injured workers receive good quality and effective services at a prudent cost.

(3) Special agreements shall be purchased at the discretion of the department or self-insurer. The department may terminate special programs from the industrial insurance program upon thirty days notice to the provider.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-24-050 (Order 87-23), § 296-20-12050, filed 11/30/87, effective 1/1/88.]

WAC 296-20-125 Billing procedures. All services rendered must be in accordance with the medical aid rules. The department or self-insurer may reject bills for services rendered in violation of these rules. The injured worker may not be billed for services rendered in violation of these rules.

(1) Bills must be itemized on department or self-insurer forms or other forms which have been approved by the department or self-insurer. Bills may also be transmitted electronically on department provided software, or transmitted electronically using department file format specifications. Providers using any of the electronic transfer options must follow department instructions for electronic billing. Physicians, osteopaths, advanced registered nurse practitioners, chiropractors, naturopaths,

podiatrists, psychologists, and registered physical therapists use the national standard HCFA 1500 health insurance claim form with the bar code placed 2/10 of an inch from the top and 1 1/2 inches from the left side of the form. Hospitals use the UB-82 billing form for institution services and the national standard HCFA 1500 health insurance claim form with the bar code placed 2/10 of an inch from the top and 1 1/2 inches from the left side of the form for professional services. Pharmacies use the department's statement for pharmacy services (F-245-100). Dentists, equipment suppliers, transportation services, home health services, vocational services, and massage therapists use the department's statement for miscellaneous services (F-245-72). Providers may obtain billing forms from the department's local service locations (see Appendix C for listing).

(2) Bills must specify the date and type of service, the appropriate procedure code, the condition treated, and the charges for each service.

(3) Bills submitted to the department must be completed to include the following:

- (a) Worker's name and address;
- (b) Worker's claim number;
- (c) Date of injury;
- (d) Referring doctor's name and L & I provider account number;
- (e) Area of body treated, including ICD-9-CM code(s), identification of right or left, as appropriate;
- (f) Dates of service;
- (g) Place of service;
- (h) Type of service;
- (i) Appropriate procedure code, hospital revenue code, or national drug code;
- (j) Description of service;
- (k) Charge;
- (l) Units of service;
- (m) Tooth number(s);
- (n) Total bill charge;
- (o) The name and address of the practitioner rendering the services and the provider account number assigned by the department;
- (p) Date of billing;
- (q) Submission of supporting documentation required under subsection (6) of this section.

(4) Responsibility for the completeness and accuracy of the description of services and charges billed rests with the practitioner rendering the service, regardless of who actually completes the bill form;

(5) Vendors are urged to bill on a monthly basis. Bills must be received within ninety days of service to be considered for payment.

(6) The following supporting documentation is required when billing for services:

- (a) Laboratory and pathology reports;
- (b) X-ray findings;
- (c) Operative reports;
- (d) Office notes;
- (e) Consultation reports;
- (f) Special diagnostic study reports;
- (g) For BR procedures - see WAC 296-20-010 for requirements; and

(h) Special or closing exam reports.

(7) The claim number must be placed on each bill and on each page of reports and other correspondence in the upper right-hand corner.

(8) Rebills. If you do not receive payment or notification from the department within ninety days, services may be rebilled. Rebills must be submitted for services denied if a claim is closed or rejected and subsequently reopened or allowed. Rebills should be identical to the original bill: Same charges, codes, and billing date. Please indicate rebill on the bill.

Any inquiries regarding adjustment of charges must be submitted within ninety days from the date of payment to be considered.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-20-125, filed 7/23/87; 86-20-074 (Order 86-36), § 296-20-125, filed 10/1/86, effective 11/1/86; 86-06-032 (Order 86-19), § 296-20-125, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-20-125, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-01-100 (Order 80-29), § 296-20-125, filed 12/23/80, effective 3/1/81; Order 77-27, § 296-20-125, filed 11/30/77, effective 1/1/78; Emergency Order 77-26, § 296-20-125, filed 12/1/77; Emergency Order 77-16, § 296-20-125, filed 9/6/77; Order 75-39, § 296-20-125, filed 11/28/75, effective 1/1/76; Order 74-39, § 296-20-125, filed 11/22/74, effective 1/1/75; Order 74-7, § 296-20-125, filed 1/30/74; Order 71-6, § 296-20-125, filed 6/1/71; Order 70-12, § 296-20-125, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-125, filed 11/27/68, effective 1/1/69.]

WAC 296-20-132 Determination of conversion factor adjustments. Adjustments to the conversion factors for the specialty areas of medicine, surgery, anesthesiology, radiology, and pathology may occur on January 1st of each year following prior public hearings.

Such adjustments will be based on the estimated increase/decrease in the state's average wage for the current year. The following calendar year's estimate will be adjusted to reflect the actual increase/decrease in the state's average wage for the preceding year.

The total percentage change for any one calendar year for all five conversion factors may not exceed the total of the estimated increase/decrease in the current year, plus or minus the actual adjustment for the preceding calendar year. However, apportionment of the adjustments may be made between the various speciality areas to provide parity between the components of the fee schedule.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 88-24-011 (Order 88-28), § 296-20-132, filed 12/1/88, effective 1/1/89; 82-24-050 (Order 82-39), § 296-20-132, filed 11/29/82, effective 1/1/84.]

WAC 296-20-135 Conversion factors. (1) The following conversion factors are the base fees for determining the maximum amount paid by the department for procedures with specified unit values. To determine the maximum amount paid, the unit value for a specific procedure is multiplied by the appropriate conversion factor or base fee listed below.

(2) The conversion factor or base fee for medicine, chiropractic, physical therapy, drugless therapeutics and nurse practitioner procedure codes is \$1.29.

(3) The conversion factor or base fee for anesthesia is \$19.18.

(4) The conversion factor or base fee for radiology is \$5.92.

(5) The conversion factor or base fee for pathology is \$.56.

(6) The conversion factor or base fee for surgery is \$67.83.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 88-24-011 (Order 88-28), § 296-20-135, filed 12/1/88, effective 1/1/89; 87-03-004 (Order 86-45), § 296-20-135, filed 1/8/87; 83-24-016 (Order 83-35), § 296-20-135, filed 11/30/83, effective 1/1/84; 82-24-050 (Order 82-39), § 296-20-135, filed 11/29/82, effective 7/1/83. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-20-135, filed 11/30/81, effective 1/1/82; 80-18-033 (Order 80-24), § 296-20-135, filed 12/1/80, effective 1/1/81. Statutory Authority: RCW 51.04.030 and 51.16.035. 79-12-086 (Order 79-18), § 296-20-135, filed 11/30/79, effective 1/1/80; Order 77-27, § 296-20-135, filed 11/30/77, effective 1/1/78; Order 76-34, § 296-20-135, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-20-135, filed 11/28/75, effective 1/1/76; Order 74-7, § 296-20-135, filed 1/30/74; Order 71-6, § 296-20-135, filed 6/1/71; Order 68-7, § 296-20-135, filed 11/27/68, effective 1/1/69.]

WAC 296-20-140 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-20-145 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-20-150 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-20-155 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-20-210 General rules. These general rules establish a uniform standard for conducting examinations and submitting reports of examinations. These general rules must be followed by physicians who make examinations or evaluations of permanent bodily impairment.

(1) Examinations for the medical determination of the extent of permanent bodily impairment shall be made only by physicians currently licensed to practice medicine and surgery.

(2) Whenever an examination is made, the physician shall record, among other pertinent information, the complete history as obtained from the person examined; the complete history of past injuries and diseases; the complaints; the age, sex, height and weight; x-ray findings and diagnostic tests made or reviewed in connection with the examination; the diagnosis; and all findings, including negative findings, in all bodily areas and systems where a detailed review of systems reveals past or present complaints. The physician shall record his conclusions as to: Whether the residuals of the injury are fixed; whether treatment is required for the injury and, if so, any treatment shall be described. If the examining physician finds residuals of the injury are fixed, he shall

record the appropriate category or categories of permanent impairment for diagnoses attributable to the industrial injury or occupational disease. Conditions or impairments not attributable to the industrial injury or occupational disease shall be described and diagnosed in the report, with a description of how they affect the person examined and the appropriate category of permanent impairment where possible.

(3) The examining physician shall not assign a percentage figure for permanent bodily impairment described in the categories established herein.

(4) Reports shall specify diagnoses and medical terms as listed in current procedural terminology (CPT), current medical information and terminology (CMIT), international classification of diseases adopted (ICDA), or standard nomenclature of disease, except when otherwise specified in these rules.

(5) Workers who are scheduled for disability examinations are allowed to bring with them an accompanying person to be present during the physical examination. The accompanying person cannot be compensated in any manner, except that language interpreters may be necessary for the communication process and may be reimbursed for interpretative services.

The department may designate those conditions under which the accompanying person is allowed to be present during the disability examination process.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 88-14-012 (Order 88-09), § 296-20-210, filed 6/24/88; Order 74-32, § 296-20-210, filed 6/21/74, effective 10/1/74.]

Chapter 296-21 WAC

MEDICAL FEES

WAC

296-21-011	Footnotes.
296-21-013	Special services and billing procedures.
296-21-015	Office visits.
296-21-025	Hospital visits.
296-21-026	Extended care facility, convalescent hospital, and nursing home.
296-21-027	Emergency room service.
296-21-030	Consultations.
296-21-035	Independent medical examinations.
296-21-040	Independent medical examinations single examiner.
296-21-045	Independent medical examinations two or more examiners.
296-21-046	Immunization injections.
296-21-057	Monitoring services.
296-21-066	Cardiovascular.
296-21-075	Allergy and clinical immunology.
296-21-128	Special services and billing procedures—Anesthesia.

WAC 296-21-011 Footnotes.

+ BR: By Report; see WAC 296-20-01002 for detailed information.

@ Listed units represent basic anesthesia value only; add value for time. See WAC 296-21-130 for calculating total anesthesia values.

MEDICINE MODIFIERS

Unit
Value

Listed values for most procedures may be modified under certain circumstances. When applicable, the modifying circumstance should be identified by the addition of the appropriate "modifier code number" (including the hyphen) after the usual procedure number. The value should be listed as a single modified total for the procedure. When multiple modifiers are applicable to a single procedure, see modifier code -99.

	Unit Value	
-22		UNUSUAL SERVICES: When the services provided are greater than those usually required for the listed procedure, identify by adding this modifier (-22) to the usual procedure number. List modified value. May require report BR
-26		PROFESSIONAL COMPONENT: The listed values of certain procedures (laboratory, x-ray, specific diagnostic and therapeutic services, etc.) are a combination of a physician component and a technical component. When the physician component is billed separately, identify by adding this modifier (-26) to the usual procedure number. Payment is made on the basis of up to and including forty percent of the fee maximum.
-52		REDUCED VALUES: Under certain circumstances, the listed value for a procedure is reduced or eliminated because of ground rules, common practice, or at the physician's election (e.g., the management of a patient in diabetic coma involving detention with patient in critical condition, with spinal tap, gastric lavage, multiple arterial punctures, cutdown, etc.). Under these or similar circumstances, the services provided can be identified by their usual procedure numbers and the use of a reduced value indicated by adding this modifier (-52) to the procedure number. (Use of this modifier provides a means of reporting services at a reduced charge without disturbing usual relative values.)
-55		POSTOPERATIVE MANAGEMENT ONLY: When one physician performs the postoperative management and another physician has performed the surgical procedure, the postoperative component may be identified by adding the modifier '-55' to the usual procedure number.
-56		PREOPERATIVE MANAGEMENT ONLY: When one physician performs the preoperative care and evaluation and another physician performs the surgical procedure, the preoperative component may be identified by adding the modifier '-56' to the usual procedure number.
-75		CONCURRENT CARE, SERVICES RENDERED BY MORE THAN ONE PHYSICIAN: When the patient's condition requires the additional services of more than one physician, each physician may identify his or her services by adding the modifier '-75' to the basic service performed.
-76		REPEAT PROCEDURE BY SAME PHYSICIAN: The physician may need to indicate that a procedure or service was repeated subsequent to the original service. This circumstance may be reported by adding the modifier '-76' to the repeated service.
-77		REPEAT PROCEDURE BY ANOTHER PHYSICIAN: The physician may need to indicate that a basic procedure performed by another physician had to be repeated. This situation may be reported by adding modifier '-77' to the repeated service.
-90		REFERENCE (OUTSIDE) LABORATORY: When laboratory procedures are performed by other than the billing physician, the procedure(s) shall be identified by adding this modifier (-90) to the usual single or panel procedure number and shall be billed as charged to the physician.

	Unit Value	Unit Value
-99 MULTIPLE MODIFIERS: Under certain circumstances multiple modifiers may be applicable. Under such circumstances, identify by adding this modifier (-99) to the usual procedure number and briefly indicate the circumstances. Value in accordance with appropriate modifiers BR		(e.g., to report on tests and/or laboratory results; to clarify or alter previous instructions; to adjust therapy)
	99014	intermediate, 15 - 30 minutes 10.0
		(e.g., to provide advice to an established patient on a new problem; to initiate therapy that can be handled by telephone; to discuss results of tests in detail)
	99015	lengthy or complex 15.0
		(e.g., lengthy counseling session with anxious or distraught patient; detailed or prolonged discussion with family member regarding seriously ill patient)
	99024	Postoperative follow-up visit, included in global service BR
		(See WAC 296-22-010)
	99025	Initial (new patient) visit when asterisk (*) surgical procedure constitutes major service at that visit 20.0
	99030	Mileage, one way, each mile beyond 7 mile radius of point of origin (office or home), per mile 2.0
	99040	Completion of certificate of disability card 2.0
	99044	Doctor's estimate of physical capacities 10.0
	99050	Services requested after office hours in addition to basic service 10.0
	99052	Services requested between 10:00 p.m. and 8:00 a.m. in addition to basic services provided the office is closed during this period of time 12.0
	99054	Services requested on Sundays and holidays in addition to basic services 12.0
	99056	Services provided at request of patient in a location other than physician's office which are normally provided in the office BR
	99058	Office services provided on an emergency basis BR
		(For hospital-based emergency care facility services, see 90500 et seq.)
	99062	Emergency care facility services: When the nonhospital-based physician is in the hospital but is involved in patient care elsewhere and is called to the emergency facility to provide emergency services 8.0
99000 Handling and/or conveyance of specimen for transfer from the physician's office to a laboratory 6.0		
99001 Handling and/or conveyance of specimen for transfer from the patient in other than a physician's office to a laboratory (distance may be indicated) 8.0		
99002 Handling, conveyance, and/or any other service in connection with the implementation of an order involving devices (e.g., designing, fitting, packaging, handling, delivery or mailing) when devices such as orthotics, protectives, prosthetics are fabricated by an outside laboratory or shop but which items have been designed, and are to be fitted and adjusted by the attending physician 12.0		
		(For routine collection of venous blood, use 36415)
		(99012 Telephone calls has been deleted. To report, use 99013-99015)
99013 Telephone call for consultation or medical management; simple or brief, under 15 minutes 5.0		

	Unit Value	Unit Value
(For hospital-based emergency care facility services, see 90500 et seq.)		99151 more than one hour 50.0
99064 Emergency care facility services: When the nonhospital-based physician is called to the emergency facility from outside the hospital to provide emergency services; not during regular office hours 25.0	25.0	CRITICAL CARE
99065 during regular office hours 16.0	16.0	Critical care includes the care of critically ill patients in a variety of medical emergencies that requires the constant attention of the physician (cardiac arrest, shock, bleeding, respiratory failure, postoperative complications, critically ill neonate). Critical care is usually, but not always, given in a critical care area, such as the coronary care unit, intensive care unit, respiratory care unit, or the emergency care facility. The descriptors for critical care are intended to include cardiopulmonary resuscitation and a variety of services attendant to this procedure as well as other acute emergency situations. Separate procedure codes for services performed during this period, such as placement of catheters, cardiac output measurement, management of dialysis, control of gastrointestinal hemorrhage, electrical conversion of arrhythmia, etc., are excluded when this descriptor is used on a per hour basis. (The physician may list his services separately if he desires.)
99070 Supplies and materials (except spectacles) provided by the physician over and above those usually included with the office visit or other services rendered (list drugs, trays, supplies or materials cast room and/or casting supplies provided). Bill at cost BR	BR	99160 Critical care, initial, including the diagnostic and therapeutic services and direction of care of the critically ill or multiple injured or comatose patient, requiring the prolonged presence of the physician; each hour 100.0
(For spectacles, see 92390-92395)		99162 additional 30 minutes 50.0
99075 Medical testimony approved in advance by office of attorney general. First hour 240.0	240.0	(99165, 99166 have been deleted. To report, use 99199)
99076 Each additional 30 minutes 80.0	80.0	(For monitoring cardiac output, see 78470, 93561, 93962)
99080 Special reports as insurance forms, sixty-day report, or the review of medical data to clarify a patient's status—more than the information conveyed in the usual medical communications or standard reporting form at department request (see WAC 296-20-06101 for reporting requirements) BR	BR	(For monitoring intra-aortic balloon counter pulsation, see 33972)
99082 Unusual travel (e.g., transportation and escort of patient) per mile 2.0	2.0	(For subsequent visits, see appropriate critical care visit, 99171-99174 or hospital visits, 90200-90280)
99083 Copies of medical records requested by the department or self-insurance or their representative(s), not required to support billing for services rendered, per page 0.2	0.2	99170 Gastric intubation, and aspiration or lavage for treatment (e.g., for ingested poisons) SV
99084 Maximum allowed per claim 4.6	4.6	99171 Critical care, subsequent follow-up visit; brief examination, evaluation and/or treatment for same illness SV
99085 Physician called on to convey instructions by telephone to hospital emergency room or nurse practitioner clinic—to be paid only to initial attending physician upon completion of report of accident form 12.0	12.0	99172 limited examination, evaluation and/or treatment, same or new illness SV
99095 Deposition approved in advance by office of attorney general. First hour 200.0	200.0	99173 intermediate examination, evaluation and/or treatment, same or new illness SV
99096 Each additional 30 minutes 67.0	67.0	99174 extended reexamination, reevaluation and/or treatment, same or new illness SV
99150 Detention, prolonged, with patient requiring physician attendance beyond usual service (e.g., critically ill patient, 30 minutes to one hour) 25.0	25.0	

	Unit Value
OTHER SERVICES	
99175 Ipecac or similar administration for individual emesis and continued observation until stomach adequately emptied of poison	SV
(For diagnostic intubation, see 82926-82932, 89130-89141)	
(For gastric lavage for diagnostic purposes, see 91055)	
99180 Hyperbaric oxygen pressurization; initial	12.0
99182 Subsequent	3.0
99185 Hypothermia; regional	BR
99186 total body	BR
99190 Assembly and operation of pump with oxygenator or heat exchanger (with or without ECG and/or pressure monitoring); each hour	60.0
99191 3/4 hour	45.0
99192 1/2 hour	30.0
99195 Phlebotomy, therapeutic (separate procedure)	20.0
99199 Unlisted special service or report	BR
(For monitoring cardiac output, see 78470, 93561, 93962)	
(For monitoring intra-aortic balloon counterpulsation, see 33972)	
(For subsequent visits, see appropriate hospital visits, 90200-90280)	
(For physicians assigned to critical care units or other long-term attendance, use special reports)	

DEFINITIONS

Definitions and items of commonality. Terms and phrases common to the practice of medicine are defined as follows and apply to procedures 90000 through 90696.

- (1) **NEW PATIENT:** A patient who is new to the physician or a known patient with a new industrial injury or condition, and whose medical and administrative record need to be established.
- (2) **ESTABLISHED PATIENT:** A patient known to the physician and/or whose records are usually available.
- (3) **INITIAL VISIT:** Initial care, including physical examination and initiation of diagnostic and treatment program, for a condition regardless of whether the patient is known to the physician.
- (4) **FOLLOW-UP VISIT:** Subsequent care for a patient and condition known to the physician.
- (5) **CONSULTATION:** A consultation includes services rendered by a physician whose opinion or advice is requested by a physician or other appropriate source for

the further evaluation and/or management of the patient. When the consulting physician assumes responsibility for the continuing care of the patient, any subsequent service rendered by him will cease to be a consultation. The consulting physician cannot assume care without the concurrence of the patient or the referring doctor. See WAC 296-20-051. Five levels of consultation are recognized: Limited, intermediate, extensive, comprehensive, and consultation of complexity. See WAC 296-21-030 for description.

(6) **REFERRAL: (Transfer)** A referral is the transfer of the total or specific care of a patient from one physician to another and does not constitute a consultation. Initial evaluation and subsequent services are designated as listed below in levels of service.

(7) **INDEPENDENT PROCEDURE:** Certain listed procedures are commonly undertaken as an integral part of a total service. When such a procedure is undertaken as a separate entity, the designation "independent procedure" is appropriate. For example: A patient being seen in consultation by an ophthalmologist and it is necessary for him to perform a gonioscopy or a ophthalmoscopy with intravenous fluorescein as diagnostic procedures in connection with the consultation, then they would be considered as independent procedures. Another example would be cardiac monitoring with electronic equipment in intrathoracic or other critical surgery.

(8) **LEVELS OF SERVICE:** Examinations, evaluations, treatment, counseling, conferences with or concerning patients, and services which necessitate wide variations in skill, effort and time required for the diagnosis and treatment of illness and the promotion of optimal health. Six levels are recognized:

MINIMAL: A level of service including injections, dressings, minimal care, etc., not necessarily requiring the presence of the physician.

For example:

- (a) Routine immunization for tetanus administered by a nurse.
- (b) Blood pressure determination by a nurse for medication control.
- (c) Removal of sutures from laceration.

BRIEF: A level of service requiring a brief period of time, with minimal effort by the physician.

For example:

- (a) Certification of time loss in a stable or chronic case.
- (b) Reexamination of minor trauma (e.g., contusion or abrasion).
- (c) Examination of conjunctiva by the physician in a patient with subconjunctival hemorrhage, irrigation, medication and removal of foreign body with instrument.
- (d) Review of interval history, physical status, and adjustment of medication in patient with compensated arteriosclerotic heart disease on chronic diuretic therapy.

LIMITED: A level of service requiring limited effort or judgment, such as abbreviated or interval history, limited examination or discussion of findings and/or treatment.

For example:

- (a) Review and examination of uncomplicated sprains and strains with initiation, continuation and/or change of treatment.
- (b) Examination of an extremity fracture not requiring reduction.
- (c) Postoperative care in instances where the unit value is for surgical procedure only.

INTERMEDIATE: A level of service such as a complete history and physical examination of one or more organ systems, complicated with a new diagnostic or management problem not necessarily relating to the primary diagnosis that necessitates the obtaining and evaluation of pertinent history and physical or mental status findings, diagnostic tests and procedures, and the ordering of appropriate therapeutic management or an in depth counseling or discussion of the findings, but not requiring a comprehensive examination of the patient as a whole.

For example:

- (a) Review of interval history; examination of neck veins, lungs, heart, abdomen and extremities, discussion of findings and prescription of treatment in decompensated arteriosclerotic heart disease.
- (b) Review of interval history, examination of musculoskeletal system, discussion of findings, and adjustment of therapeutic program in low back and/or arthritic disorders.
- (c) Review of recent illness: Examination of pharynx, neck, axilla, groin, and abdomen; interpretation of laboratory tests and prescription of treatment in infectious mononucleosis.
- (d) Evaluation of a chest, post trauma, with impaired respiration with development of shock.

EXTENDED: A level of service requiring an unusual amount of effort or judgment with report to include a detailed history, review of medical records, examination, conclusions of x-ray or laboratory studies, diagnosis and recommendations for treatment, and a formal conference with patient or family. This service may, or may not involve a complete examination of the patient as a whole.

For example:

- (a) Reexamination of neurological findings, detailed review of hospital studies and course, and formal conference with patient and family jointly concerning findings and plans in a diagnostic problem of suspected intracranial disease in a young adult.
- (b) Detailed intensive review of studies and hospital course and thorough reexamination of pertinent physical findings of a patient with a recent coronary infarct with complications requiring constant physician bedside attention.

(c) Review of results of diagnostic evaluation, performance of a detailed examination and a thorough discussion of physical findings, laboratory studies, x-ray examinations, diagnostic conclusions and recommendations for treatment of complicated chronic pulmonary disease.

(d) Detailed review of studies and hospital course and thorough reexamination of pertinent physical findings of a patient with a recent coronary infarct and formal conference with patient or family to review findings and prognosis.

(e) Reevaluation of a psychotic delusional patient who develops severe and acute abdominal pain involving a mental status reassessment but not a psychiatric diagnostic interview, and a conference with the consulting surgeon and nursing personnel.

(f) Detailed intensive review of studies and hospital course and thorough reexamination of pertinent findings of a patient with a recently diagnosed uterine adenocarcinoma who also has a pulmonary coin lesion under consideration for thoracotomy; this service involves several abbreviated conferences with consultants, and family or patient.

COMPREHENSIVE: A level of service providing an in depth evaluation of the patient with a new or existing problem requiring the development or complete reevaluation of medical data. This procedure includes the recording of a chief complaint(s), and present illness, family history, past medical history, personal history, system review, a complete physical examination, and the ordering of appropriate diagnostic tests and procedures.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-24-050 (Order 87-23), § 296-21-013, filed 11/30/87, effective 1/1/88; 87-16-004 (Order 87-18), § 296-21-013, filed 7/23/87; 86-06-032 (Order 86-19), § 296-21-013, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-21-013, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-21-013, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-21-013, filed 12/23/80, effective 3/1/81; Order 74-39, § 296-21-013, filed 11/22/74, effective 1/1/75; Order 74-7, § 296-21-013, filed 1/30/74.]

WAC 296-21-015 Office visits.

Unit Value

INITIAL VISIT

90000	BRIEF evaluation, history, examination and/or treatment and submission of a report	20.0
90001	Completion of report of accident	12.0
90010	Initial LIMITED history and physical examination, including initiation of diagnostic and treatment program and submission of a report. (Routine visit involving a single region or organ system)	30.0

	Unit Value
90015 Initial INTERMEDIATE history and physical examination, including initiation of diagnostic and treatment program and submission of a report. (Serious or complicated case involving one or more regions or organ systems. Complexity or complication must be indicated in report)	50.0
90017 Extended-initial office visit including history and physical exam, and initiation of treatment program with submission of a report in addition to the report of accident	60.0
90020 Initial COMPREHENSIVE history and physical examination, including initiation of diagnostic and treatment program with submission of a report in addition to the report of accident. (A complex case requiring an unusual amount of time, skill or judgment and an evaluation of the patient as a whole and accompanied with a detailed report)	70.0

FOLLOW-UP VISITS

90030 MINIMAL service (e.g., Injection, immunization, minimal dressing) (Independent procedure)	8.0
90040 BRIEF examination, evaluation and/or treatment with office notes	12.0
90050 LIMITED examination, evaluation and/or treatment with office notes.	16.0
90060 INTERMEDIATE examination, evaluation and/or treatment. (Serious or complicated case involving one or more regions and/or organ systems, and accompanied with a detailed report)	20.0
90070 EXTENDED reexamination or reevaluation requiring an unusual amount of time, skill or judgment, but not necessitating a complete examination or reexamination of the patient as a whole accompanied by a detailed report	30.0
90080 COMPREHENSIVE reexamination or reevaluation requiring complete reevaluation of the patient as a whole accompanied by a detailed report	50.0

90097 Completion of a reopening application. An initial office visit fee will be paid for this reopening examination when justified by a report. Diagnostic studies and x-ray studies associated with the reopening examination will be allowed in addition to this fee	12.0
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(For special narrative reports, at department or self-insurer request, see code 99080.)

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-21-015, filed 7/23/87. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-21-015, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-21-015, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-21-015, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-21-015, filed 11/22/74, effective 4/1/75; Order 74-7, § 296-21-015, filed 1/30/74; Order 71-6, § 296-21-015, filed 6/1/71; Order 68-7, § 296-21-015, filed 11/27/68, effective 1/1/69.]

WAC 296-21-025 Hospital visits.

	Unit Value
NEW OR ESTABLISHED PATIENTS	
90200 Initial hospital care, BRIEF or LIMITED history and physical examination, including initiation of diagnostic and treatment program, preparation of hospital records. (Routine visit involving a single region or organ system)	30.0
90215 Initial hospital care, INTERMEDIATE history and physical examination, including initiation of diagnostic and treatment program and preparation of hospital records. (Serious or complicated case involving one or more regions and/or organ systems and indicated in a report)	50.0
90220 Initial hospital care, COMPREHENSIVE history and physical examination, including initiation of diagnostic and treatment program and preparation of hospital records. (A complex case requiring an unusual amount of time, skill or judgment and evaluation of the patient as a whole accompanied by a detailed report in addition to the report of accident)	70.0

FOLLOW-UP VISITS

90240 BRIEF examination, evaluation and/or treatment, same illness. (Follow-up hospital care)	12.0
90250 LIMITED examination, evaluation and/or treatment. Report required. (Routine follow-up hospital care)	20.0

Medical Fees

296-21-027

	Unit Value
90260 INTERMEDIATE examination, evaluation and/or treatment. Report required. (Serious or complicated case involving one or more regions or organ systems)	30.0
90270 EXTENDED reexamination or reevaluation, requiring an unusual amount of time, skill or judgment, but not necessitating a complete examination or reevaluation of the patient as a whole accompanied by a report	40.0
90280 Comprehensive examination, evaluation or treatment. Report required.	50.0
90292 Hospital discharge day management accompanied by a report	30.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-21-025, filed 7/23/87. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-21-025, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-21-025, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-21-025, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-21-025, filed 11/22/74, effective 4/1/75; Order 74-7, § 296-21-025, filed 1/30/74; Order 70-12, § 296-21-025, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-21-025, filed 11/27/68, effective 1/1/69.]

WAC 296-21-026 Extended care facility, convalescent hospital, and nursing home. Convalescent, rehabilitation or long-term care services.

Convalescent, rehabilitative or long-term care involves active, definitive, professional care of a patient.

	Unit Value
NEW OR ESTABLISHED PATIENT	
90300 Initial care, BRIEF or LIMITED history and physical examination, including initiation of diagnostic and treatment program and preparation of records. (Routine visit involving a single region or organ system)	30.0
90315 Initial care, INTERMEDIATE history and physical examination, including initiation of diagnostic and treatment program and preparation of records. (Serious or complicated case involving one or more regions and/or organ systems)	50.0
90320 Initial care, COMPREHENSIVE history and physical examination, including initiation of diagnostic and treatment program and preparation of records. (A complex case involving an unusual amount of time, skill or judgment and an evaluation of the patient as a whole accompanied by a detailed report)	70.0

	Unit Value
90340 BRIEF examination, evaluation and/or treatment, same illness	12.0
90350 LIMITED examination, evaluation and/or treatment. (Routine followup care)	20.0
90360 INTERMEDIATE examination, evaluation and/or treatment. (Serious or complicated case involving one or more regions and/or organ systems)	30.0
90370 EXTENDED examination, evaluation and/or treatment requiring an unusual amount of time, skill or judgment but not necessitating a complete evaluation of the patient as a whole	40.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-21-026, filed 7/23/87; Order 76-34, § 296-21-026, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-21-026, filed 11/22/74, effective 4/1/75; Order 74-7, § 296-21-026, filed 1/30/74.]

WAC 296-21-027 Emergency room service. The following values apply for services performed in the emergency room when the physician is assigned to emergency room duty or is present in the emergency room because of other activity there, or if the physician elects to use the emergency room as a substitute for his office.

	Unit Value
INITIAL VISIT	
90500 MINIMAL service (i.e. injection, etc.)	10.0
90505 BRIEF evaluation, history, examination and/or treatment. (Not payable when other fees are payable except as indicated by modifiers)	20.0
90510 Initial LIMITED history and physical examination, including initiation of diagnostic and treatment program. (Routine case involving a single region and/or organ system) (Not payable when other fees are payable except as indicated by modifiers)	30.0
90515 Initial INTERMEDIATE history and physical examination, including initiation of diagnostic and treatment program and submission of a detailed report. (Serious or complicated case involving one or more regions and/or organ systems) (Not payable when other fees are payable except as indicated by modifiers).	50.0

	Unit Value
90517 Initial EXTENDED history and physical examination, including initiation of diagnostic and treatment program and submission of a detailed report in addition to the report of accident	60.0
90520 Initial COMPREHENSIVE history and physical examination, including initiation of diagnostic and treatment program and submission of a report in addition to the report of accident. A complex case requiring an unusual amount of time, skill or judgment and an evaluation of the patient as a whole and accompanied with a report	70.0
FOLLOW-UP VISIT	
90530 MINIMAL service (e.g., injection, minimal dressing, suture removal, minor laceration) (Not payable when other fees are applicable except as indicated by modifiers)	8.0
90540 BRIEF examination, evaluation and/or treatment. (Not payable when other fees are applicable except as indicated by modifiers)	12.0
90550 LIMITED examination, evaluation and/or treatment. (Routine follow up care) (Not payable when other fees are applicable except as indicated by modifiers)	16.0
90560 INTERMEDIATE examination, evaluation and/or treatment accompanied by a detailed report. (Case involving one or more regions and/or organ systems) (Not payable when other fees are payable except as indicated by modifiers)	20.0
90570 EXTENDED reexamination or reevaluation and/or treatment requiring an unusual amount of time, skill or judgment but not necessitating evaluation of the man as a whole accompanied by a detailed report. (Not payable when other fees are applicable except as indicated by modifiers)	30.0
90580 COMPREHENSIVE reexamination or reevaluation and/or treatment requiring complete reevaluation of the patient as a whole, accompanied by a detailed report	50.0

90590 Physician direction of emergency medical systems (EMS) emergency care, advanced life support, while located in a hospital emergency or critical care unit and is in two-way voice communication with rescue personnel outside the hospital	15.0
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[Statutory Authority: RCW 51.04.020(4) and 51.04.030, 87-16-004 (Order 87-18), § 296-21-027, filed 7/23/87; 86-06-032 (Order 86-19), § 296-21-027, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-21-027, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-21-027, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-21-027, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-21-027, filed 11/22/74, effective 4/1/75; Order 74-7, § 296-21-027, filed 1/30/74.]

WAC 296-21-030 Consultations. A CONSULTATION is considered here to include those services rendered by a physician whose OPINION OR ADVICE is requested by another physician or agency in the evaluation and/or treatment of a patient's illness. When the consultant physician thereupon assumes the CONTINUING CARE of the patient, any subsequent service(s) rendered by him will no longer be considered as a consultation. Five levels of consultation are recognized: Limited, intermediate, extensive, comprehensive, and complex consultation.

(For example)

(a) In a LIMITED consultation (90600) the physician confines his service to the examination or evaluation of a single organ system for a limited condition. This procedure includes documentation of the complaint(s), present illness, pertinent examination, review of medical data and establishment of a plan of management relating to the specific problem. For example, the dermatologist's opinion about a skin lesion.

(b) An INTERMEDIATE consultation (90605) involves examination or evaluation of an organ system, a partial review of the general history, recommendations for establishment of a plan of management relating to the specific problem and preparation of a report. An example would be the evaluation of abdomen for possible surgery that does not proceed to surgery, the neurologist's opinion about a disc problem and the orthopedist's opinion about a knee or low back problem.

(c) An EXTENDED/EXTENSIVE consultation (90610) involves the evaluation of problems that do not require a comprehensive evaluation of the patient as a whole. This procedure includes the documentation of a history of the chief complaint(s), past medical history and pertinent physical examination, review and evaluation of the past medical data, recommendations for establishment of a plan of investigative and/or therapeutic management, and the preparation of an appropriate report. For example: The examination of the cardiac patient who needs clearance before undergoing a surgical operation, consultations involving cardio-pulmonary problems and neurologic and orthopedic examinations of patient whose

complaints seem disproportionate to his objective findings requiring detailed psychosocial evaluation.

(d) A COMPREHENSIVE consultation (90620) involves an in depth evaluation of a patient with a problem requiring the development and documentation of medical data (the chief complaints, present illness, family history, past medical history, personal history, system review and physical examination, review of all diagnostic tests and procedures that have previously been done), recommendations for the establishment or verification of a plan for further investigative and/or therapeutic management and the preparation of a report. For example: The young person with fever, arthritis and anemia and examination of patient for diagnosis and in depth evaluation of all organ systems for preexisting and/or unrelated nonindustrial conditions; or a comprehensive psychiatric consultation that may include a detailed present illness history, and past history, a mental status examination, exchange of information with primary physician or nursing personnel or family members and other informants, and preparation of a report with recommendations.

(e) The COMPLEX consultation (90630) is an uncommonly performed service that involves an in depth evaluation of a critical problem that requires unusual knowledge, skill and judgment on the part of the consulting physician, and the preparation of an appropriate report with recommendations. An example would be acute myocardial infarction with major complications. Another example would be a young psychotic adult unresponsive to extensive treatment efforts under consideration for residential care, or the paraplegic patient with iatrogenic drug addiction or dependency (condition resulting from treatment).

A REFERRAL is considered here to be the transfer of the total or specific care of a patient from one physician to another. THIS IS NOT A CONSULTATION. Values for the initial visit and the subsequent services for referrals are listed under the appropriate headings in other portions of this schedule.

The values do not necessarily include consultations involving litigation.

	Unit Value
90600 Consultation requiring LIMITED examination and/or evaluation of a given system or region but not requiring a comprehensive history and examination. Report required.	30.0
90605 Intermediate consultation - Consultation requiring intermediate history and physical exam of one or more regions and/or organ system, but not requiring comprehensive history and examination. Requires report.....	40.0

	Unit Value
90610 Consultation requiring more EXTENSIVE examination and/or evaluation of one or more regions or organ systems but not requiring comprehensive history and examination. Report required.....	50.0
90620 Consultation requiring COMPREHENSIVE history, examination and/or evaluation of one or more regions and/or organ systems with report.	70.0
90630 Consultation of unusual complexity (in excess of scope of services identified by 90600, 90610 and 90620.) Necessitating exceptionally detailed history and examination with extensive review of prior medical records, completion and assessment of data and the preparation of a special report.	120.0

FOLLOW-UP CONSULTATION

90640 Follow-up consultation; brief	16.0
90641 limited	20.0
90642 intermediate	30.0
90643 complex	40.0

CONCURRING (CONFIRMATORY OR ADDITIONAL OPINION) CONSULTATION

This section should be used when the consulting physician is aware of the confirmatory nature of the opinion that is sought, e.g., when a second/third opinion on the necessity or appropriateness of a (previously) recommended medical treatment or surgical procedure is requested.

90650 Confirmatory consultation; limited	30.0
90651 intermediate	40.0
90652 extensive	50.0
90653 comprehensive	70.0
90654 complex	BR

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-21-030, filed 7/23/87; 86-06-032 (Order 86-19), § 296-21-030, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-21-030, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-21-030, filed 12/23/80, effective 3/1/81; Order 74-7, § 296-21-030, filed 1/30/74; Order 70-12, § 296-21-030, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-21-030, filed 11/27/68, effective 1/1/69.]

WAC 296-21-035 Independent medical examinations. Purpose:

Independent medical examinations may be requested by the department, the self-insurer, or the attending physician; this is usually for one of the following purposes:

- (1) To establish a diagnosis. Prior diagnoses may be controversial or ill-defined.
- (2) To outline a basis of rational treatment, where treatment or progress is controversial.

(3) To establish medical data to determine if the medical condition is industrially acquired, or unrelated to industrial work activities.

(4) To determine the extent and duration of aggravation of preexisting medical condition, by an industrial injury or exposure.

(5) To establish when the accepted medical condition has reached maximum benefit from treatment.

(6) To establish a percentage rating of any permanent disability, based on the loss of body function when maximum recovery is reached.

(7) To determine the indications for reopening of a claim for further treatment on basis of aggravation of accepted condition, based on objective findings.

Workers who are scheduled for independent medical examinations are allowed to bring with them an accompanying person to be present during the physical examination. The accompanying person cannot be compensated in any manner, except that language interpreters may be necessary for the communication process and may be reimbursed for interpretative services.

The department may designate those conditions under which the accompanying person is allowed to be present during the independent medical examination process.

An independent medical examination must be specific and factual if accurate and consistent judgment is to be maintained and the result give justice and uniformity.

The history should be checked for accuracy, variation or exaggeration. Physical findings should be detailed enough to be compatible with the history, diagnosis and conclusions.

Diagnoses: Must be specific and describe the pathology found and be substantiated by the history and physical findings. (Vague terminology only confuses.)

Conclusions: Must be specific and definitely express an opinion on the purpose for which the examination was requested. This should be rationalized with the history, physical findings and diagnosis. (Evasiveness, generalizations and omissions frequently render the report misleading or worthless for the intended purpose.)

Permanent disability: Ratings must be substantiated by sufficient objective findings and medical data to establish the percentage disability rating; also medical logic to demonstrate a definite causal relationship to the accepted industrial conditions on a more probable than not basis.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 88-14-012 (Order 88-09), § 296-21-035, filed 6/24/88; 87-16-004 (Order 87-18), § 296-21-035, filed 7/23/87; Order 74-7, § 296-21-035, filed 1/30/74; Order 68-7, § 296-21-035, filed 11/27/68, effective 1/1/69.]

WAC 296-21-040 Independent medical examinations single examiner.

Unit Value

Codes 90640, 90650 have been deleted. To report independent medical examinations by the attending physician or single special examiner (see 90678, 90679).

90678	Independent medical examination by a single physician (including examination by the attending physician) requiring the examination and/or evaluation involving loss of function and permanent impairment of a minor nature to a region and/or organ system and requiring a limited history and physical examination	100.0
90679	Independent medical examination by a single physician (including examination by the attending physician) requiring more extensive examination and/or evaluation involving considerable loss of function and permanent impairment to one or more regions and/or organ systems but not requiring a comprehensive history and physical examination	155.0
90694	Independent medical examination by a single physician (including examination by the attending physician) of unusual complexity in excess of scope of examination identified by 90678 and 90679 involving extensive loss of function and permanent impairment necessitating complete history and examination and extensive review of prior medical records, compilation and assessment of data and the preparation of an exceptionally detailed report.	225.0
90695	No show independent medical exam, one examiner scheduled	77.5
90696	Conference with department field representative relative to an individual case. (Each fifteen minutes)	16.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-21-040, filed 7/23/87; 86-06-032 (Order 86-19), § 296-21-040, filed 2/28/86, effective 4/1/86; Order 75-39, § 296-21-040, filed 11/28/75, effective 1/1/76; Order 74-7, § 296-21-040, filed 1/30/74; Order 68-7, § 296-21-040, filed 11/27/68, effective 1/1/69.]

WAC 296-21-045 Independent medical examinations two or more examiners.

	Unit Value
(90660, 90670 have been deleted. To report see 90675, 90676, 90677.)	
90671 No show, two examiners scheduled	155.0
90672 No show, extra examiner scheduled; each examiner	77.5
90673 No show, three examiners scheduled	232.5
90674 No show, NOP (neurologist, orthopedist, psychiatrist)	310.0
90675 Independent medical examination with two examiners, not including a psychiatrist, requiring examination and/or evaluation involving considerable loss of function and permanent impairment requiring an extremely comprehensive history and physical examination	310.0
90676 Independent medical examination by three examiners, not including a psychiatrist, involving extensive loss of function and permanent impairment necessitating complete history and examination and extensive review of prior medical records, compilation and assessment of data, and the preparation of an exceptionally detailed report	465.0
90677 Independent medical examination by three examiners including a psychiatrist, involving extensive loss of function and permanent impairment necessitating complete history and physical examination and extensive review of prior medical records, compilation and assessment of data, and the preparation of an exceptionally detailed report	620.0
(90690 has been deleted. This service is included in 90675-90679.)	
90680 In complicated or controversial cases where voluminous hard copies of departmental files must be reviewed in connection with an independent medical examination within the scope of examinations identified by 90675, 90676, 90677, 90678, and 90679 an additional fee will be allowed at the discretion of the department	40.0
90681 Additional examiner, not a psychiatrist	155.0

90683 Review of microfiche file on request of department in connection with an independent medical examination. File of less than eight pages	40.0
90684 Review of microfiche file on request of department in connection with an independent medical examination. File of eight pages or more. Each additional page	2.5
90685 Addendum report requested by department or self-insurer for information not requested in original assignment and which necessitates review of records and exam notes	40.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-21-045, filed 7/23/87; 86-06-032 (Order 86-19), § 296-21-045, filed 2/28/86, effective 4/1/86; Order 76-34, § 296-21-045, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-21-045, filed 11/28/75, effective 1/1/76; Order 74-7, § 296-21-045, filed 1/30/74; Order 71-6, § 296-21-045, filed 6/1/71; Order 68-7, § 296-21-045, filed 11/27/68, effective 1/1/69.]

WAC 296-21-046 Immunization injections.

(For allergy testing, see 95000 et seq.)

(For skin testing of bacterial, viral, fungal extracts, see 86450-86585)

(For therapeutic injections, see 90782-90799)

Immunizations are usually given in conjunction with a medical service. When an immunization is the only service performed, a minimal service may be listed in addition to the injection. Immunization procedures include the supply of materials. Immunizations, except for 90703, require prior authorization.

(Immunization 90720-90723 have been revised as 90701-90742)

	Unit Value
90701 Immunization, active; diphtheria and tetanus toxoids and pertussis vaccine (DTP)	8.0
90702 diphtheria and tetanus toxoids (DT)	5.0
90703 tetanus toxoid	6.0
90704 mumps virus vaccine, live	BR
90705 measles virus vaccine, live, attenuated	BR
90706 rubella virus vaccine, live	BR
90707 measles, mumps and rubella virus vaccine, live	BR
90708 measles and rubella virus vaccine, live	13.0
90709 rubella and mumps virus vaccine, live	BR

	Unit Value
90712	polio virus vaccine, live, oral (any type(s)) BR
90713	poliomyelitis vaccine BR
90714	typhoid vaccine BR
90717	yellow fever vaccine BR
90718	tetanus and diphtheria toxoids absorbed, for adult use (Td) 5.0
90719	diphtheria toxoid BR
90724	influenza virus vaccine 6.0
90725	cholera vaccine BR
90726	rabies vaccine 4.0
90727	plague vaccine BR
90728	BCG vaccine BR
90731	hepatitis B vaccine BR
90732	pneumococcal vaccine, polyvalent BR
90733	meningococcal polysaccharide vaccine (any group(s)) BR
90737	Hemophilus influenza B 6.0
90741	Immunization, passive; immune serum globulin, human (ISG) BR
90742	specific hyperimmune serum globulin (e.g., hepatitis B, measles, pertussis, rabies, Rho(D), tetanus, vaccinia, varicella-zoster) BR
90749	Unlisted immunization procedure BR

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-21-046, filed 7/23/87; 86-06-032 (Order 86-19), § 296-21-046, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-21-046, filed 8/2/83.]

WAC 296-21-057 Monitoring services. The following values are for physician's services only and do not include charges for use of equipment or supplies.

	Unit Value
Dialysis	
HEMODIALYSIS	
(For cannula declotting, see 36860, 36861)	
90941	Hemodialysis, acute renal failure or intoxication, per dialysis BR+
90942	patient 21-40 kg BR
90943	patient 11-20 kg BR
90944	patient under 10 kg BR
90951	Hemodialysis, for chronic irreversible renal insufficiency, initial stabilizing therapy via shunt or fistula, up to 4-6 weeks; patient over 40 kg BR
90952	patient 21-40 kg BR
90953	patient 11-20 kg BR

90954	patient under 10 kg BR
90955	Hemodialysis, for chronic irreversible renal insufficiency, maintenance for stabilized condition, more than 4-6 weeks, hospital, patient over 40 kg BR
90956	patient 21-40 kg BR
90957	patient 11-20 kg BR
90958	patient under 10 kg BR
PERITONEAL DIALYSIS	
(For insertion of cannula or catheter, see 49420, 49421)	
90966	Peritoneal dialysis for acute renal failure and/or intoxication, excluding catheter/cannula insertion; patient more than 40 kg BR
90967	patient 21-40 kg BR
90968	patient 11-20 kg BR
90969	patient under 10 kg BR
90976	Peritoneal dialysis for chronic renal failure; patient more than 40 kg BR
90977	patient 21-40 kg BR
90978	patient 11-20 kg BR
90979	patient under 10 kg BR

MISCELLANEOUS DIALYSIS PROCEDURES

90990	Hemodialysis training and/or counseling BR
90991	Home hemodialysis care, outpatient, for those services either provided by the physician primarily responsible for total hemolysis care or under his direct supervision, and excludes care for complicating illnesses unrelated to hemodialysis BR
90997	Hemoperfusion (e.g., with activated charcoal or resin) BR
90999	Unlisted dialysis procedure BR

(For cannula insertion by other than treating physician, see 49420)

GASTROENTEROLOGY

(For duodenal intubation and aspiration, see 89100-89105)

(For gastrointestinal radiologic procedures, see 74210-74340)

	Unit Value
91000 Esophageal intubation and collection of washings for cytology, including preparation of specimens (separate procedure).....	36.0
91010 Esophageal motility study;	106.0
91011 with mecholyl or similar stimulant	130.0
91012 with acid perfusion studies	72.0
91020 Esophagogastric manometric studies	BR
91030 Esophagus, acid perfusion (Bernstein) test for esophagitis	36.0
91032 Esophagus, acid reflux test, with intraluminal pH electrode for detection of gastroesophageal reflux	72.0
91033 prolonged recording	BR
91052 Gastric analysis test with injection of stimulant of gastric secretion (e.g., histamine, insulin, pentagastrin, calcium, and secretin)	BR
(For gastric biopsy by capsule, peroral, via tube, one or more specimens, see 43600)	
(For gastric laboratory procedures, see also 89130-89141)	
91055 Gastric intubation, washings, and preparing slides for cytology (separate procedure).....	36.0
(For gastric lavage, therapeutic, see 99170)	
91060 Gastric saline load test	30.0
(For biopsy by capsule, small intestine, per oral, via tube (one or more specimens), see 44100)	
91090 Gastrointestinal string test for upper gastrointestinal bleeding with or without fluorescein	30.0
91100 Intestinal bleeding tube, passage, positioning and monitoring	BR
(For injection procedure for percutaneous transhepatic cholangiography, see 47500)	
(For cholangiography, see 74320, 74321)	

	(For abdominal paracentesis, see 49080, 49081; with instillation of medication, see 90793)
	(For peritoneoscopy, see 49300; with biopsy, see 49301)
	(For peritoneoscopy and guided transhepatic cholangiography, see 49302; with biopsy, see 49303)
	(For injection procedure for splenoportography, see 38200)
91122 Anorectal manometry	BR
91299 Unlisted diagnostic gastroenterology procedure	BR
[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-21-057, filed 7/23/87; 83-16-066 (Order 83-23), § 296-21-057, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-21-057, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-21-057, filed 12/23/80, effective 3/1/81; Order 74-7, § 296-21-057, filed 1/30/74.]	

WAC 296-21-066 Cardiovascular. Values for items 92950-93799 include laboratory procedure(s), interpretation and physician's services (except surgical and anesthesia services as listed in the section on surgery), unless otherwise stated.

	Unit Value	Basic Anes@
THERAPEUTIC SERVICES		
92950 Cardiopulmonary resuscitation (e.g., in cardiac arrest)	SV	
(See also critical care services, 99160)		
92960 Cardioversion, elective, electrical conversion of arrhythmia, external	100.0	4.0
92970 Cardioassist-method of circulatory assist; internal	BR	
92971 external	BR	
(For balloon atrial-septostomy, see 33738)		
(For placement of catheters for use in circulatory assist devices such as intra-aortic balloon pumping, see 33970)		
92975 Thrombolysis, coronary; by intracoronary infusion, including selective, coronary angiography	BR	

Medical Fees

296-21-066

	Unit Value	Basic Anes@		Unit Value	Basic Anes@
CARDIAC FLUOROSCOPY			(For subsequent monitoring, see 99150, 99151)		
93280 Cardiac fluoroscopy	BR		93505 Endomyocardial biopsy	200.0	5.0
(For chest fluoroscopy, see 71034, 76000)			93510 Left heart catheterization, retrograde, from the brachial artery, axillary artery or femoral artery; percutaneous	200.0	5.0
ECHOCARDIOGRAPHY			93511 by cutdown	200.0	5.0
93300 Echocardiography, M-Mode; complete	90.7		93514 by left ventricular puncture	200.0	5.0
93305 limited (e.g., follow-up or limited study)	BR		93524 Combined transseptal and retrograde left heart catheterization	400.0	5.0
93307 Echocardiography, real-time scan; complete	80.5		93526 Combined right heart catheterization and retrograde left heart catheterization	450.0	5.0
93308 limited	BR		93527 Combined right heart catheterization and transseptal left heart catheterization (with or without retrograde left heart catheterization)	400.0	5.0
93309 Echocardiography, M-mode and real time with image documentation	190.7		93528 Combined right heart catheterization with left ventricular puncture (with or without retrograde left heart catheterization)	400.0	5.0
93320 Doppler echocardiography	BR		93536 Percutaneous insertion of intra-aortic balloon catheter	BR	
(Procedure 93320 is often performed in combination with M-Mode or 2-dimensional echocardiography)					
(For echocardiography as a radiologic procedure, see 76620-76628)					
Cardiac catheterization			(For removal of balloon catheter, see 33971)		
Cardiac catheterization procedure includes placement of catheter(s), recording of intracardiac and intravascular pressure, obtaining blood samples for measurement of blood gases and/or dye (or other) dilution curves and cardiac output measurements (dye dilution, Fick or other method, with or without rest and exercise and/or other studies) with or without electrode catheter placement, final evaluation and report.			Injection procedures performed in conjunction with cardiac catheterization. These include placement or repositioning of catheters and use of automatic power injectors. The technical details of angiography, supervision of filming and processing, interpretation and report are not included. For radiological services, see appropriate section.		
(For radiological procedures, see 75500-75755)					
Listed values are for the physician's services only and include usual preassessment of cardiac problem and recording of intra-cardiac pressure.					
(For consultation services, see 90600-90630)			93541 Injection procedure during cardiac catheterization; for pulmonary angiography	290.0	
93501 Right heart catheterization; only	350.0	5.0	93542 for selective right ventricular or right atrial angiography	290.0	
(For bundle of His recording, see 93600)			93543 for selective left ventricular or left atrial angiography	290.0	
93503 Placement of flow directed catheter (e.g., Swan-Ganz), with or without balloon tip, when placed for monitoring purposes, collection of blood, and/or angiography	200.0	5.0	(For radiological procedures, see 75500-75509)		
			93544 for aortography	290.0	
			(For radiological procedures, see 75600-75628)		

	Unit Value	Basic Anes@		Unit Value	Basic Anes@
93545			93561		
for selective coronary angiography (injection of radiopaque material may be by hand)	290.0		Indicator dilution studies such as dye or thermal dilution, including arterial and/or venous catheterization; with cardiac output measurement (separate procedure)	50.0	
(For radiological procedures, see 75750-75755)			93562		
93546			subsequent measurement of cardiac output	20.0	
Combined left heart catheterization and left ventricular angiography	290.0		(For unlisted cardiac catheterization procedure, see 93799)		
93547			INTRACARDIAC ELECTROPHYSIOLOGICAL PROCEDURES		
Combined left heart catheterization, selective coronary angiography and selective left ventricular angiography (this code number is to be used when procedure 93510 is combined with procedures 93543 and 93545)	350.0		93600		
93548			Bundle of His recording	200.0	
Combined left heart catheterization, selective coronary angiography, selective left ventriculography, and aortic root aortography	300.0		93602		BR
93549			93603		BR
Combined right and left heart catheterization, selective coronary angiography, and selective left ventricular angiography (this code number is to be used when procedure 93547 is combined with right heart catheterization)	400.0		93605		BR
93550			with mapping	BR	
with selective visualization of bypass graft (this code number is to be used when procedure 93549 is combined with procedure 93551)	BR		93607		BR
93551			Left ventricular recording	BR	
Selective opacification of aortocoronary bypass grafts (injection of radiopaque material may be made by hand)	BR		93608		BR
93552			with mapping	BR	
Combined left heart catheterization, selective coronary angiography, selective left ventricular cineangiography and visualization of bypass grafts; (this code number is to be used when procedure 93550 is combined with procedure 93547)	BR		93610		BR
93553			Intra-atrial pacing	BR	
with aortic root aortography (this code number is to be used when procedure 93548 is combined with procedure 93550)	BR		93612		BR
(For radiographic procedures, see 75741-75748)			Intraventricular pacing	BR	
			93614		BR
			Bundle of His pacing	BR	
			93618		BR
			Induction of arrhythmia by electrical pacing	BR	
			(For intracardiac phonocardiogram, see 93210)		
			93630		BR
			Left ventricular endocardial resection, with or without cryoablation, with intra-operative mapping	BR	
			Other vascular studies		
			(For arterial cannulization and recording of direct arterial pressure, see 36620)		
			(For radiographic injection procedures, see 36000-36299)		
			(For vascular cannulization for hemodialysis, see 36800-36820)		
			(For chemotherapy for malignant disease, see 90790-90796)		
			(For penile plethysmography, see 54240)		
			(93700 Peripheral vascular disease studies has been deleted. To report, see 93850-93960)		
			(93710 carotid phonoangiography has been deleted. To report, use 93860)		

	Unit Value	Basic Anes@	(For skin testing of bacterial, viral, fungal extracts, etc., see 86450-86585)
analysis, flow velocity signals)	114.4		
93910 Noninvasive studies of lower extremity arteries (e.g., segmental blood pressure measurements, continuous wave Doppler analog wave form analysis, evocative pressure response to exercise or reactive hyperemia, photoplethysmography or pulse volume digit wave form analysis, flow velocity signals)	80.0		
VENOUS STUDIES			
93950 Noninvasive studies of extremity veins (e.g., Doppler studies with evaluation of venous flow patterns and responses to compression and other maneuvers, phleborheography, impedance plethysmography)	76.3		
[Statutory Authority: RCW 51.04.020(4) and 51.04.030, 87-16-004 (Order 87-18), § 296-21-066, filed 7/23/87; 86-06-032 (Order 86-19), § 296-21-066, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-21-066, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3), 81-01-100 (Order 80-29), § 296-21-066, filed 12/23/80, effective 3/1/81; Order 74-7, § 296-21-066, filed 1/30/74. Formerly WAC 296-21-060 (part).]			
WAC 296-21-075 Allergy and clinical immunology.			
NOTES			
ALLERGY SENSITIVITY TESTS: Allergy testing and treatment require prior authorization. The performance and evaluation of selective cutaneous and mucous membrane tests in correlation with the history, physical examination, and other observations of the patient. The number of tests performed should be judicious and dependent upon the history, physical findings, and clinical judgment. All patients should not necessarily receive the same tests nor the same number of sensitivity tests.			
IMMUNOTHERAPY (DESENSITIZATION, HYPOSENSITIZATION): The parenteral administration of allergenic extracts as antigens at periodic intervals, usually on an increasing dosage scale to a dosage which is maintained as maintenance therapy. Indications for immunotherapy are determined by appropriate diagnostic procedures coordinated with clinical judgment and knowledge of the natural history of allergic diseases.			
OTHER THERAPY: For medical conferences on the use of mechanical and electronic devices (precipitators, air conditioners, air filters, humidifiers, dehumidifiers), climatotherapy, physical therapy, occupational and recreational therapy, see 95105.			
(For definitions of LEVELS OF SERVICE, see the Introduction)			
(For medical service procedures, see 90000-90699)			
(For pulmonary function tests, see 94060, 94070)			
SPECIAL DIAGNOSTIC PROCEDURES (ALLERGY TESTING)			
			Unit Value
95000 Percutaneous tests (scratch, puncture, prick) with allergenic extracts; up to 30 tests			10.0
95001 31-60 tests each test			1.0
95002 61-90 tests each test			1.5
95003 more than 90 tests each test			2.0
95005 Percutaneous tests (scratch, puncture, prick) with antibiotics, biologicals, stinging insects; 1-5 tests			10.0
95006 6-10 tests each test			1.0
95007 11-15 tests each test			1.5
95011 more than 15 tests each test			2.0
95014 Intracutaneous (intradermal) tests, with antibiotics, biologicals, stinging insects, immediate reaction 15-20 minutes; 1-5 tests			15.0
95016 6-10 tests each test			2.0
95017 11-15 tests each test			2.5
95018 more than 15 tests each test			3.0
95020 Intracutaneous (interdermal) tests with allergenic extracts, immediate reaction—15 to 20 minutes; up to 10 tests			15.0
95022 21-30 tests each test			2.0
95023 more than 30 tests each test			2.5
95027 Skin end point titration			BR
95030 Intracutaneous (intradermal) tests with allergenic extracts, delayed reaction—24 to 72 hours, including reading; 2 tests			20.0
95031 3-4 tests each test			2.0
95032 5-6 tests each test			2.5
95033 7-8 tests each test			3.0
95034 more than 8 tests each test			3.5
95040 Patch test, one to ten tests			10.0
95041 11-20 tests each test			2.0
95042 21-30 tests each test			2.5
95043 more than 30 tests each test			3.0
95050 Photo-patch test, one to ten tests			10.0
95051 more than 10 tests each test			4.0
95056 Photo test			10.0
95060 Mucous membrane test ophthalmic			10.0
95065 Direct nasal mucous membrane test			10.0
95070 Inhalation bronchial challenge testing (not including necessary pulmonary function tests); with histamine, methacholine, or similar compounds			BR
95071 with antigens, specify			BR

	Unit Value
95075 Ingestion challenge test (e.g., metabisulfite)	BR
95077 Food allergenic extract immunotherapy	BR
95078 Provocative testing (e.g., Rinkel test)	BR
95080 Passive transfer test one to ten tests	100.0
95081 11-20 tests each test	2.0
95082 more than 20 tests each test	3.0
(For allergy laboratory tests, see 86000-86699)	
(For intravenous therapy for severe or intractable allergic disease, see 90799)	
(For preparation of antigens, materials supplied by physician, etc., see 99070)	
95105 Medical conference services (e.g., use of mechanical and electronic devices, climatotherapy, breathing exercises and/or postural drainage)	50.0
(For summary conference or for therapeutic conference by physician following completion of diagnostic workup, including discussion, avoidance, elimination, symptomatic treatment, and immunotherapy, see 90040-90070)	
(For prolonged conference, see 99155-99156)	
ALLERGY IMMUNOTHERAPY	
95120 Immunotherapy, in prescribing physician's office or institution, including provision of allergenic extract; single antigen	20.0
95125 multiple antigens (specify number of injections)	30.0
95130 single stinging insect venom	20.0
95131 two stinging insect venoms	BR
95132 three stinging insect venoms	BR
95133 four stinging insect venoms	BR
95134 five stinging insect venoms	BR
95135 Professional services performed in the supervision and provision of antigens for allergen immunotherapy (specify number of vials); single antigen, single dose vial	20.0
95140 multiple antigens, single dose vials	30.0
95145 single stinging insect venom, single dose vials	20.0
95146 two single stinging insect venoms, single dose vials	BR
95150 Professional services performed in the supervision and provision of antigens for allergen immunotherapy (specify number of treatments or total volume); single antigen, multiple dose vials	25.0

95155 multiple antigens, multiple dose vials	35.0
95160 stinging insect venom, multiple dose vials	35.0
(For allergy injection(s) by other than the prescribing physician, see 90782)	
95180 Rapid desensitization procedure, each hour (e.g., insulin, penicillin, horse serum)	BR
95199 Unlisted allergy/clinical immunologic service or procedure	BR

(For skin testing of bacterial, viral, fungal extracts, see 95030-95034, 86450-86585)

(For special reports on allergy patients, see 99080)

(For testing procedures such as radioallergosorbent testing (RAST), rat mast cell technique (RMCT), mast cell degranulation test (MDT), lymphocytic transformation test (LTT), leukocyte histamine release (LHR), migration inhibitory factor test (MIF), transfer factor test (TFT), nitroblue tetrazolium dye test (NTD), see Immunology section in Pathology or use 95199)

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-21-075, filed 7/23/87; 86-06-032 (Order 86-19), § 296-21-075, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-21-075, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-21-075, filed 12/23/80, effective 3/1/81; Order 74-7, § 296-21-075, filed 1/30/74; Order 68-7, § 296-21-075, filed 11/27/68, effective 1/1/69.]

WAC 296-21-128 Special services and billing procedures--Anesthesia. Many anesthesia services are provided under particularly difficult circumstances depending on factors such as extraordinary condition of patient, notable operative conditions, unusual risk factors. This section includes a list of important qualifying circumstances that significantly impact on the character of the anesthetic service provided. These procedures would not be reported alone but would be reported as additional procedure numbers qualifying an anesthesia procedure or service.

	Unit Value
QUALIFYING CIRCUMSTANCES: (More than one may be selected.)	
99100 Anesthesia for patient of extreme age, under one year and over seventy	BR
99110 Anesthesia complicated by prone position and/or intubation to avoid surgical field	1.0
99116 Anesthesia complicated by utilization of total body hypothermia	10.0

	Unit Value
99125 Anesthesia complicated by extra-corporeal circulation, e.g., heart pump oxygenator bypass or pump assist, with or without hypothermia	10.0
99130 Anesthesia complicated by hyperbaric or compression chamber pressurization	BR
99135 Anesthesia complicated by utilization of controlled hypotension.	BR
99140 Anesthesia complicated by emergency conditions (specify) (An emergency is defined as existing when delay in treatment of the patient would lead to a significant increase in the threat to life or body part.)	2.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 88-04-052 (Order 87-29), § 296-21-128, filed 1/29/88; 86-06-032 (Order 86-19), § 296-21-128, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-21-128, filed 11/30/81, effective 1/1/82; Order 74-7, § 296-21-128, filed 1/30/74.]

**Chapter 296-22 WAC
SURGICAL FEES**

WAC

SURGERY

296-22-010	General information and instructions.
	INTEGUMENTARY SYSTEM
296-22-021	Excision—Debridement.
296-22-022	Introduction.
296-22-023	Repair.
296-22-024	Repair—Complex.
296-22-025	Free skin grafts.
296-22-031	Breast.
	MUSCULOSKELETAL SYSTEM
296-22-036	General.
296-22-038	Introduction or removal.
296-22-039	Reimplantation.
296-22-042	Head.
296-22-051	Neck (soft tissues) and thorax.
296-22-053	Spine (vertebral column).
296-22-061	Abdomen.
296-22-063	Shoulder.
296-22-067	Humerus (upper arm) and elbow.
296-22-071	Forearm and wrist.
296-22-073	Hand and fingers.
296-22-079	Pelvis and hip joint.
296-22-082	Femur (thigh region) and knee joint.
296-22-087	Leg (tibia and fibula) and ankle joint.
296-22-091	Foot.
296-22-097	Arthroscopy.
	RESPIRATORY SYSTEM
296-22-100	Nose respiratory system.
296-22-115	Trachea and bronchi.
296-22-116	Lungs and pleura.
	CARDIOVASCULAR SYSTEM
296-22-120	Heart and pericardium.
296-22-125	Arteries and veins.

HEMIC AND LYMPHATIC SYSTEMS

296-22-130	Spleen.
296-22-135	Lymph nodes and lymphatic channels.

MEDIASTINUM AND DIAPHRAGM

296-22-140	Mediastinum.
296-22-141	Diaphragm.

DIGESTIVE SYSTEM

296-22-146	Lips.
296-22-147	Vestibule of mouth.
296-22-150	Tongue, floor of mouth.

DENTOALVEOLAR STRUCTURES

296-22-160	Palate, uvula.
296-22-165	Salivary glands and ducts.
296-22-180	Esophagus.
296-22-190	Stomach.
296-22-195	Intestines (except rectum).
296-22-210	Rectum.
296-22-215	Anus.
296-22-220	Liver.
296-22-225	Biliary tract.
296-22-230	Pancreas.
296-22-235	Abdomen, peritoneum and omentum.

URINARY SYSTEM

296-22-245	Kidney.
296-22-250	Ureter.
296-22-255	Bladder.
296-22-260	Urethra.

MALE GENITAL SYSTEM

296-22-265	Penis.
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FEMALE GENITAL SYSTEM

296-22-310	Vulva and introitus.
296-22-315	Vagina.
296-22-330	Corpus uteri.
296-22-337	Ovary.

MATERNITY CARE AND DELIVERY

296-22-340	Maternity care and delivery.
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ENDOCRINE SYSTEM

296-22-350	Thyroid gland.
296-22-355	Parathyroid, thymus, adrenal glands and carotid body.

NERVOUS SYSTEM

296-22-365	Skull, meninges, and brain.
296-22-370	Spine and spinal cord.
296-22-375	Extracranial nerves, peripheral nerves and autonomic nervous system.

EYE AND OCULAR ADNEXA

296-22-405	Eyeball.
296-22-410	Anterior segment—Cornea.
296-22-425	Anterior segment—Lens.
296-22-427	Posterior segment—Vitreous.
296-22-430	Posterior segment—Retinal detachment.
296-22-445	Ocular adnexa—Eyelids.

AUDITORY SYSTEM

296-22-475	Inner ear.
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SURGERY

WAC 296-22-010 General information and instructions. Rules and billing procedures pertaining to all practitioners rendering services to injured workers are presented in the general information section beginning with WAC 296-20-010. Some commonalities are repeated here for the convenience of those doctors referring to the surgery section. Definitions and rules unique

	Unit Value
99125 Anesthesia complicated by extra-corporeal circulation, e.g., heart pump oxygenator bypass or pump assist, with or without hypothermia	10.0
99130 Anesthesia complicated by hyperbaric or compression chamber pressurization	BR
99135 Anesthesia complicated by utilization of controlled hypotension.	BR
99140 Anesthesia complicated by emergency conditions (specify) (An emergency is defined as existing when delay in treatment of the patient would lead to a significant increase in the threat to life or body part.)	2.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 88-04-052 (Order 87-29), § 296-21-128, filed 1/29/88; 86-06-032 (Order 86-19), § 296-21-128, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-21-128, filed 11/30/81, effective 1/1/82; Order 74-7, § 296-21-128, filed 1/30/74.]

**Chapter 296-22 WAC
SURGICAL FEES**

WAC

SURGERY

296-22-010	General information and instructions.
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296-22-021	Excision—Debridement.
296-22-022	Introduction.
296-22-023	Repair.
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296-22-025	Free skin grafts.
296-22-031	Breast.
MUSCULOSKELETAL SYSTEM	
296-22-036	General.
296-22-038	Introduction or removal.
296-22-039	Reimplantation.
296-22-042	Head.
296-22-051	Neck (soft tissues) and thorax.
296-22-053	Spine (vertebral column).
296-22-061	Abdomen.
296-22-063	Shoulder.
296-22-067	Humerus (upper arm) and elbow.
296-22-071	Forearm and wrist.
296-22-073	Hand and fingers.
296-22-079	Pelvis and hip joint.
296-22-082	Femur (thigh region) and knee joint.
296-22-087	Leg (tibia and fibula) and ankle joint.
296-22-091	Foot.
296-22-097	Arthroscopy.
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296-22-210	Rectum.
296-22-215	Anus.
296-22-220	Liver.
296-22-225	Biliary tract.
296-22-230	Pancreas.
296-22-235	Abdomen, peritoneum and omentum.

URINARY SYSTEM

296-22-245	Kidney.
296-22-250	Ureter.
296-22-255	Bladder.
296-22-260	Urethra.

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296-22-330	Corpus uteri.
296-22-337	Ovary.

MATERNITY CARE AND DELIVERY

296-22-340	Maternity care and delivery.
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296-22-365	Skull, meninges, and brain.
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AUDITORY SYSTEM

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SURGERY

WAC 296-22-010 General information and instructions. Rules and billing procedures pertaining to all practitioners rendering services to injured workers are presented in the general information section beginning with WAC 296-20-010. Some commonalities are repeated here for the convenience of those doctors referring to the surgery section. Definitions and rules unique

to surgery are also included here. *Doctor's services* rendered for office, home, hospital, consultations and other services are listed in the medicine section. The department may designate those diagnostic and surgical procedures which can be performed in other than a hospital inpatient setting. Where a worker has a medical condition which necessitates a hospital admission, prior approval of the department or self-insurer must be obtained.

(1) Listed values for all surgical procedures include the surgery, local infiltration, digital block or topical anesthesia when used and the normal uncomplicated follow-up care for the period indicated in days in the column headed "follow-up days."

(2) Follow-up care for diagnostic procedures (e.g., endoscopy, injection procedures for radiography, etc.) includes only that care related to recovery from the diagnostic procedure itself. Care of the condition for which the diagnostic procedure was performed or other concomitant conditions is not included and may be charged for in accordance with the services rendered.

(3) Follow-up care for therapeutic surgical procedures includes only that care usually a part of the surgical service. Complications, exacerbations, recurrence or the presence of other diseases or injuries requiring additional services concurrent with the procedure(s) or during the listed period of normal follow-up care may warrant additional charges. (See modifier -68.)

When an additional surgical procedure(s) is carried out within the listed period of follow-up care for a previous surgery, the follow-up periods will continue concurrently to their normal terminations.

(4) **PREOPERATIVE VISITS AND SERVICES:** Under most circumstances the immediate preoperative visit in the hospital or elsewhere necessary to examine the patient, complete the hospital records, and initiate the treatment program is included in the listed value for the surgical procedure.

Additional charges may be warranted for preoperative services under the following circumstances:

(a) When the preoperative visit is the initial visit (e.g., an emergency, etc.) and prolonged detention or evaluation is required to prepare the patient or to establish the need for and type of surgical procedure.

(b) When the preoperative visit is a consultation as defined in WAC 296-21-030.

(c) When procedures not usually part of the basic surgical procedure (e.g., bronchoscopy prior to chest surgery, etc.) are provided during the immediate preoperative period.

(5) **CONCURRENT SERVICES BY MORE THAN ONE PHYSICIAN:** Charges for concurrent services of two or more physicians may be warranted under the following circumstances:

(a) Medical services provided during the surgical procedure or in the postoperative period (e.g., diabetic management, operative monitoring of cardiac or brain conditions, management of postoperative electrolyte imbalance, etc.).

(b) **TWO SURGEONS:** Under certain circumstances the skills of two surgeons (e.g., a urologist and a general

surgeon in the creation of an ileal conduit, etc.). By prior agreement, the total value may be apportioned in relation to the responsibility of work done. The total value may be increased by 25% in lieu of the assistant's charge. (See modifier -62.)

(c) **CO-SURGEONS:** Under certain circumstances, two surgeons (usually with similar skills) may function simultaneously as primary surgeons performing distinct parts of a total surgical service (e.g., two surgeons simultaneously applying skin grafts to different parts of the body of the same patient). By prior agreement, the total value may be apportioned in relation to the responsibility and work done. The total value may be increased by an appropriate amount in lieu of the usual assistant's charge. (See modifier -64.)

(d) **SURGICAL TEAM:** Under some circumstances highly complex procedures requiring the concomitant services of several physicians, often of different specialties, plus other highly skilled, specially trained personnel and various types of complex equipment are carried out under the surgical team concept with a single, global fee for the total service. The services included in the "global" charge vary widely and no single value can be listed. The value should be supported by a report to include itemization of the physician(s) services, paramedical personnel and equipment included in the "global" charge. (See modifier -66.)

(6) **ASTERISK (*) PROCEDURES OR ITEMS:** Certain relatively small surgical services involve a readily identifiable surgical procedure but include variable preoperative and postoperative services (e.g., incision and drainage of an abscess, injection of a tendon sheath, manipulation of a joint under anesthesia, dilation of the urethra, etc.). Because of the indefinite pre and postoperative services the usual "package" concept for surgical services (see above) cannot be applied. Such procedures are identified by an asterisk (*) preceding or following the procedure code number.

Where an asterisk (*) precedes or follows a procedure number and its value, the following rules apply:

(a) The services as listed includes the surgical procedure only. Associated pre and postoperative services are not included.

(b) Preoperative services are considered as one of the following:

(i) When the asterisk (*) procedure is carried out at the time of an initial visit (new patient) and this procedure constitutes the major service at that visit, procedure number 99025 is listed in lieu of the usual initial visit as an additional service.

(ii) When the asterisk (*) procedure is carried out at the time of an initial or other visit involving significant identifiable services (e.g., removal of a small skin lesion at the time of a comprehensive history and physical examination), the appropriate visit is listed in addition to the asterisk (*) procedure and its follow-up care.

(iii) When the asterisk (*) procedure is carried out at the time of a follow-up (established patient) visit and this procedure constitutes the major service at that visit, no visit service is usually added.

(iv) When the asterisk (*) procedure requires hospitalization, an appropriate hospital visit is listed in addition to the asterisk (*) procedure and its follow-up care.

(c) All postoperative care is to be added on a service-by-service basis (e.g., office or hospital visit, cast change, etc.).

(d) Complications are added on a service-by-service basis (as with all surgical procedures).

(7) MULTIPLE OR BILATERAL SURGICAL PROCEDURES:

(a) When multiple surgical procedures which add significant time or complexity to patient care are performed at the same operative session. (See modifier -51.)

(b) When bilateral surgical procedures which add significant time or complexity to patient care are performed at the same operative session. (See modifier -50.)

(c) Incidental procedures (e.g., incidental appendectomy, incidental scar incision, puncture of ovarian cysts, simple lysis of adhesions, simple repair of hiatal hernia, etc.) do not warrant an additional charge. (See modifier -52.) THESE PROCEDURES MUST BE AUTHORIZED IN ADVANCE.

(8) SURGERY AND FOLLOW-UP CARE PROVIDED BY DIFFERENT PHYSICIANS: When one physician performs the surgical procedure itself and another provides the follow-up care, the value may be apportioned between them by agreement along with notification to the department of the fee distribution. (See modifier -54 or -55.)

(9) ANESTHESIA BY SURGEON: When regional or general anesthesia is provided by the surgeon, value as "basic" value for anesthesia procedure without added value for time. (See modifier -47) (For local infiltration, digital block or topical anesthesia, see WAC 296-22-010, item 1.)

(10) In cases where the claimant does not survive, the percentage of the flat fee paid the physician shall be commensurate with the services rendered.

(11) The emergency room will be considered the office for those physicians providing regular emergency room care to the hospital and fees will be allowed on this basis.

(12) Materials supplied by physician: Supplies and materials provided by the physician, e.g., sterile trays/drugs, over and above those usually included with the office visit or other services rendered may be listed separately. List drugs, trays, supplies, and materials provided. Identify as 99070.

(13) Separate or multiple procedures: It is appropriate to designate multiple procedures that are rendered on the same date by separate entries. (See modifier -50 below.)

(14) Special report: A service that is rarely provided, unusual, variable, or new may require a special report in determining medical appropriateness of the service. Pertinent information should include an adequate definition or description of the nature, extent, and need for the procedure, and the time, effort, and equipment necessary to provide the service. Additional items which may be included are: Complexity of symptoms, final diagnosis,

pertinent physical findings (such as size, location, and number of lesion(s), if appropriate), diagnostic and therapeutic procedures (including major and supplementary surgical procedures, if appropriate), concurrent problems, and follow-up care. See WAC 296-20-01002 for "BR" By Report instructions.

(15) Surgery modifiers: (For other modifiers, see appropriate sections.)

Listed values and procedures may be modified under certain circumstance. When applicable, the modifying circumstance should be identified by the addition of the appropriate "modifier code number" which is a two digit number placed after the usual procedure number from which it is separated by a hyphen. If more than one modifier is used, the "multiple modifiers" placed first after the procedure code indicates one or more additional modifier codes will follow. All modifiers and their respective codes are listed in Appendix A. Modifiers commonly used in surgery are as follows:

Unit Value

-20 When the surgical service is performed using the techniques of micro-surgery in an operating room and under the operating microscope, the modifier -20 may be added to the surgical procedure. The use of this modifier is not warranted when surgery is done with the aid of a magnifying loupe or magnifying binoculars worn by the surgeon. A special report may be appropriate to document the necessity of the micro-surgical approach. The total value of the surgical procedure may be increased by 20%. A special report may be appropriate to document the necessity of the micro-surgical approach. The department will publish a list of surgical procedures that have approval for this modifier.

-22 UNUSUAL SERVICES: When the service(s) provided is greater than that usually required for the listed procedure, it may be identified by adding modifier '-22' to the usual procedure number. List modified value. A report may be required.

-23 UNUSUAL ANESTHESIA: Periodically, a procedure, which usually requires either no anesthesia or local anesthesia, because of unusual circumstances must be done under general anesthesia. This circumstance may be reported by adding the modifier '-23' to the procedure code of the basic service. BR

	Unit Value		Unit Value
-25		DIGITAL RADIOLOGY (e.g., digital subtraction angiography, digital fluoroscopy, digital radiography). When this technique is utilized, the modifier '-25' may be appended to the appropriate five digit number of the radiologic procedure to indicate that the digital modality was applied. The modifier would be applied to both the supervision and interpretation service and complete procedure. When the supervision and interpretation service code is utilized and the injection is done by a second physician, the modifier need not be applied to the surgical injection codes.	
-26		PROFESSIONAL COMPONENT: Certain procedures (e.g., laboratory, radiology, electrocardiogram, specific diagnostic and therapeutic services) are a combination of a physician component and a technical component. When the physician component is reported separately, the service may be identified by adding the modifier '-26' to the usual procedure number. BR Payment is made on the basis of up to and including forty percent of the fee maximum.	
-47		ANESTHESIA BY SURGEON: When regional or general anesthesia is provided by the surgeon, it may be reported by adding to modifier '-47' to the basic service. (This does not include local anesthesia.) Use the "basic" anesthesia value only. (Note: Surgical units and anesthesia units are not of the same dollar values.) List separately from the surgical service provided and identify by adding this modifier '-47' to the usual procedure number. (For local infiltration, digital block or topical anesthesia, see WAC 296-21-125, item 5.)	
-50		BILATERAL PROCEDURE: Unless otherwise identified in the listings, bilateral procedures requiring a separate incision that are performed at the same operative session, should be identified by the appropriate five digit code describing the first procedure. The second (bilateral) procedure is identified by adding modifier -50 to the procedure number and value at 50% of	
			the listed value(s) unless otherwise indicated.
	-51		MULTIPLE PROCEDURES: When multiple procedures which add significant time or complexity to patient care are provided at the same operative session, identify and value the first or major procedure as listed. Identify secondary or lesser procedure(s) by '-51' to the usual procedure number(s) and value at 50% of the listed value(s) unless otherwise indicated.
	-52		REDUCED VALUES: Under certain circumstances, the listed value for a procedure is reduced or eliminated at the physician's election. Under these circumstances, the service provided can be identified by its usual procedure number and the addition of modifier '-52', signifying that the service is reduced. For example: (a) Incidental procedures (e.g., incidental appendectomies, incidental scar excisions, puncture of ovarian cysts, simple lysis of adhesions, simple repair of a hiatal hernia, etc.) do not warrant an additional charge. (b) When the listed value is reduced in conformity with a ground rule (e.g., rereduction of a fracture). (c) When charges for multiple procedures (e.g., multiple lacerations, etc.) are reduced at the physician's election to achieve an appropriate total charge.
	-54		SURGICAL PROCEDURE ONLY: When one physician performs the surgical procedure and another provides the pre and/or postoperative management surgical services may be identified by adding the modifier '-54' to the usual procedure number. Value may be apportioned between them by agreement.
	-55		POSTOPERATIVE MANAGEMENT ONLY: When one physician performs the postoperative management and another has performed the surgical procedure, the post operative component may be identified by adding the modifier '-55' to

Unit
Value

Unit
Value

the usual procedure number. Value may be apportioned between them by agreement.

number(s) and valued as agreed upon.

-56 PREOPERATIVE MANAGEMENT ONLY: When one physician performs the preoperative care and evaluation and another physician performs the surgical procedure, the preoperative component may be identified by adding the modifier '-56' to the usual procedure number.

(Usual charges for surgical assistance may also be warranted if still another physician is required as part of the surgical team.)

Value is apportioned as per agreement between practitioners involved.

-66 SURGICAL TEAM: Under some circumstances, highly complex procedures requiring the concomitant services of several physicians, often of different specialties plus other highly skilled, specially trained personnel and various types of complex equipment are carried out under the "surgical team" concept. Such circumstances should be identified by adding this modifier '-66' to the basic procedure number. The value should be supported by a report to include itemization of the physician(s) services, paramedical personnel and equipment included in the charge BR

-62 TWO SURGEONS: Under certain circumstances the skills of two surgeons (usually with different skills) may be required in the management of a specific surgical problem (e.g., a urologist and a general surgeon in the creation of an ileal conduit, etc.). By prior agreement, the total value may be apportioned in relation to the responsibility and work done. The total value may be increased by 25% in lieu of the assistant's charge. Under these circumstances the services of each surgeon should be identified by adding this modifier '-62' to the joint procedure number(s) and valued as agreed upon.

-68 COMPLICATIONS: Complications or circumstances requiring unusual additional services during the listed follow-up period may warrant additional charges on a fee-for-service basis. Identify these conditions by adding this modifier '-68' to the usual procedure number(s) for the additional service(s) rendered and indicate the appropriate value(s). May require a report.

(Usual charges for surgical assistance may also be warranted if still another physician is required as part of the surgical team.)

-75 CONCURRENT CARE, SERVICES RENDERED BY MORE THAN ONE PHYSICIAN: When the patient's condition requires the additional services of more than one physician, each physician may identify his or her services by adding the modifier '-75' to the basic service performed.

-64 CO-SURGEONS: Under certain circumstances, two surgeons (usually with similar skills) may function simultaneously as primary surgeons performing distinct parts of a total surgical service (e.g., two surgeons simultaneously applying skin grafts to different parts of the body or two surgeons repairing different fractures in the same patient). By prior agreement, the total value may be apportioned in relation to the responsibility and work done. The total value may be increased by 25% in lieu of the usual assistant's charge. Under these circumstances the services of each surgeon should be identified by adding this modifier '-64' to the joint procedure

-76 REPEAT PROCEDURE BY SAME PHYSICIAN: The physician may need to indicate that a procedure or service was repeated subsequent to the original service. This may be reported by adding the modifier '-76' to the procedure code of the repeated service.

-77 REPEAT PROCEDURE BY ANOTHER PHYSICIAN: The physician may need to indicate that a basic procedure performed by another physician had

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- to be repeated. This may be reported by adding modifier '-77' to the repeated service.
- 80 ASSISTANT SURGEON: Surgical assistant services are identified by adding this modifier '-80' to the usual procedure number(s) and are valued at 20% of the listed value of the surgical procedure(s)
- OR
- 81 MINIMUM ASSISTANT SURGEON ALLOWANCE: Identify by adding this modifier '-81' to the usual procedure number and value at 1.7
- 90 REFERENCE (OUTSIDE) LABORATORY: When laboratory procedures are performed by a party other than the treating or reporting physician, the procedure may be identified by adding the modifier '-90' to the usual procedure number.
- 99 MULTIPLE MODIFIERS: Under certain circumstances, two or more modifiers may be necessary to completely delineate a service.
- In such situations, modifier '-99' should be added to the procedure number and other applicable modifiers may be listed as part of the description of the service BR

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-22-010, filed 1/8/87; 86-20-074 (Order 86-36), § 296-22-010, filed 10/1/86, effective 11/1/86; 86-06-032 (Order 86-19), § 296-22-010, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-010, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-010, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-010, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-010, filed 1/30/74; Order 70-12, § 296-22-010, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-22-010, filed 11/27/68, effective 1/1/69.]

INTEGUMENTARY SYSTEM

WAC 296-22-021 Excision--Debridement.

DEBRIDEMENT

- (For dermabrasions, see 15780-15800)
- (For nail debridement, see 11700-11711)
- (For burn(s), see 16000-16030)

Unit Value		Unit Value	Follow-up Days=	Basic Anes@
*11000	Debridement of extensive eczematous or infected skin; up to 10% of body surface	*0.4	0	3.0
11001	each additional 10% of the body surface	0.2		3.0
11040	Debridement; skin, partial thickness	BR+		3.0
11041	skin, full thickness	BR		3.0
11042	skin and subcutaneous tissue	BR		3.0
11043	skin, subcutaneous tissue, and muscle	BR		3.0
11044	skin, subcutaneous tissue, muscle, and bone	BR		3.0
PARING OR CURETTMENT				
11050*	Paring or curettment of benign lesion with or without chemical cauterization (such as verrucae or clavi); single lesion	0.5	0	3.0
11051	two to four lesions	0.6		3.0
11052	more than four lesions	0.7		3.0
EXCISION AND SIMPLE CLOSURE				
(Not reconstructive surgery; for reconstructive surgery see repair-complex)				
(For electro-surgical and other methods, see 17000 et seq.)				
BIOPSY				
11100	Biopsy of skin, subcutaneous tissue and/or mucous membrane (including simple closure), unless otherwise listed (separate procedure); one lesion	0.6	7	3.0
11101	each additional lesion	0.2	7	3.0
(For biopsy of conjunctiva, see 68100; eyelid, see 67810)				
EXCISION-BENIGN LESIONS				
Excision (including simple closure) of benign lesions of skin or subcutaneous tissues (e.g., cicatricial, fibrous, inflammatory, congenital, cystic lesions), including local anesthesia. See appropriate size and area below.				
(For electrosurgical and other methods see 17000 et seq.)				
*11200	Excision, skin tags, multiple fibrocuteaneous tags, any area; up to 15	*0.4	0	3.0
11201	each additional 10 lesions	0.2		3.0
(For electrosurgical destruction, see 17200, 17201)				
(For multiple lesions, see WAC 296-22-010, item 7)				
11400	Excision, benign lesion, except skin tag (unless listed elsewhere), trunk, arms or legs; lesion diameter 0.5 cm or less	0.6	15	3.0
11401	lesion diameter 0.6 to 1.0 cm	0.8	15	3.0
11402	lesion diameter 1.1 to 2.0 cm	1.0	15	3.0
11403	lesion diameter 2.1 to 3.0 cm	1.2	15	3.0
11404	lesion diameter 3.1 to 4.0 cm	1.4	15	3.0
11406	lesion diameter over 4.0 cm	1.6	15	3.0
(For unusual or complicated excision, add modifier -22)				

	Unit Value	Follow-up Days=	Basic Anes@
11420	0.8	15	3.0
11421	1.0	15	3.0
11422	1.2	15	3.0
11423	1.4	15	3.0
11424	1.6	15	3.0
11426	1.8	15	3.0

(For unusual or complicated excision, add modifier -22)

11440	1.0	15	3.0
11441	1.2	15	3.0
11442	1.4	15	3.0
11443	1.6	15	3.0
11444	1.8	15	3.0
11446	2.0	15	3.0

(For unusual or complicated excision, add modifier -22)

(For eyelids involving more than skin, see also 67800 et seq.)

11450	BR		3.0
11451	BR		3.0
11462	BR		3.0
11463	BR		3.0
11470	BR		3.0
11471	BR		3.0

(When skin graft or flap is used for closure, use appropriate procedure code in addition)

(For bilateral procedure, add modifier -50)

EXCISION-MALIGNANT LESIONS

Excision (including simple closure) or treatment by any other method (except radiation or chemosurgery) of malignant lesion of skin, including local anesthesia, each lesion:

11600	1.2	90	3.0
11601	1.6	90	3.0
11602	2.0	90	3.0
11603	2.4	90	3.0
11604	2.8	90	3.0
11606	3.2	90	3.0
11620	2.0	90	3.0
11621	3.0	90	3.0
11622	4.0	90	3.0
11623	5.0	90	3.0
11624	6.0	90	3.0

11626	7.0	90	3.0
11640	3.0	90	3.0
11641	4.0	90	3.0
11642	5.0	90	3.0
11643	6.0	90	3.0
11644	7.0	90	3.0
11646	8.0	90	3.0

(For eyelids involving more than skin, see also 67800 et seq.)

NAILS

(For drainage of paronychia or onychia, see 10100, 10101)

*11700	*0.3	0	3.0
11701	0.15		
11710	*0.4	0	3.0
11711	0.2		3.0
*11730	*0.4	0	3.0
11731	0.2		
11732	0.1		
11740	0.3	0	3.0
11750	2.0	30	3.0
11752	3.0	30	3.0
11760	2.5	0	3.0
11762	3.0	0	3.0

(For skin graft, if used, see 15050)

MISCELLANEOUS

(For incision of pilonidal cyst, see 10080, 10081)

11770	2.0	30	3.0
11771	7.0	60	3.0
11772	BR+		3.0

(For hemangioma, see 11400-11446, 13100-15730)

(For hidradenitis, see 10060-10061, 11450-11471)

(For lipoma, see 11400-11446, 13100-15730)

(For lymph node dissection, see 38700-38780)

(For ulcer, vascular or inflammatory, see 11400-11446, 13100-15730)

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-021, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-021, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-021, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-021, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-021, filed 1/30/74; Order 68-7, § 296-22-021, filed 11/27/68, effective 1/1/69.]

WAC 296-22-022 Introduction.

	Unit Value	Follow-up Days=	Basic Anes@
*11900 Injection, intralesional; up to and including seven lesions	*0.4	0	3.0
*11901 more than seven lesions	*0.72	0	3.0
(For veins, see 36470, 36471)			
11920 Tattooing, intradermal introduction of insoluble opaque pigments to correct color defects of skin; 6.0 sq cm or less	BR		3.0
11921 6.1 to 20.0 sq cm	BR		3.0
11922 each additional 20.0 sq cm	BR		3.0
11950 Subcutaneous injection of "filling" material (e.g., silicone); 1 cc or less	BR		3.0
11951 1.1 to 5 cc	BR		3.0
11952 5.1 to 10 cc	BR		3.0
11954 over 10 cc	BR		3.0
11960 Insertion of tissue expander	BR		3.0
11970 Replacement of tissue expander with permanent prosthesis	BR		3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-022, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-022, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-022, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-022, filed 1/30/74; Order 68-7, § 296-22-022, filed 11/27/68, effective 1/1/69.]

WAC 296-22-023 Repair. The repair of wounds may be classified as simple, intermediate or complex.

SIMPLE REPAIR is used when the wound is superficial; i.e., involving skin and/or subcutaneous tissues, without significant involvement of deeper structures, and which requires simple suturing. For closure with adhesive strips, list appropriate visit only.

INTERMEDIATE REPAIR includes the repair of wounds that, in addition to the above, require layer closure. Such wounds usually involve deeper layers such as fascia or muscle, to the extent that at least one of deeper layers requires separate closure.

COMPLEX REPAIR includes the repairs of wounds requiring reconstructive surgery, complicated wound closures, skin grafts or unusual and time consuming techniques of repair to obtain the maximum functional and cosmetic result. It may include creation of the defect and necessary preparation for repairs or the debridement and repair of complicated lacerations or avulsions.

Instructions for listing services at time of wound repair.

1. The repaired wound(s) should be measured and recorded in centimeters, whether curved, angular or stellate.

2. When multiple wounds are repaired, add together the lengths of those in the same classification (see above) and report as a single item.

When more than one classification of wounds is repaired, list the more complicated as the primary procedure and the less complicated as the secondary procedure, using modifier '-50'.

3. Decontamination and/or debridement: Only when gross contamination requires prolonged cleansing is this to be considered a separate procedure. Debridement is considered a separate procedure only when appreciable amounts of devitalized or contaminated tissue are removed.

4. Involvement of nerves, blood vessels and tendons: Report under appropriate system (nervous, cardiovascular, musculoskeletal) for repair of these structures. The repair of the associated wound is included in the primary procedure unless it qualifies as a complex wound, in which case modifier '-50' applies.

Simple ligation of vessels in an open wound is considered as part of any wound closure.

Simple "exploration" of nerves, blood vessels or tendons exposed in an open wound is also considered part of the essential treatment of the wound and is not a separate procedure unless appreciable dissection is required.

	Unit Value	Follow-up Days=	Basic Anes@
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REPAIR-SIMPLE

(Sum of lengths of repairs)

12001*	Simple repair of superficial wounds of scalp, neck, axillae, external genitalia, trunk and/or extremities (including hands and feet); 2.5 cm or less	0.4	0	3.0
12002*	2.6 cm to 7.5 cm	0.6	0	3.0
12004*	7.6 cm to 12.5 cm	0.8	0	3.0
12005	12.6 cm to 20.0 cm	1.0	0	3.0
12006	20.1 cm to 30.0 cm	1.2	0	3.0
12007	over 30.0 cm	BR		3.0
12011*	Simple repair of superficial wounds of face, ears, eyelids, nose, lips and/or mucous membranes; 2.5 cm or less	0.6	0	3.0
12013*	2.6 cm to 5.0 cm	0.8	0	3.0
12014	5.1 cm to 7.5 cm	1.0	0	3.0
12015	7.6 cm to 12.5 cm	1.2	0	3.0
12016	12.6 cm to 20.0 cm	1.4	0	3.0
12017	20.1 cm to 30.0 cm	1.6	0	3.0
12018	over 30.0 cm	BR		3.0
12020	Treatment of superficial wound dehiscence; simple closure	BR		3.0
12021	with packing	BR		3.0

(For extensive or complicated secondary wound closure, see 13160)

REPAIR-INTERMEDIATE

12031*	Layer closure of wounds of scalp, axillae, trunk and/or extremities (excluding hands and feet); 2.5 cm or less	0.6	0	3.0
12032*	2.6 cm to 7.5 cm	0.8	0	3.0
12034	7.6 cm to 12.5 cm	1.0	0	3.0
12035	12.6 cm to 20.0 cm	1.2	0	3.0
12036	20.1 cm to 30.0 cm	1.4	0	3.0
12037	over 30.0 cm	BR		3.0
12041*	Layer closure of wounds of neck, hands, feet and/or external genitalia; 2.5 cm or less	0.8	0	3.0
12042	2.6 cm to 7.5 cm	1.0	0	3.0
12044	7.6 cm to 12.5 cm	1.2	0	3.0
12045	12.6 cm to 20.0 cm	1.4	0	3.0
12046	20.1 cm to 30.0 cm	1.6	0	3.0
12047	over 30.0 cm	BR		3.0

	Unit Value	Follow-up Days=	Basic Anes@
12051* Layer closure of wounds of face, ears, eyelids, nose, lips and/or mucous membranes; 2.5 cm or less	1.0	0	3.0
12052 2.6 cm to 5.0 cm	1.2	0	3.0
12053 5.1 cm to 7.5 cm	1.4	0	3.0
12054 7.6 cm to 12.5 cm	1.6	0	3.0
12055 12.6 cm to 20.0 cm	1.8	0	3.0
12056 20.1 cm to 30.0 cm	2.0	0	3.0
12057 over 30.0 cm	BR		3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-023, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-023, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-023, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-023, filed 1/30/74; Order 68-7, § 296-22-023, filed 11/27/68, effective 1/1/69.]

WAC 296-22-024 Repair--Complex.

(Reconstructive procedures, complicated wound closure, skin grafts, pedicle flaps)

(For full thickness repair of lip or eyelid, see respective anatomical subsections)

	Unit Value	Follow-up Days=	Basic Anes@
13100 Repair, complex, trunk; 1.1 cm to 2.5 cm	1.2	30	3.0
(For 1.0 cm or less, see simple or intermediate repairs)			
13101 2.6 cm to 7.5 cm	3.0	30	3.0
13120 Repair, complex, scalp, arms, and/or legs; 1.1 cm to 2.5 cm	1.8	30	3.0
(For 1.0 cm or less, see simple or intermediate repairs)			
13121 2.6 cm to 7.5 cm	4.0	30	3.0
13131 Repair, complex, forehead, cheeks, chin, mouth, neck, axillae, genitalia, hands and/or feet; 1.1 cm to 2.5 cm	2.4	30	4.0
(For 1.0 cm or less, see simple or intermediate repairs)			
13132 2.6 cm to 7.5 cm	6.0	30	4.0
13150 Repair, complex, eyelids, nose, ears and/or lips; 1.0 cm or less	2.0	30	4.0
(See also 40650-40654, 67952-67975)			
13151 1.1 cm to 2.5 cm	3.0	30	4.0
13152 2.6 cm to 7.5 cm	8.0	30	4.0
13160 Secondary closure of surgical wound dehiscence, extensive or complicated	BR		4.0
(For packing or simple secondary wound closure, see 12020, 12021)			
13300 Repair, unusual, complicated,			

over 7.5 cm, any area BR 4.0

ADJACENT TISSUE TRANSFER OR REARRANGEMENT

(For full thickness repair of lip or eyelid, see respective anatomical subsections)

Excision and/or repair by adjacent tissue transfer or rearrangement (e.g., Z-plasty, W-plasty, V-Y plasty, rotation flap, advancement flap, double pedicle flap). When applied in repairing lacerations, the procedures listed must be developed by the surgeon to accomplish the repair. They do not apply when direct closure or rearrangement of traumatic wounds incidentally result in these configurations.

(Skin graft necessary to close secondary defect considered an additional procedure)

14000 Adjacent tissue transfer or rearrangement, trunk; defect 10 sq cm or less	4.0	60	3.0
14001 defect 10.1 sq cm to 30 sq cm	6.0	60	3.0
14020 Adjacent tissue transfer or rearrangement, scalp, arms and/or legs; defect up to 10 sq cm	6.0	60	4.0
14021 defect 10 sq cm to 30 sq cm	8.0	60	4.0
14040 Adjacent tissue transfer or rearrangement, forehead, cheeks, chin, mouth, neck, axillae, genitalia, hands and/or feet; defect up to 10 sq cm	8.0	60	4.0
14041 defect 10 sq cm to 30 sq cm	10.0	60	4.0
14060 Adjacent tissue transfer or rearrangement, eyelids, nose, ears and/or lips; defect up to 10 sq cm	10.0	60	4.0
14061 defect 10 sq cm to 30 sq cm	14.0	60	4.0
(For eyelid, full thickness, see 67952 et seq.)			
14300 Adjacent tissue transfer or rearrangement, more than 30 sq cm, unusual or complicated, any area	BR		4.0
14350 Filleted finger or toe flap, including preparation of recipient site	BR		3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-024, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-024, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-024, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-024, filed 1/30/74; Order 68-7, § 296-22-024, filed 11/27/68, effective 1/1/69.]

WAC 296-22-025 Free skin grafts. Identify by the size and location of the defect (recipient area) and the type of graft; includes simple debridement of granulations or recent avulsion.

When a primary procedure such as orbitectomy, radical mastectomy or deep tumor removal requires skin graft for definitive closure, see appropriate anatomical

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subsection for primary procedure and this section for skin graft.

(Repair of donor site requiring skin graft or local flaps to be added as additional procedure)

	Unit Value	Follow-up Days=	Basic Anes@
15000 Excisional preparation or creation of recipient site by excision of essentially intact skin (including subcutaneous tissue), scar, or other lesion prior to repair with free skin graft (list as separate service in addition to skin graft)	*3.6		3.0
(For appropriate skin grafts, see 15050-15261; list the free graft separately by its procedure number when the graft, immediate or delayed is applied)			
*15050 Pinch graft, single or multiple, to cover small ulcer, tip of digit or other minimal open area (except on face), defect size 2 cm diameter	*1.2	0	3.0
15100 Split graft, trunk, scalp, arms, legs, hands and/or feet (except multiple digits); 100 sq cm or less, or each one percent of body area of infants and children (except 15050)	6.0	45	4.0
15101 each additional 100 sq cm, or each one percent of body area of infants and children, or part thereof	1.2		4.0
15120 Split graft, face, eyelids, mouth, neck, ears, orbits, genitalia, and/or multiple digits; 100 sq cm or less, or each one percent of body area of infants and children (except 15050)	11.0	45	4.0
15121 Each additional 100 sq cm, or each one percent of body area of infants and children, or part thereof	2.0		4.0
(For eyelids, see also 67961 et seq.)			
15200 Full thickness graft, free, including direct closure of donor site, trunk; 20 sq cm or less	4.0	45	3.0
15201 each additional 20 sq cm	2.0		
15220 Full thickness graft, free, including direct closure of donor site, scalp, arms and/or legs; 20 sq cm or less	6.0	45	3.0
15221 each additional 20 sq cm	3.0		
15240 Full thickness graft, free, including direct closure of donor site, forehead, cheeks, chin, mouth, neck, axillae, genitalia, hands and/or feet; 20 sq cm or less	8.0	45	4.0
(For finger tip graft, see 15050)			
(For repair of syndactyly, fingers, see 26560-26562)			
15241 each additional 20 sq cm	4.0		4.0
15260 Full thickness graft, free, including direct closure of donor site, nose, ears, eyelids, and/or lips; 20 cm or less	10.0	45	4.0

	Unit Value	Follow-up Days=	Basic Anes@
15261 each additional 20 sq cm	5.0		
(For eyelids, see also 67961 et seq.)			
(Repair of donor site requiring skin graft or local flaps, to be added as additional separate procedure)			
15350 Homograft, skin	5.0	45	3.0
15400 Heterograft, skin	6.0	45	3.0
15410 Free transplantation of skin flap by microsurgical technique, including microvascular anastomosis; 100 sq cm or less	5.0	45	3.0
15412 between 101 and 160 sq cm	6.0	45	3.0
15414 between 161 and 230 sq cm	7.0	45	3.0
15416 over 230 sq cm	BR		3.0

PEDICLE FLAPS (SKIN AND DEEP TISSUES)

Regions listed refer to the recipient area (not donor site) when flap is being attached in transfer or to final site.

Regions listed refer to donor site when tube is formed for later transfer or when "delay" of flap is prior to transfer.

Procedures 15500-15730 do not include extensive immobilization, e.g., large plaster casts and other immobilizing devices are considered additional separate procedures.

(Repair of donor site requiring skin graft or local flaps is considered an additional separate procedure)

15500 Formation of tube pedicle without transfer, or major "delay" of large flap without transfer; on trunk	7.0	45	3.0
15505 on scalp, arms or legs	7.0	45	3.0
15510 on forehead, cheeks, chin, mouth, neck, axillae, genitalia, hands or feet	7.0	45	3.0
15515 on eyelids, nose, ears or lips	7.0	45	3.0
15540 Primary attachment of open or tubed pedicle flap to recipient site requiring minimal preparation; to trunk	9.0	45	3.0
15545 to scalp, arms and legs	9.0	45	3.0
15550 to forehead, cheeks, chin, mouth, neck, axillae, genitalia, or hands, feet	9.0	45	3.0
(For cross finger pedicle flap, see 15580)			
15555 to eyelids, nose, ears and lips	9.0	45	3.0
15580 cross finger pedicle flap, including free graft to donor site	9.0	45	3.0
(For major debridement or excisional preparation of recipient area at the time of attachment of pedicle flap, see 15700-15730)			
15600 Intermediate "delay" of any flap, primary "delay" of small flap, or sectioning pedicle of tubed or direct flap; at trunk	4.0	45	3.0
15610 at scalp, arms and legs	5.0	45	3.0
15620 at forehead, cheeks, chin, neck, axillae, genitalia, hands (except 15625), or feet	6.0	45	3.0

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
15625				(For bilateral blepharoplasty, add modifier -50)			
				(See also 67916, 67917, 67923, 67924)			
15630	6.0	45	3.0	15824	10.0	30	3.0
15650	6.0	45	3.0	15826	8.0	30	3.0
15700	BR+		3.0				
				(15827 is deleted. To report use 15838)			
15710	9.0	45	3.0	15828	30.0	45	3.0
15720	11.0	45	4.0	15829	BR		3.0
15730	16.0	45	4.0				
	16.0	45	4.0				
				(For bilateral rhytidectomy, add modifier -50)			
				15831			
				Excision, excessive skin and subcutaneous tissue (including lipectomy); abdomen			
				(abdominoplasty)	30.0	45	3.0
				15832	25.0	45	3.0
				15833	30.0	45	3.0
				15834	30.0	45	3.0
				15835	30.0	45	3.0
				15836	25.0	45	3.0
				15837	25.0	45	3.0
				15838	BR		3.0
				15839			
				(For bilateral procedure, add modifier -50)	BR		3.0
				15840			
				Graft for facial nerve paralysis; free fascia graft, (including obtaining fascia)	30.0	90	3.0
				(For bilateral procedure, add modifier -50)			
				15841			
				free muscle graft (including obtaining graft)	35.0	45	3.0
				15842			
				free muscle graft by microsurgical technique.	35.0	45	3.0
				15845	BR+		3.0
				(For intravenous fluorescein examination of blood flow in graft or flap, see 15860)			
				(For nerve transfers, decompression, or repair, see 64830-64876, 64905-64907, 69720-69725, 69740-69745, 69955)			
				15851			
				Removal of sutures in hospital or emergency room under anesthesia	BR		3.0
				15860			
				Intravenous injection of agent (e.g., fluorescein) to test blood flow in flap or graft	BR		3.0
				DECUBITUS ULCERS (PRESSURE SORES)			
				15920	BR		3.0
				15922	BR		3.0
				(15930 has been deleted. To report, use 15934)			
				15931			
				Excision, sacral decubitus ulcer; with primary suture	13.0		3.0
				(15932 has been deleted)			
				15933	BR		3.0
				15934			
				with ostectomy			
				Excision, sacral pressure ulcer, with local or regional			

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	Unit Value	Follow-up Days=	Basic Anes@
skin flap closure (e.g., advancement, rotation, rhomboid, bipedicle);	20.0		3.0
15935 with ostectomy	BR		3.0
15936 Excision, sacral pressure ulcer, with other flap closure;	BR		3.0
15937 with ostectomy	BR		3.0
(To identify other flap closure, use also code number for specific flap)			
15940 Excision, ischial decubitus ulcer; direct suture	BR		3.0
15941 with ostectomy (ischietomy) ...	BR		3.0
(15942, 15943 have been deleted. To report, use 15944-15946)			
15944 Excision, ischial pressure ulcer, with local or regional skin flap closure;	BR		3.0
15945 with ostectomy	BR		3.0
15946 Excision, ischial pressure ulcer, with ostectomy, with muscle flap or myocutaneous flap closure	BR		3.0
(To identify muscle or myocutaneous flap closure, use also code number for specific flap)			
15950 Excision, trochanteric pressure ulcer; with primary suture	BR		3.0
15951 with ostectomy	BR		3.0
15952 Excision, trochanteric pressure ulcer, with local rotation skin flap closure	BR		3.0
15953 skin flap closure, with ostectomy	BR		3.0
15954 Excision, trochanteric pressure ulcer, with bipedicle flap closure;	BR		3.0
15955 with ostectomy	BR		3.0
15956 Excision, trochanteric pressure ulcer, with muscle or myocutaneous flap closure; ...	BR		3.0
15958 with ostectomy	BR		3.0
(To identify muscle or myocutaneous flap closure, use also code number for specific flap)			
15960 Excision, heel pressure ulcer; with primary suture	BR		3.0
15961 with ostectomy	BR		3.0
(15962, 15963, have been deleted. To report use 15964-15967)			
15964 Excision, heel pressure ulcer, with local skin flap closure; ..	BR		3.0
15965 with ostectomy	BR		3.0
15966 Excision, heel pressure ulcer, with other flap closure;	BR		3.0
15967 with ostectomy	BR		3.0
(To identify other flap closure, use also code number for specific flap)			

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-025, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-025, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-025, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-025, filed 11/30/81, effective 1/1/82; 80-18-055 (Order

80-25), § 296-22-025, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-025, filed 1/30/74; Order 68-7, § 296-22-025, filed 11/27/68, effective 1/1/69.]

WAC 296-22-031 Breast.

	Unit Value	Follow-up Days=	Basic Anes@
EXCISION			
(All codes for bilateral procedures have been deleted. To report, add modifier -50)			
*19100 Biopsy of breast, needle (separate procedure)	*0.6	0	
19101 incisional	3.6	30	3.0
19110 Nipple exploration, with or without excision of a solitary lactiferous duct or a papilloma lactiferous duct	BR		
19112 Excision of lactiferous duct fistula	BR		
19120 Excision of cyst, fibroadenoma or other benign or malignant tumor, aberrant breast tissue, duct lesion or nipple lesion (except 19140), male or female, one or more lesions;	5.0	30	3.0
19140 Mastectomy for gynecomastia through circumareolar or other incision,	8.0	60	3.0
19160 Mastectomy, partial;	6.0	60	3.0
19162 with axillary lymphadenectomy	BR		3.0
19180 Mastectomy, simple complete; ...	8.0	45	3.0
(For immediate or delayed insertion of implant, use 19340 or 19342)			
(For gynecomastia, see 19140, 19141)			
19182 Mastectomy, subcutaneous;	10.0	60	3.0
(When performed in conjunction with reduction mammoplasty, use also 19318)			
(19184-19187 have been deleted. To report, use 19182 with 19340 or 19342)			
(For supplemental skills of two surgeons, see WAC 296-22-010 item 5 and modifier -62)			
(For supply of prosthetic implant, see 99070)			
19200 Mastectomy, radical, including breast, pectoral muscles, axillary lymph nodes	18.0	60	3.0
(19211-19216 have been deleted. To report, use 19200 with 19340 or 19342)			
19220 Mastectomy, radical, including breast, pectoral muscles, axillary and internal mammary lymph nodes (Urban type operation) ...	26.0	60	11.0
(19224-19229 have been deleted. To report, use 19220 with 19340 or 19342)			
19240 Mastectomy, modified radical, with modified axillary dissection			

	Unit Value	Follow-up Days=	Basic Anes@
but leaving pectoral muscles (19250-19255 have been deleted. To report, use 19240 with 19340 or 19342) (For supply of prosthetic implant, see 99070)	16.0	60	3.0
19260 Excision of chest wall tumor including ribs	BR+		9.0
19271 Excision of chest wall tumor involving ribs, with plastic reconstruction; without mediastinal lymphadenectomy	BR+		9.0
19272 with mediastinal lymphadenectomy	BR		9.0

Repair and reconstruction

(19300-19304 have been deleted. To report, see 19316, 19318)

(19310, 19311 have been deleted. To report, use 19325)

(All codes for bilateral procedures have been deleted. To report, add modifier -50)

19316 Mastopexy	BR	90	3.0
19318 Reduction mammoplasty	BR	90	3.0
19324 Mammoplasty, augmentation; without prosthetic implant	BR	90	3.0
19325 with prosthetic implant	BR	90	3.0

(For flap or graft, use also appropriate number)

19328 Removal of intact mammary implant	BR	30	3.0
19330 Removal of mammary implant material	BR	30	3.0

19340 Immediate insertion of breast prosthesis following mastopexy, mastectomy or in reconstruction	BR	30	3.0
19342 Delayed insertion of breast prosthesis following mastopexy, mastectomy or in reconstruction	BR	30	3.0

(For supply of implant, use 99070)

(For preparation of custom breast implant, see 19396)

19350 Reconstruction of nipple and/or areola	BR	30	3.0
19360 Breast reconstruction with muscle or myocutaneous flap	BR	90	3.0

(Use also code number for specific flap)

19364 Breast reconstruction with free flap	BR	90	3.0
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(Use also code number for specific flap)

19366 Breast reconstruction with other technique	BR	90	3.0
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(For microsurgical technique, add modifier -20)

(For insertion of prosthesis, use also 19340 or 19342)

19370 Open periprosthetic capsulotomy, breast	BR		3.0
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	Unit Value	Follow-up Days=	Basic Anes@
19371 Periprosthetic capsulectomy, breast	BR		3.0
19380 Revision of reconstructed breast	BR		3.0
19396 Preparation of moulage for custom breast implant	BR		3.0
19499 Unlisted procedure, breast	BR		3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-031, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-031, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-031, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-031, filed 1/30/74; Order 68-7, § 296-22-031, filed 11/27/68, effective 1/1/69.]

MUSCULOSKELETAL SYSTEM

WAC 296-22-036 General.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
*20000 Incision of soft tissue abscess, secondary to osteomyelitis; superficial	*0.4	0	3.0
20005 deep or complicated	BR		3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-036, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-036, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-036, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-036, filed 1/30/74; Order 68-7, § 296-22-036, filed 11/27/68, effective 1/1/69.]

WAC 296-22-038 Introduction or removal.

	Unit Value	Follow-up Days=	Basic Anes@
(For injection procedure for arthrography, see anatomical area)			
20500 Injection of sinus tract; therapeutic (separate procedure)	0.4	0	
20501* diagnostic (sinogram) (separate procedure)	1.0	0	
*20520 Removal of foreign body in muscle; simple	*1.2	0	3.0
20525 deep or complicated	BR+		3.0
*20550 Injection, tendon sheath, ligament or trigger points	*0.4	0	
*20600 Arthrocentesis, aspiration and/or injection; small joint or bursa (e.g., fingers, toes)	*0.3	0	
*20605 intermediate joint or bursa (e.g., temporomandibular, acromioclavicular, wrist, elbow or ankle; olecranon bursa)	*0.4	0	
*20610 major joint or bursa (e.g., shoulder, hip, knee joint, subacromial bursa)	*0.6	0	
20615 Aspiration and injection for treatment of bone cyst	0.6		3.0
*20650 Insertion of wire or pin with application of skeletal traction, including removal (separate procedure)	*1.2	0	3.0

Surgical Fees

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	Unit Value	Follow-up Days=	Basic Anes@
20660 Application of tongs or caliper, including removal (separate procedure)	3.0	0	3.0
20661 Application of halo, including removal; cranial	3.0	0	3.0
20662 pelvic	3.0	0	3.0
20663 femoral	3.0	0	3.0
*20665 Removal of tongs or halo applied by another physician	0.3	0	
*20670 Removal of implant; superficial, (e.g., buried wire, pin or rod) (separate procedure)	*0.6	0	3.0
20680 deep (e.g., buried wire, pin, screw, metal band, nail, rod or plate)	3.6	21	4.0
20690 Application of external fixation system (e.g., Hoffmann apparatus); standard configuration	BR		3.0
20691 other than standard configuration	BR		3.0

(List numbers 20690 or 20691 in addition to code for treatment of closed or open fracture)

REPAIR

(For debridement as a separate procedure (e.g., in traumatic wound) involving soft tissue and/or bone, see 11043, 11044)

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-038, filed 7/23/87; 83-16-066 (Order 83-23), § 296-22-038, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-038, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-038, filed 1/30/74; Order 68-7, § 296-22-038, filed 11/27/68, effective 1/1/69.]

WAC 296-22-039 Reimplantation.

	Unit Value	Follow-up Days=	Basic Anes@
REIMPLANTATION			
20802 Replantation, arm (includes surgical neck of humerus through elbow joint); complete (amputation)	BR		3.0
20804 incomplete (amputation devascularized extremity with soft tissue pedicle)	BR		3.0
20805 Replantation, forearm (includes radius and ulna to radial carpal joint; complete amputation	BR		3.0
20806 incomplete amputation (devascularized extremity with soft tissue pedicle)	BR		3.0
20808 Replantation, hand (includes hand through metacarpophalangeal joints); complete amputation	BR		3.0
20812 incomplete (amputation devascularized extremity with soft tissue pedicle)	BR		3.0
20816 Replantation, digit excluding thumb (includes metacarpophalangeal joint to insertion of flexor sublimis tendon); complete amputation	BR		3.0
20820 incomplete (amputation devascularized extremity with			

	Unit Value	Follow-up Days=	Basic Anes@
20822 Replantation, digit, excluding thumb (includes distal tip to sublimis tendon insertion); complete amputation	BR		3.0
20823 incomplete amputation (devascularized extremity with soft tissue pedicle)	BR		3.0
20824 Replantation, thumb (includes carpometacarpal joint to MP joint); complete amputation	BR		3.0
20826 incomplete amputation (devascularized extremity with soft tissue pedicle)	BR		3.0
20827 Replantation, thumb (includes distal tip to MP joint); complete amputation	BR		3.0
20828 incomplete amputation (devascularized extremity with soft tissue pedicle)	BR		3.0
20832 Replantation, leg; complete amputation	BR		3.0
20834 (incomplete amputation devascularized extremity with soft tissue pedicle)	BR		3.0
20838 Replantation, foot; complete amputation	BR		3.0
20840 incomplete (amputation devascularized extremity with soft tissue pedicle)	BR		3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-039, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-039, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-039, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-039, filed 1/30/74; Order 68-7, § 296-22-039, filed 11/27/68, effective 1/1/69.]

WAC 296-22-042 Head.

(Skull, facial bones and temporomandibular joint)

INCISION

(For drainage of superficial abscess and hematoma, see 20000)

(For removal of embedded foreign body from dentoalveolar structure, see 41805, 41806)

	Unit Value	Follow-up Days=	Basic Anes@
21010 Arthrotomy, temporomandibular joint; unilateral	BR		3.0
21011 bilateral	BR		3.0

EXCISION

(For biopsy, see 20220, 20240)

21020 Craniectomy for sequestrectomy	BR		8.0
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(For craniectomy for osteomyelitis, see 61501)

(For other craniectomies, see 61304 et seq.)

21030 Excision of benign tumor or cyst of facial bone other than mandible	BR		5.0
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	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@	
21034	Excision of malignant tumor of facial bone other than mandible.	BR	5.0					
21040	Excision of benign cyst or tumor of mandible; simple	5.0	90	5.0				
21041	complex	BR	5.0					
21044	Excision of malignant tumor of mandible;	BR	5.0	21242	Arthroplasty, temporomandibular joint, with alloplastic material (e.g., silicone)	BR	5.0	
21045	radical resection	BR	5.0	21250	Osteoplasty of maxilla and/or other facial bones for midface hypoplasia or retrusion (LeFort type operation); without bone graft	BR	5.0	
	(For bone graft, see 21215)				with bone graft	BR	5.0	
21050	Arthroectomy, temporomandibular joint; unilateral	18.0	90	5.0	21254	BR	5.0	
	bilateral	20.0	90	5.0	21260	Orbital hypertelorism correction (periorbital) osteotomies, bilateral, with bone grafts; extracranial approach	BR	5.0
21060	Meniscectomy, temporomandibular joint; unilateral	18.0	90	5.0	21261	combined intra- and extracranial approach	BR	5.0
	bilateral	20.0	90	5.0	21263	with forehead advancement	BR	5.0
21061					21267	Orbital repositioning, periorbital osteotomies, unilateral, with bone grafts; extracranial approach	BR	5.0
21070	Coronoidectomy (separate procedure); unilateral	18.0	90	5.0	21268	combined intra- and extracranial approach	BR	5.0
	bilateral	20.0	90	5.0	21270	Reconstruction for Treacher Collins syndrome (periorbital and zygomatic reconstruction with multiple bone grafts)	BR	5.0
21071					21275	Secondary revision for orbitocraniofacial reconstruction	BR	5.0
						(For reconstruction of skull by bone flaps, see 61555)		
INTRODUCTION OR REMOVAL					21280	Medial canthoplasty	BR	5.0
	(For application or removal of caliper or tongs, see 20660, 20665)				21282	Lateral canthopexy	BR	5.0
*21100	Application of halo type appliance for maxillofacial fixation, includes removal (separate procedure)	*2.0	0	3.0	21295	Reduction of masseter muscle (e.g., treatment of benign masseteric hypertrophy); extraoral approach	BR	5.0
21110	Application of interdental fixation device for conditions other than fracture or dislocation	8.0	90	3.0	21296	intraoral approach	BR	5.0
21116	Injection procedure for temporomandibular arthrotopography	BR			FRACTURE AND/OR DISLOCATION			
	(For temporomandibular arthrotopography, see 70332)				21300	Treatment of closed skull fracture without operation	Sv.&	
REPAIR, REVISION OR RECONSTRUCTION						(For operative repair, see 62000-62010)		
	(For cranioplasty, see 62140-62145)				21310	Treatment of closed or open nasal fracture without manipulation	Sv.&	
21200	Osteoplasty of mandible for prognathism, micrognathism	30.0	90	5.0	*21315	Manipulative treatment nasal bone fracture; without stabilization	*1.1	0
21202	mandible, segmental	BR	90	5.0		with stabilization	3.0	90
21203	mandibular ramus (osteotomy)	BR	90	5.0	21325	Open treatment of nasal fracture; uncomplicated	4.0	90
21204	maxilla, total	BR	90	5.0	21330	complicated, with internal and/or external skeletal fixation	9.5	90
21206	maxilla, segmental	BR	90	5.0	21335	with concomitant open of fractured septum	17.0	90
21207	reduction genioplasty	BR		5.0	21337	Treatment of closed nasal septal fracture	BR	90
21210	Graft, bone; nasal, maxillary and malar areas (includes obtaining graft)	20.0	120	5.0	21338	Open treatment of nasoethmoid fracture; without external fixation	BR	90
	(For cleft palate repair, see 42200-42225)					with external fixation	BR	90
21215	mandible (includes obtaining graft)	20.0	120	5.0	21339	Treatment of closed or open nasoethmoid complex fracture, with splint, wire or headcap fixation, including repair of canthal	BR	90
21230	Graft; rib cartilage, autogenous, to face, chin, nose or ear (includes obtaining graft)	18.0	120	5.0				
21235	ear cartilage to nose or ear (includes obtaining graft)	12.0	60	5.0				
21239	Implant, chin, homologous, heterologous, or alloplastic	BR		5.0				
21240	Arthroplasty, temporomandibular joint; unilateral	BR+		5.0				
	(21241 has been deleted. To report bilateral procedure, use modifier -50)							
	(If bone or cartilage graft is used for temporomandibular							

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	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
ligaments and/or the nasolacrimal apparatus	BR		3.0	21433	complicated (e.g., multiple approaches)	BR	5.0
21345 Treatment of nasomaxillary complex fracture (LeFort II type), with interdental wire fixation or fixation of denture or splint	BR		3.0	21435	complicated, fixation by head cap, halo device, multiple surgical approaches, internal fixation, and/or wiring teeth	BR	5.0
21346 Open treatment of nasomaxillary complex fracture (LeFort II type); with wiring and/or local fixation	BR		3.0		(For removal of internal or external fixation device, see 20670)		
21347 with multiple approaches	BR		3.0	21440	Manipulative treatment of alveolar ridge fracture (separate procedure)	BR	5.0
(21350 has been deleted. If necessary to report, use appropriate medical encounter code)				21445	Open treatment of alveolar ridge fracture (separate procedure)	BR	5.0
*21355 Manipulative treatment of closed or open fracture of malar area, including zygomatic arch and malar tripod, towel clip technique	*1.0	2	3.0	21450	Treatment of closed or open mandibular fracture without manipulation	Sv.&	
21360 Open treatment of closed or open depressed malar fracture, including zygomatic arch and malar tripod	7.0	90	3.0	21451	with manipulation, may include external fixation	BR	5.0
21365 Open treatment of closed or open complicated (e.g., multiple fractures) of malar area, including zygomatic arch and malar tripod, with internal skeletal fixation and multiple surgical approaches	13.0	90	5.0	21452	Treatment of open mandibular fracture; without manipulation	BR	5.0
(21380 has been deleted. If necessary to report, use appropriate medical encounter code)				21453	with manipulation	BR	5.0
21385 Open treatment of orbital floor "blowout" fracture; transantral approach (Caldwell-Luc type operation)	12.0	90	3.0	21454	Open treatment of closed or open mandibular fracture with external fixation	BR	5.0
21386 periorbital approach	13.0	90	3.0	21455	Closed manipulative treatment by interdental fixation of closed or open mandibular fracture	8.0	90
21387 combined approach	15.0	90	3.0	21461	Open treatment of closed or open mandibular fracture; with or without interdental fixation	16.0	90
21390 periorbital approach, with alloplastic or other implant	14.0	90	3.0	21462	with interdental fixation	16.0	90
21395 periorbital approach with bone graft (includes obtaining graft)	18.0	90	3.0	21465	Open treatment of mandibular condylar fracture	BR	5.0
21400 Treatment of fracture of orbit, except "blowout"; without manipulation	SV			21470	Open treatment of complicated closed or open mandibular fracture by multiple surgical approaches including internal fixation, interdental fixation, and/or wiring of dentures or splints	BR	5.0
21401 with manipulation	6.0	90	3.0	21480	Uncomplicated treatment of temporomandibular dislocation, initial or subsequent	Sv.&	3.0
21406 Open treatment of fracture of orbit, except "blowout"; without implant	7.0	90	3.0	21485	Complicated manipulate treatment of temporomandibular dislocation, initial or subsequent	BR	3.0
21407 with implant	8.0	90	3.0	21490	Open treatment of temporomandibular dislocation	BR	3.0
(21420 has been deleted. If necessary to report, use appropriate medical encounter code)					(For interdental wire fixation, see 21462)		
21421 Treatment of palatal or alveolar ridge fractures (LeFort I type); closed manipulation with interdental wire fixation or fixation of denture or splint	7.0	90	3.0	21493	Treatment of closed or open hyoid fracture; without manipulation	SV	
21422 open treatment	12.0	90	3.0	21494	with manipulation	7.0	90
21431 Treatment of craniofacial separation (LeFort III type) using interdental wire fixation of denture or splint	8.0	90	4.0	21495	Open treatment of closed or open hyoid fracture	8.0	90
21432 Open treatment of craniofacial separation (LeFort III type); with wiring and/or local fixation	BR		4.0		(For treatment of fracture of larynx, see 31584-31586)		
				21497	Interdental wiring, for condition other than fracture	BR	3.0
				21499	Unlisted procedure, head	BR	3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-042, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-042, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-042, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-042, filed 11/30/81, effective 1/1/82; 80-18-055 (Order

80-25), § 296-22-042, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-042, filed 1/30/74.]

WAC 296-22-051 Neck (soft tissues) and thorax.

(For cervical spine, see 22100, et seq.)

(For injection of fracture site or trigger point, see 20550)

(For abdominal fascial transplant, see 22910)

INCISION

(For incision and drainage of abscess or hematoma, superficial, see 10060)

	Unit Value	Follow-up Days=	Basic Anes@
21501 Incision and drainage, deep abscess or hematoma;	5.0	30	3.0
21502 with partial rib osteotomy	6.0	30	3.0
21510 Incision, deep, with opening of bone cortex for osteomyelitis or bone abscess;	7.0	30	3.0

EXCISION

21550 Excisional biopsy, soft tissues ...	7.0	30	3.0
21555 Excision benign tumor; subcutaneous	7.0	30	3.0
21556 deep, subfascial, intramuscular	8.0	30	3.0

(For excision of chest wall tumor involving ribs, e.g., radical excision, see 19260, 19270)

21600 Excision of rib, partial	6.0	60	5.0
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(For radical resection of chest wall and rib cage for tumor, see 19260)

(For radical debridement of chest wall and rib cage for injury, see 11040-11044)

21610 Costotransversectomy (separate procedure)	BR		5.0
21615 Excision first and/or cervical rib for outlet compression syndrome or other cause;	16.6	60	
21616 with sympathectomy	BR		
21620 Osteotomy of sternum, partial ..	BR		5.0
21627 Sternal debridement	BR		5.0
21630 Radical resection of sternum for tumor;	BR		5.0
21632 with mediastinal lymphadenectomy	BR		5.0
21633 for osteomyelitis	BR		5.0

REPAIR, REVISION OR RECONSTRUCTION

(For superficial wound, see general section under Repair-Simple)

21700 Division of scalenus anticus; without resection of cervical rib ..	10.0	60	3.0
21705 with resection of cervical rib ..	12.0	60	5.0
21720 Division of sternocleidomastoid for torticollis, open operation; without cast application	8.0	60	3.0

(For transection of spinal accessory and cervical nerves, see 63191, 63192, 64722)

21725 with cast application	9.0	60	3.0
21740 Reconstructive repair of pectus excavatum or carinatum	26.0	120	11.0

FRACTURE AND/OR DISLOCATION

21800 Treatment of rib fracture; closed, uncomplicated, each	Sv. & BR		5.0
21805 open or complicated, each			
21810 closed or open requiring external fixation ("flail chest")	BR		5.0
21820 Treatment of sternum fracture; closed	Sv. & BR+		5.0
21825 open			

(For sternoclavicular dislocation, see 23520-23532)

MISCELLANEOUS

21899 Unlisted procedure, neck or thorax	BR		5.0
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[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-051, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-051, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-051, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-051, filed 1/30/74.]

WAC 296-22-053 Spine (vertebral column).

(Cervical, thoracic (dorsal), and lumbar spine)

(For injection procedure for myelography, see 63510-63520)

(For injection procedure for discography, see 63530-63535)

	Unit Value	Follow-up Days=	Basic Anes@
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EXCISION

22010 Biopsy, spinal soft tissues; superficial	1.2	7	3.0
22011 deep	2.4	15	3.0
22012* Biopsy, spinal soft tissues, percutaneous needle	BR		3.0

(For CT guidance, see 76360, 76361; for ultrasonic guidance, see 76942, 76943)

(For fine needle aspiration, preparation, and interpretation of smears, see 88170-88173)

22030 Excision, benign tumor, subcutaneous	3.0	15	3.0
22031 Excision, benign tumor, deep, subfascial, intramuscular; cervical	4.0	15	3.0
22032 thoracic	3.0	15	3.0
22033 lumbar	3.0	15	3.0

(For discectomy without arthrodesis (excision of intervertebral disc), see 63020-63076)

(For laminectomy, Gill procedure, see 63010)

	Unit Value	Follow-up Days=	Basic Anes@
22100 Partial resection of vertebral component, spinous processes (e.g., "kissing" spines); cervical .	8.0	90	8.0
22101 thoracic	8.0	90	7.0
22102 lumbar	8.0	90	7.0
22105 Partial resection of vertebral component for tumor (e.g., partial facetectomy without primary grafting); cervical	12.0	90	8.0
22106 thoracic	12.0	90	7.0
22107 lumbar	12.0	90	7.0
22110 Partial excision of vertebrae (craterization, saucerization) for osteomyelitis, cervical;	BR		8.0
22112 Partial excision of vertebrae (craterization, saucerization) for osteomyelitis, thoracic;	BR		7.0
22114 Partial excision of vertebrae (craterization, saucerization) for osteomyelitis, lumbar;	BR		7.0
22120 Radical resection of vertebral body or component with primary grafting, includes obtaining graft; cervical	BR		8.0
22121 thoracic	BR		7.0
22122 lumbar	BR		7.0
22128 Radical resection of vertebral body or component with prosthetic replacement, including fabrication of prosthesis; cervical	BR		7.0
22129 thoracic	BR		7.0
22130 lumbar	BR		7.0

(For repair of pseudarthrosis, see 22600-22735)

INTRODUCTION

(For injection procedure for myelography, see 62284)

(For injection procedure for diskography, see 62290, 62291)

(For injection procedure, chemonucleolysis, single or multiple levels, see 62292-62293)

REPAIR, REVISION, RECONSTRUCTION

22200 Osteotomy of spine for correction fixed deformity (not scoliosis); anterior OR posterior, lumbar . .	32.0	180	7.0
22201 thoracic or cervical	40.0	180	7.0
22202 Osteotomy of spine for correction fixed deformity (not scoliosis); anterior AND posterior, lumbar . .	40.0	180	7.0
22203 cervical	46.0	180	7.0
22206 Osteotomy of spine for correction fixed deformity, single or multiple (including vertebral body resection), for scoliosis with or without internal fixation; transthoracic	32.0	180	7.0
22207 transabdominal or retroperitoneal	40.0	180	7.0

(For primary arthrodesis without osteotomy in scoliosis, see 22800-22840)

22250 Prophylactic treatment (plating and/or wiring) with or without methyl methacrylate; lumbar spine	BR		
22251 cervical or thoracic spine	BR		

FRACTURE AND/OR DISLOCATION

	Unit Value	Follow-up Days=	Basic Anes@
22305 Treatment of vertebral process fracture, each	Sv.&		
22310 Treatment of vertebral body fracture and/or dislocation; without manipulation, each	Sv.&		
22315 with or without anesthesia by manipulation or traction, each	7.0	180	3.0
22325 Open treatment of vertebral body fracture and/or dislocation; lumbar, each	24.0	180	7.0
22326 cervical, each	24.0	180	8.0
22327 thoracic, each	24.0	180	7.0

Procedural codes 22330-22371 are for a SINGLE level procedure; for additional levels, see 22730-22735

22330 Open treatment and fusion, cervical spine, posterior approach, with local bone graft and/or internal fixation for fracture	28.0	180	10.0
22335 posterior approach, with iliac or other autogenous bone graft (includes obtaining graft), for fracture	31.0	180	10.0
22345 anterior approach, with iliac or other autogenous bone graft (includes obtaining graft) for fracture	30.0	180	8.0

(For cervicocranial fusion, see 22620)

22355 Open treatment and fusion, posterior approach, with local bone graft and/or internal fixation for fracture; lumbar	26.0	180	8.0
22356 thoracic	26.0	180	10.0
22360 Open treatment and fusion, posterior approach, with iliac or other autogenous bone graft (includes obtaining graft), for fracture; lumbar	30.0	180	8.0
22361 thoracic	30.0	180	10.0

22370 Open treatment and fusion, posterolateral or anterolateral approach, with iliac or other autogenous bone graft (includes obtaining graft) for fracture, lumbar	BR		8.0
22371 thoracic	BR		13.0
22379 Harrington rod technique (list separately in addition to code for treatment of closed or open fracture and/or dislocation)	BR		13.0

MANIPULATION

(22500 Manipulation of spine not requiring anesthesia has been deleted. To report, use 97260)

*22505 Manipulation of spine requiring anesthesia, any region	*1.4	0	5.0
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ARTHRODESIS WITH DISKECTOMY (Intervertebral disk excision, laminotomy or laminectomy and fusion)

Procedural codes 22550-22565 are for SINGLE level procedure; for additional levels, see 22730-22735.

	Unit Value	Follow-up Days=	Basic Anes@
(For diskectomy without arthrodesis, see 63020-63076)			
22550 Arthrodesis with diskectomy, cervical, posterior approach; local bone graft and/or internal fixation	28.0	180	10.0
22552 with iliac or other autogenous bone graft (includes obtaining graft)	32.0	180	10.0
22555 Arthrodesis with diskectomy, cervical, anterior interbody approach, with iliac or other autogenous bone graft (includes obtaining graft)	28.0	180	8.0

FOR THORACIC OR LUMBAR ARTHRODESIS WITH DISKECTOMY AND FUSION SEE CODES 22562 AND 22563

22560 Arthrodesis with diskectomy, lumbar or thoracic, posterior posterolateral or posterior interbody approach; local bone graft and/or internal fixation				NONCOVERED PROCEDURE
22561 with iliac or other autogenous bone graft (includes obtaining graft)				NONCOVERED PROCEDURE
22562 Arthrodesis with diskectomy, lumbar or thoracic, posterior or posterolateral, with local bone graft and/or internal fixation	26.0	180	8.0	
22563 Arthrodesis with diskectomy, lumbar or thoracic, posterior or posterolateral, with iliac or other autogenous graft (includes obtaining graft)	30.0	180	8.0	
22565 Arthrodesis with diskectomy, lower lumbar spine, anterior interbody approach, (includes obtaining graft)	24.0	180	8.0	
(For supplemental skills of two surgeons, see WAC 296-22-010, item 5b and modifier -62.)				

ARTHRODESIS, PRIMARY OR REPAIR OF PSEUDARTHROSIS

Procedural codes 22600-22720 are for SINGLE level procedures; for additional levels, see 22730-22735.

22600 Cervical fusion, posterior approach below C-1 level; local bone graft and/or internal fixation	24.0	180	8.0
22605 with iliac or other autogenous bone graft (includes obtaining graft)	28.0	180	8.0
22615 Cervical fusion, anterior approach (C3-T1) with iliac or other autogenous bone graft (includes obtaining graft)	28.0	180	8.0
22617 Atlas-axis fusion (C1-C2 or C3) with iliac or other autogenous bone graft (includes obtaining graft) (posterior or anterior approach)	29.0	180	8.0
22620 Cervicocranial fusion (occiput through C2) with iliac or other autogenous bone graft (includes obtaining graft)	30.0	180	8.0

	Unit Value	Follow-up Days=	Basic Anes@	
22640 Thoracic or lumbar fusion, posterior or posterolateral approach; local bone graft and/or internal fixation	24.0	180	8.0	
22645 with iliac or other autogenous bone graft (includes obtaining graft) (see also 22720)	28.0	180	8.0	
22655 Thoracic or lumbar fusion; posterior interbody technique, with iliac or other autogenous bone graft, (includes obtaining graft)				NONCOVERED PROCEDURE
22670 lateral approach (transverse process to transverse process and/or sacrum) with iliac or other autogenous bone graft and/or internal fixation (includes obtaining graft)				NONCOVERED PROCEDURE
22680 anterolateral or anterior interbody fusion, transthoracic approach (includes obtaining graft)	BR		11.0	
22700 Lumbar spine fusion, anterior interbody fusion (includes obtaining graft)	24.0	180	13.0	
(For supplemental skills of two surgeons, see WAC 296-22-010, item 5b and modifier -62.)				
22720 posterior approach, Harrington or Knodt rod distraction fusion, with iliac or other autogenous bone graft (includes obtaining graft)	30.0	180	13.0	
22730 Arthrodesis, primary or repair of pseudarthrosis, two levels (list separately in addition to code for single level arthrodesis, 22600-22720)	6.0		13.0	
22735 more than two levels (list separately in addition to code for single level arthrodesis, 22600-22720)	BR		13.0	

ARTHRODESIS, PRIMARY FOR SCOLIOSIS

(For single or multiple osteotomy type of scoliosis correction, see 22206, 22207)

22800 Arthrodesis, primary for scoliosis (with or without postoperative cast), 6 or less vertebrae; local bone graft	29.0	180	13.0
22801 with iliac or other autogenous bone graft	30.0	180	13.0
22802 Arthrodesis, primary for scoliosis (with or without postoperative cast) seven or more vertebrae; local bone graft	BR		13.0
22803 with iliac or other autogenous bone graft	BR		13.0

SPINAL INSTRUMENTATION

(List separately in addition to code for fracture dislocation, or arthrodesis of the spine, 22305-22803)

22840 Posterior instrumentation; without segmental fixation (e.g., Harrington rods technique)	50.0	180	13.0
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	Unit Value	Follow-up Days=	Basic Anes@
22842 segmental fixation (e.g., Luque technique)	BR		13.0
(For somatosensory testing, see 95925)			
22845 Anterior instrumentation (e.g., Dwyer instrumentation)	BR		7.0
22849 Reinsertion of spinal fixation device	BR		7.0
22850 Removal of posterior instrumentation (e.g., Harrington rod)	BR		8.0
22855 Removal of anterior instrumentation (e.g., Dwyer device)	BR		8.0
(For presurgical braces, Milwaukee or other, casts of any type, see section on application of casts or strapping)			
(For spinal cord monitoring, use 95925)			

MISCELLANEOUS

22899 Unlisted procedure, spine	BR		7.0
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[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-053, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-053, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-053, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-053, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-053, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-053, filed 1/30/74.]

WAC 296-22-061 Abdomen.

	Unit Value	Follow-up Days=	Basic Anes@
22900 Excision, abdominal wall tumor, subfascial (e.g., desmoid)	10.0	90	4.0
(22910 has been deleted; use 22999)			

MISCELLANEOUS

22999 Unlisted procedure, abdomen, musculoskeletal system	BR		5.0
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[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-061, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-061, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-061, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-061, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-061, filed 1/30/74.]

WAC 296-22-063 Shoulder.

	Unit Value	Follow-up Days=	Basic Anes@
(Clavicle, scapula, humerus head and neck, sternoclavicular joint, acromioclavicular joint and shoulder joint)			
INCISION			
23000 Removal of subdeltoid (or intratendinous) calcareous deposits	6.0	60	3.0
(For excision of subdeltoid bursa, see 23110)			
23020 Capsular contracture release (Sever type procedure) for Erb's palsy	11.0	60	3.0
(For incision and drainage procedures, superficial, see 10000-10160)			
23030 Incision and drainage; deep abscess or hematoma	BR		3.0
23031 infected bursa	BR		3.0
23035 Incision, deep, with opening of cortex for osteomyelitis or bone abscess;	BR		3.0
23040 Arthrotomy with exploration, drainage, or removal of foreign body, glenohumeral joint for infection	11.0	60	5.0
23044 Arthrotomy with exploration, drainage or removal of foreign body, acromioclavicular, sternoclavicular joint	10.0	60	5.0
EXCISION			
23065 Biopsy, soft tissues; superficial	1.2	7	3.0
23066 deep	2.4	15	3.0
23075 Excision, benign tumor; subcutaneous	3.0	7	3.0
23076 deep, subfascial or intramuscular	4.0	15	3.0
23100 Arthrotomy for biopsy, glenohumeral joint	11.0	60	3.0
23101 Arthrotomy for biopsy or for excision of torn cartilage, acromioclavicular, sternoclavicular joint	11.0	60	4.0
23105 Arthrotomy for synovectomy; glenohumeral joint	BR		5.0
23106 sternoclavicular joint	BR		4.0
(23110 has been deleted, use 23929)			
23120 Claviclectomy; partial	8.5	60	5.0
23125 total	16.0	60	5.0
23130 Acromiectomy, partial or total	8.5	60	5.0
23140 Excision or curettage of bone cyst or benign tumor of clavicle or scapula;	6.0	60	3.0
23145 with primary autogenous graft (includes obtaining graft)	9.0	120	3.0
23146 with homogenous or other nonautogenous graft	11.0	120	3.0
23150 Excision or curettage of bone cyst or benign tumor of proximal humerus;	6.0	120	3.0
23155 with primary autogenous graft (includes obtaining graft)	9.0	120	3.0
23156 with homogenous or other nonautogenous graft	11.0	120	3.0

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
23170	BR		3.0	23415			
23172	BR		3.0				
23174	BR		3.0	23420	6.5		5.0
23180	BR		3.0		18.0	120	5.0
23182	5.0	60	3.0	23430	12.0	90	5.0
23184	6.0	60	4.0	23440	12.0	90	5.0
23190	6.0	60	4.0	23450	17.0	90	5.0
23195	7.0	60	3.0	23455	19.0	90	5.0
23200	BR		3.0	23460	20.0	120	5.0
23210	BR		3.0	23462	18.0	120	5.0
23220	BR		3.0	23465	17.0	90	5.0
23221	BR		3.0				
23222	BR		3.0	23466	BR		3.0
INTRODUCTION OR REMOVAL				23470	20.0	120	6.0
				23472	BR		6.0
23330	8.0	60	3.0				
23331	11.0	60	3.0				
23332	BR		3.0	23480	10.0	90	3.0
23350	0.6	0	3.0	23485			
					13.0	120	3.0
				23490	BR		
				23491	BR		
REPAIR, REVISION OR RECONSTRUCTION				FRACTURE AND/OR DISLOCATION			
				23500	Sv. &		
				23505	3.0	90	3.0
23395	20.0	90	5.0	23510	5.0	90	3.0
23397	BR	90	5.0	23515			
23400	22.0	90	5.0		9.0	90	3.0
23405	7.0	60	5.0	23520	Sv. &		
23406	13.0	60	5.0		2.8	90	3.0
23410	14.0	120	5.0				
23412	16.0	120	5.0				

Surgical Fees

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	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
23530				ARTHRODESIS			
				23800			
23532	10.0	90	5.0				
				23802			
23540	12.0	90	5.0		20.0	120	5.0
23545	Sv.& 2.4	45	3.0	AMPUTATION			
23550				23900			
					24.0	90	11.0
23552	12.0	90	5.0	23920	18.0	90	5.0
23570	15.0	90	5.0	23921			
					5.0	30	3.0
23575	Sv.& 2.8	90	3.0	MISCELLANEOUS			
23580	5.0	90	3.0	23929	BR		5.0
23585	12.0	90	3.0	[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-063, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-063, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-063, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-063, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-063, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-063, filed 1/30/74.]			
23600	Sv.& 5.0	90	3.0	WAC 296-22-067 Humerus (upper arm) and elbow.			
23605				(Elbow area includes head and neck of radius and olecranon process.)			
23610	7.0	90	3.0	INCISION			
23615	12.0	90	3.0	(For incision and drainage procedures, superficial, see 10000-10160)			
23620	Sv.& 3.5	90	3.0		Unit Value	Follow-up Days=	Basic Anes@
23625				23930			
23630	9.0	90	3.0		5.0	15	3.0
					5.0	15	3.0
23650	Sv.& *1.2	0	3.0	23931			
*23655				23935			
23658	BR		3.0		8.0	15	3.0
				24000			
23660	12.0	90	3.0		10.0	60	3.0
23665	3.0	90	3.0	EXCISION			
23670	12.0	90	3.0	(For muscle or bone biopsy, see 20200-20245)			
				24065			
23675	4.0	90	3.0		2.0	7	3.0
23680	14.0	90	3.0	24066	3.0	15	3.0
				24075			
MANIPULATION					4.0	15	3.0
*23700	*1.2	0	4.0	24076	4.5	15	3.0
				24100			
					10.0	60	3.0
				24101			
					12.0	60	3.0
				24102	14.0	90	3.0
				24105	4.8	60	3.0
				24110	9.5	60	3.0
				24115			

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
graft (includes obtaining graft)	12.5	120	3.0	REPAIR, REVISION, AND RECONSTRUCTION			
24116 with homogenous or other nonautogenous graft	13.0	120	3.0				
24120 Excision or curettage of bone cyst or bone tumor of head or neck of radius or olecranon process	8.0	60	3.0	24301 Muscle or tendon transfer, any type, single (excluding 24320-24331)	BR		3.0
24125 with primary autogenous graft (includes obtaining graft)	10.0	120	3.0	24305 Tendon lengthening; single, each	7.0		3.0
24126 with homogenous or other nonautogenous graft	11.0	120	3.0	24310 Tenotomy, open, elbow to shoulder, single, each	5.0	30	3.0
24130 Excision, radial head	8.0	60	3.0	24320 Tenoplasty, with muscle transfer, with or without free graft, elbow to shoulder, single (Seddon-Brookes type procedure)	BR		3.0
(For replacement with implant, see 24366)				24330 Flexor-plasty, elbow (e.g., Steindler type advancement);	8.0	90	3.0
24134 Sequestrectomy (e.g., for osteomyelitis or bone abscess), shaft or distal humerus	BR		3.0	24331 with extensor advancement	8.0	90	3.0
24136 Sequestrectomy (e.g., for osteomyelitis or bone abscess), radial head or neck;	BR		3.0	24340 Tenodesis for rupture of biceps tendon at elbow	14.0	90	3.0
24138 Sequestrectomy (e.g., for osteomyelitis or bone abscess), olecranon process;	BR		3.0	24342 Reinsertion of ruptured biceps tendon, distal, with or without tendon graft (includes obtaining graft)	14.0	90	3.0
24140 Partial excision of bone (craterization, saucerization or diaphysectomy), (e.g., for osteomyelitis), humerus	7.0	60	3.0	24350 Fasciotomy, lateral or medial (e.g., "tennis elbow" or epicondylitis);	6.0	30	3.0
24145 Partial excision of bone (craterization, saucerization or diaphysectomy,) (e.g., for osteomyelitis), radial head or neck;	7.0	6.0	3.0	24351 with extensor origin detachment	5.0	30	3.0
24147 Partial excision of bone (craterization, saucerization or diaphysectomy) (e.g., for osteomyelitis), olecranon process;	7.0	60	3.0	24352 with annular ligament resection	6.0	30	3.0
24150 Radical resection for tumor, shaft or distal humerus;	BR		3.0	24354 with stripping	7.0		3.0
24151 with autogenous bone graft (includes obtaining graft)	BR		3.0	24356 with partial osteotomy	BR		3.0
24152 Radical resection for tumor, radial head or neck;	BR		3.0	24360 Arthroplasty, elbow, with membrane	BR		3.0
24153 with autogenous bone graft (includes obtaining graft)	BR		3.0	24361 with distal humeral prosthetic replacement	BR		3.0
24155 Resection of elbow joint (arthrectomy)	BR		3.0	24362 with implant and fascia lata ligament reconstruction	BR		3.0
INTRODUCTION OR REMOVAL				24363 with distal humerus and proximal ulnar prosthetic replacement ("total elbow")	BR		3.0
(For K wire or pin insertion or removal, see 20650, 20670, 20680)				24365 Arthroplasty, radial head;	10.0	120	3.0
(For arthrocentesis or needling of bursa or joint, see 20605)				24366 with implant	BR		3.0
24160 Implant removal; elbow joint	6.0	60	3.0	24400 Osteotomy, humerus, with or without internal fixation	12.0	90	3.0
24164 radial head	4.8	60	3.0	24410 Multiple osteotomies with realignment on intramedullary rod (Sofield type procedure)	14.0	90	3.0
24200 Removal of foreign body; subcutaneous	BR		3.0	24420 Osteoplasty, humerus (e.g., shortening or lengthening) (excluding 64876)	BR		3.0
24201 deep	BR		3.0	24430 Repair of nonunion or malunion, humerus; without graft (e.g., compression technique, etc.)	17.0	90	3.0
24220 Injection procedure for elbow arthrography	BR		3.0	24435 with iliac or other autogenous bone graft (includes obtaining graft)	20.0	120	3.0
(For elbow arthrography, see 73085)				(For proximal radius and/or ulna, see 25400-25420)			
(For injection of tennis elbow, see 20550)				24470 Hemiepiphyseal arrest (e.g., for cubitus varus or valgus, distal humerus)	7.0	120	3.0
				24495 Decompression fasciotomy, forearm, with brachial artery exploration	BR		3.0
				24498 Prophylactic treatment (nailing, pinning, plating or wiring) with or without methyl methacrylate; humerus	BR		

Surgical Fees

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		Unit	Follow-	Basic			Unit	Follow-	Basic
		Value	up	Anes@			Value	up	Anes@
			Days=					Days=	
FRACTURE AND/OR DISLOCATION									
24500	Treatment of closed humeral shaft fracture; without manipulation	Sv.&			24586	without internal or external skeletal fixation;	12.0	90	3.0
						with elbow resection	BR		3.0
					24587	with implant	BR		3.0
24505	with manipulation	5.0	90	3.0	(See also 24361)				
24506	percutaneous insertion of rod or pin	BR	90	3.0	24588	with implants and fascia lata ligament reconstruction	BR		3.0
24510	Treatment of open humeral shaft fracture, with uncomplicated soft tissue closure	7.0	90	3.0	(See also 24362)				
24515	Open treatment of closed or open humeral shaft fracture, with or without internal or external skeletal fixation	11.0	90	3.0	24600	Treatment of closed elbow dislocation; without anesthesia	Sv.&		
24530	Treatment of closed supracondylar or transcondylar fracture, without manipulation	Sv.&			*24605	requiring anesthesia	*1.0	0	3.0
24531	with traction (pin or skin)	BR		3.0	24610	Treatment of open elbow dislocation, with uncomplicated soft tissue closure	6.0	45	3.0
24535	Treatment of closed supracondylar or transcondylar fracture, with manipulation	5.0	90	3.0	24615	Open treatment of closed or open elbow dislocation	12.0	90	3.0
24536	with traction (pin or skin)	9.0	90	3.0	24620	Treatment of closed Monteggia type of fracture dislocation at elbow (fracture proximal end of ulna with dislocation of radial head)	4.0	90	3.0
24538	with percutaneous skeletal fixation	10.0	90	3.0	24625	Treatment of closed Monteggia type fracture dislocation at elbow (fracture proximal end of ulna with dislocation of the radial head), with uncomplicated soft tissue closure	6.0	90	3.0
24540	Treatment of open supracondylar or transcondylar fracture, with uncomplicated soft tissue closure;	7.0	90	3.0	24635	Open treatment of closed or open Monteggia type fracture dislocation at elbow (fracture proximal end of ulna with dislocation of radial head), with or without internal or external skeletal fixation	12.0	90	3.0
24542	with traction (pin or skin)	11.0	90	3.0	*24640	Treatment of radial head subluxation in child, "nursemaid elbow," with manipulation	Sv.&		
24545	Open treatment of closed or open supracondylar or transcondylar fracture, with or without internal or external skeletal fixation	10.0	90	3.0	24650	Treatment of closed radial head or neck fracture; without manipulation	Sv.&		
24560	Treatment of closed epicondylar fracture, medial or lateral; without manipulation	Sv.&			24655	with manipulation	3.0	90	3.0
24565	with manipulation	4.0	90	3.0	24660	Treatment of open radial head or neck fracture, with uncomplicated soft tissue closure	4.0	90	3.0
24570	Treatment of open epicondylar fracture, medial or lateral with uncomplicated soft tissue closure	6.0	90	3.0	24665	Open treatment of closed or open radial head or neck fracture, with or without internal fixation or radial head excision	8.0	90	3.0
24575	Open treatment of closed or open epicondylar fracture, medial or lateral, with or without internal or external skeletal fixation	9.0	90	3.0	24666	with implant	9.0	90	3.0
24576	Treatment of closed condylar fracture, medial or lateral; without manipulation	SV			24670	Treatment of closed ulnar fracture, proximal end (olecranon process); without manipulation	Sv.&		
24577	with manipulation	4.0	90	3.0		with manipulation	3.0	90	3.0
24578	Treatment of open condylar fracture, medial or lateral, with uncomplicated soft tissue closure	5.0	90	3.0	24675	Treatment of open ulnar fracture, proximal end (olecranon process), with uncomplicated soft tissue closure	4.0	90	3.0
24579	Open treatment of closed or open condylar fracture, medial or lateral, with or without internal or external skeletal fixation	7.0	90	3.0	24680	Open treatment of closed or open ulnar fracture proximal end (olecranon process), with or without internal or external skeletal fixation	8.0	90	3.0
24580	Treatment of closed comminuted elbow fracture (fracture distal humerus and/or proximal ulna and/or proximal radius), treatment with traction, (pin or skin); without manipulation	SV							
24581	with manipulation	8.0	90	3.0					
24583	Treatment of open comminuted elbow fracture (fracture distal humerus and/or proximal ulna and/or proximal radius), with uncomplicated soft tissue closure	9.0	90	3.0					
24585	Open treatment of closed or open comminuted elbow fracture (fracture distal humerus and/or proximal ulna/radius), with or								
MANIPULATION									
(24700 has been deleted; use 24999)									

	Unit Value	Follow-up Days=	Basic Anes@
ARTHRODESIS			
24800 Arthrodesis, elbow joint; with or without local or homogenous bone graft.....	16.0	120	3.0
24802 with primary autogenous bone graft (includes obtaining graft)	16.0	120	3.0
AMPUTATION			
24900 Amputation, arm through humerus; with primary closure	10.0	90	3.0
24920 open, circular (guillotine)	9.0	90	3.0
24925 secondary closure or scar revision	3.0	30	3.0
24930 reamputation	10.0	90	3.0
24931 with implant	10.0	90	3.0
24935 Stump elongation	3.0	90	3.0
24940 Cineplasty, upper extremity, complete procedure	BR		3.0

MISCELLANEOUS

24999 Unlisted procedure, humerus or elbow	BR		4.0
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[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-067, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-067, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-067, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-067, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-067, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-067, filed 1/30/74.]

WAC 296-22-071 Forearm and wrist.

	Unit Value	Follow-up Days=	Basic Anes@
(Radius, ulna, carpal bones and joints)			
INCISION			
25000 Tendon sheath incision; at radial styloid for De Quervain's disease	4.4	30	3.0
25005 at wrist for other stenosing tenosynovitis	4.0	30	3.0
(For decompression median nerve or for carpal tunnel syndrome, see 64721)			
25020 Decompression fasciotomy, flexor and/or extensor compartment; ..	3.5	30	3.0
25023 with debridement of nonviable muscle and/or nerve	4.0	30	3.0
(For decompression fasciotomy with brachial artery exploration, see 24495)			
(For incision and drainage procedures, superficial, see 10000-10160)			
25028 Incision and drainage; deep abscess or hematoma	1.0	30	3.0
25031 infected bursa	1.5	30	3.0
25035 Incision, deep, with opening of cortex for osteomyelitis or bone abscess;	2.0	30	3.0
25040 Arthrotomy with exploration, drainage, or removal of loose or			

	Unit Value	Follow-up Days=	Basic Anes@
foreign body, for infection, radiocarpal or mediocarpal joint;	5.0	60	3.0
EXCISION			
25065 Biopsy, soft tissues; superficial ..	2.0	7	3.0
25066 deep	3.0	15	3.0
25075 Excision, tumor; subcutaneous ..	4.0	15	3.0
25076 deep, subfascial or intramuscular	4.0	15	3.0
25085 Capsulotomy, wrist (e.g., for contracture)	4.0	15	3.0
25100 Arthrotomy, wrist joint, for biopsy	5.0	60	3.0
25101 with joint exploration, with or without biopsy, with or without removal of foreign body ..	7.0	60	3.0
25105 for synovectomy	8.0	90	3.0
25107 Arthrotomy, distal radioulnar joint for repair of triangular cartilage complex	9.0	60	3.0
25110 Excision, lesion of tendon sheath	3.0	30	3.0
25111 Excision of ganglion, wrist (dorsal or volar); primary	5.0	30	3.0
25112 recurrent	4.0	30	3.0
(For hand or finger, see 26160)			
25115 Radical excision of bursa synovia of wrist, or forearm tendon sheaths (e.g., tenosynovitis, fungus, Tbc., or other granulomas, rheumatoid arthritis); flexors ...	10.0	60	3.0
25116 extensors (with or without transposition of dorsal retinaculum)	10.0	60	3.0
(For finger synovectomies, see 26145)			
25118 Synovectomy, extensor tendon sheaths, wrist, single compartment;	10.0	60	3.0
25119 with resection of distal ulna ..	11.0	60	3.0
25120 Excision or curettage of bone cyst or benign tumor of radius or ulna (excluding head or neck of radius and olecranon process); ..	7.0	60	3.0
(For head or neck of radius or olecranon process, see 24120, 24126)			
25125 with primary autogenous graft (includes obtaining graft)	10.0	120	3.0
25126 with homogenous or other nonautogenous graft	10.0	120	3.0
25130 Excision or curettage of bone cyst or benign tumor of carpal bones	5.0	60	3.0
25135 with primary autogenous graft (includes obtaining graft)	7.0	120	3.0
25136 with homogenous or other nonautogenous graft	7.0	120	3.0
25145 Sequestrectomy for osteomyelitis or bone abscess;	BR		3.0
25150 Partial excision of bone (craterization, saucerization or diaphysectomy) (e.g., for osteomyelitis), ulna	5.0	60	3.0
25151 radius	5.0	60	3.0
(For head or neck of radius or olecranon process, see 24145-24148)			

Surgical Fees

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	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
25170 Radical resection for tumor, radius or ulna	BR		3.0	25316 with tendon(s) transfer	9.0	90	3.0
25210 Carpectomy, one bone	7.0	60	3.0	25317 Flexor origin slide for Volkmann contracture;	12.0	120	3.0
(For carpectomy with implant, see 25441-25445)				with tendon(s) transfer	13.0	120	3.0
25215 all bones of proximal row	10.0	60	3.0	25320 Capsulorrhaphy or reconstruction, capsulectomy, wrist (includes synovectomy, resection of capsule, tendon insertions)	21.1	120	3.0
25230 Radial styloidectomy (separate procedure)	5.0	60	3.0	25330 Arthroplasty, wrist	8.0	120	3.0
25240 Excision distal ulna (Darrach type procedure)	6.0	60	3.0	25331 with implant	BR		3.0
(For implant replacement, distal ulna, see 25442)				25332 pseudarthrosis type with internal fixation	BR		3.0
(For obtaining fascia for interposition, see 20920, 20922)				(For obtaining fascia for interposition, see 20920-20922)			
INTRODUCTION OR REMOVAL				25335 Centralization of wrist on ulna (e.g., radial club hand)	BR		
(For K wire, pin, or rod insertion or removal, see 20650, 20670, 20680)				25350 Osteotomy, radius, distal third	10.0	90	3.0
25246 Injection procedure for wrist arthrography	BR			25355 middle or proximal third	12.0	90	3.0
(For wrist arthrography, see 73115)				25360 Osteotomy, ulna	10.0	90	3.0
(For foreign body removal, superficial see 20520)				25365 radius and ulna	14.0	90	3.0
25248 Exploration for removal of deep foreign body	BR			25370 Multiple osteotomies, with realignment on intramedullary rod (Sofield type procedure), radius OR ulna	12.0	90	3.0
25250 Removal of wrist prosthesis; (separate procedure)	BR		3.0	25375 radius AND ulna	18.0	90	3.0
25251 complicated, including "total wrist"	BR		3.0	25390 Osteoplasty, radius OR ulna; shortening	BR+		3.0
				25391 lengthening with autogenous bone graft	BR		3.0
REPAIR, REVISION OR RECONSTRUCTION				25392 Osteoplasty, radius AND ulna; shortening (excluding 64876)	BR		3.0
25260 Repair, tendon or muscle, flexor; primary, single, each tendon or muscle	7.0	90	3.0	25393 lengthening with autogenous bone graft	BR		3.0
25263 secondary, single, each tendon or muscle	1.5	90	3.0	25400 Repair of nonunion or malunion, radius OR ulna; without graft (e.g., compression technique, etc.)	14.0	90	3.0
25265 secondary, with free graft (includes obtaining graft), each tendon or muscle	3.0	90	3.0	25405 with iliac or other autogenous bone graft (includes obtaining graft)	17.0	120	3.0
25270 Repair, tendon or muscle, extensor; primary, single, each tendon or muscle	5.0	90	3.0	25415 Repair of nonunion or malunion, radius AND ulna; without graft (e.g., compression technique, etc.)	20.0	90	3.0
25272 secondary, single, each tendon or muscle	1.5	90	3.0	25420 with iliac or other autogenous bone graft (includes obtaining graft)	23.0	120	3.0
25274 Repair, tendon or muscle, extensor, secondary, with tendon graft (includes obtaining graft), each tendon or muscle	8.0	90	3.0	25425 Repair of defect with autogenous bone graft; radius OR ulna	14.0	120	3.0
25280 Lengthening or shortening of flexor or extensor tendon, single, each tendon	7.0	90	3.0	25426 radius AND ulna	20.0	120	3.0
25290 Tenotomy, open, single, flexor or extensor tendon, each tendon	4.0	90	3.0	25440 Repair of nonunion, scaphoid (navicular) bone, with or without radial styloidectomy (includes obtaining graft and necessary fixation)	14.0	120	3.0
25295 Tenolysis, single flexor or extensor tendon, each tendon	1.0	90	3.0	25441 Arthroplasty with prosthetic replacement; distal radius	18.0	120	3.0
25300 Tenodesis, wrist; flexors of fingers	8.0	90	3.0	25442 distal ulna	12.5	120	3.0
25301 extensors of fingers	6.0	90	3.0	25443 scaphoid (navicular)	15.5	120	3.0
25310 Tendon transplantation or transfer, flexor or extensor, single, each tendon	9.5	90	3.0	25444 lunate	15.5	120	3.0
25312 with tendon graft(s) (includes obtaining graft), each tendon	8.0	90	3.0	25445 trapezium	15.5	120	3.0
25315 Flexor origin slide for cerebral palsy;	8.0	90	3.0	25446 distal radius and partial or entire carpus ("total wrist")	20.0	120	3.0
				25447 Interposition arthroplasty; intercarpal or carpometacarpal	BR	120	3.0
				25449 Revision of arthroplasty, including removal of implant	BR	120	3.0
				25450 Epiphyscal arrest by epiphysodesis or stapling; distal radius OR ulna	6.0	120	3.0
				25455 distal radius AND ulna	8.0	120	3.0

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
25490 Prophylactic treatment (nailing, pinning, plating or wiring) with or without methyl methacrylate; radius	BR			25626 Treatment of open carpal scaphoid (navicular) fracture, with uncomplicated soft tissue closure	5.0	90	3.0
25491 ulna	BR			25628 Open treatment of closed or open carpal scaphoid (navicular) fracture, with or without skeletal fixation	8.0	90	3.0
25492 radius and ulna	BR			25630 Treatment of closed carpal bone fracture (excluding carpal scaphoid (navicular)); without manipulation, each bone	Sv.&		
FRACTURE AND/OR DISLOCATION				25635 with manipulation, each bone	4.0	90	3.0
25500 Treatment of closed radial shaft fracture; without manipulation	Sv.&			25640 Treatment of open carpal bone fracture (excluding carpal scaphoid (navicular)); without manipulation, each bone	5.0	90	3.0
25505 with manipulation	4.2	90	3.0	25645 Open treatment of closed or open carpal bone fracture (excluding carpal scaphoid (navicular)), each bone	6.0	90	3.0
25510 Treatment of open radial shaft fracture, with uncomplicated soft tissue closure	5.0	90	3.0	25650 Treatment of closed ulnar styloid fracture	BR		3.0
25515 Open treatment of closed or open radial shaft fracture, with or without internal or external skeletal fixation	8.0	90	3.0	25660 Treatment of closed radiocarpal or intercarpal dislocation, one or more bones, with manipulation	1.2	0	3.0
25530 Treatment of closed ulnar shaft fracture; without manipulation	Sv.&			25665 Treatment of open radiocarpal dislocation or intercarpal, one or more bones, with uncomplicated soft tissue closure	4.0	45	3.0
25535 with manipulation	4.0	90	3.0	25670 Open treatment of closed or open radiocarpal or intercarpal dislocation, one or more bones	8.0	90	3.0
25540 Treatment of open ulnar shaft fracture with uncomplicated soft tissue closure	5.0	90	3.0	25675 Treatment of closed distal radioulnar dislocation with manipulation	3.2	60	3.0
25545 Open treatment of closed or open ulnar shaft fracture, with or without internal or external skeletal fixation	8.0	90	3.0	25676 Open treatment of closed or open distal radioulnar dislocation, acute or chronic	6.0	90	3.0
25560 Treatment of closed radial and ulnar shaft fractures; without manipulation	Sv.&			25680 Treatment of closed trans-scaphoperilunar type of fracture dislocation, with manipulation	6.0	45	3.0
25565 with manipulation	5.4	90	3.0	25685 Open treatment of closed or open trans-scaphoperilunar type of fracture dislocation	12.0	90	3.0
25570 Treatment of open radial and ulnar shaft fractures, with uncomplicated soft tissue closure	6.0	90	3.0	25690 Treatment of lunate dislocation, with manipulation	4.0	90	3.0
25575 Open treatment of closed or open radial and ulnar shaft fractures, with or without internal or external skeletal fixation	12.0	90	3.0	25695 Open treatment of lunate dislocation	8.0	90	3.0
25600 Treatment of closed distal radial fracture (e.g., Colles or Smith type) or epiphyseal separation, with or without fracture of ulnar styloid, without manipulation	Sv.&			MANIPULATION			
25605 with manipulation	4.0	90	3.0	(25700 has been deleted, use 25999)			
25610 Treatment of closed, complex, distal radial fracture (e.g., Colles or Smith type) or epiphyseal separation, with or without fracture of ulnar styloid, requiring manipulation; without external skeletal fixation or percutaneous pinning	6.0	90	3.0	ARTHRODESIS			
25611 percutaneous pinning or pins and plaster technique	8.0	120	3.0	25800 Arthrodesis, wrist joint, without bone graft	12.0	120	3.0
25615 Treatment of open distal radial fracture (e.g., Colles or Smith type) or epiphyseal separation, without fracture of ulnar styloid, with uncomplicated soft tissue closure	5.0	90	3.0	25805 with sliding graft	14.0	120	3.0
25620 Open treatment of closed or open distal radial fracture (e.g., Colles or Smith type) or epiphyseal separation, with or without fracture of the ulnar styloid, with or without internal or external skeletal fixation	8.0	90	3.0	25810 with iliac or other autogenous bone graft (includes obtaining graft)	16.0	120	4.0
25622 Treatment of closed carpal scaphoid (navicular) fracture; without manipulation	SV			25820 Intercarpal fusion, without bone graft	BR	120	3.0
25624 with manipulation	4.0	90	3.0	25825 with autogenous bone graft (includes obtaining graft)	BR	120	3.0
				AMPUTATION			
				25900 Amputation, forearm, through radius and ulna	9.0	90	3.0
				25905 open, circular (guillotine)	8.0	90	3.0

Surgical Fees

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	Unit Value	Follow-up Days=	Basic Anes@
25907 secondary closure or scar revision	3.0	30	3.0
25909 reamputation	9.0	90	3.0
25915 Krukenberg procedure	9.0	90	3.0
25920 Disarticulation through wrist ...	8.0	90	3.0
25922 secondary closure or scar revision	3.0	90	3.0
25924 reamputation	9.0	90	3.0
25927 Transmetacarpal amputation; ...	10.0	90	3.0
25929 secondary closure or scar revision	3.0	90	3.0
25931 reamputation	10.0	90	3.0

MISCELLANEOUS

25999 Unlisted procedure, forearm or wrist	BR		3.0
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[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-071, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-071, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-071, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-071, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-071, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-071, filed 1/30/74.]

WAC 296-22-073 Hand and fingers.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
(For drainage of paronychia, see 10100, 10101)			
*26010 Drainage of finger tip abscess; simple	*0.72	0	3.0
*26011 complicated (e.g., felon, etc.) ..	BR		3.0
26020 Drainage of tendon sheath, one digit and/or palm	4.0	30	3.0
(For drainage of simple abscess, see 10020, 10060)			
26025 Drainage of palmar bursa; single, ulnar or radial	5.0	30	3.0
26030 multiple or complicated	BR		3.0
26034 Incision, deep, with opening of cortex for osteomyelitis or bone abscess	4.0	30	3.0
26035 Decompression fingers and/or hand, injection injury (e.g., grease gun, etc.)	BR		
26040 Fasciotomy, palmar, for Dupuytren's contracture; closed (subcutaneous)	3.6	60	3.0
26045 open, partial	5.0	60	3.0
(For fasciotomy, see 26120-26128)			
26055 Tendon sheath incision for trigger finger	5.0	30	3.0
26060 Tenotomy, subcutaneous, single, each digit	1.2	0	3.0
26070 Arthrotomy, for infection, with exploration, drainage or removal of loose or foreign body; carpometacarpal joint	5.0	60	3.0
26075 metacarpophalangeal joint ...	5.0	60	3.0
26080 interphalangeal joint, each ...	4.0	60	3.0

EXCISION

	Unit Value	Follow-up Days=	Basic Anes@
(For finger nail, see 11700-11750)			
(For biopsy, see 20200-20240)			
(For neuroma, see 64200-64210)			
26100 Arthrotomy for synovial biopsy; carpometacarpal joint	5.0	60	3.0
26105 metacarpophalangeal joint ...	5.0	60	3.0
26110 interphalangeal joint, each ...	4.0	60	3.0
26115 Excision of benign tumor; subcutaneous	4.0	15	3.0
26116 deep, subfascial, intramuscular	4.0	30	3.0
26120 Fasciectomy palmer, simple, for Dupuytren's contracture, partial excision	6.0	60	3.0
26122 up to 1/2 palmar fascia, with single digit involvement, with or without Z-plasty or other local tissue rearrangement ...	10.0	60	3.0
(For fasciotomy, see 26040-26045)			
26124 Fasciectomy, palmar, complicated, requiring skin grafting (includes obtaining graft); with single digit involvement	14.0	90	3.0
26126 each additional digit	18.0	90	3.0
26128 each finger joint release	BR		
(For skin grafts, etc., see 14000-15240)			
26130 Synovectomy, carpometacarpal joint	10.0	90	3.0
26135 Synovectomy, metocarpophalangeal joint including intrinsic release and extensor hood reconstruction, each digit	5.0	90	3.0
26140 Synovectomy, proximal interphalangeal joint, including extensor reconstruction, each interphalangeal joint	5.0	90	3.0
26145 Synovectomy, tendon sheath, radical (tenosynovectomy), flexor, palm or finger, single, each digit	10.0	90	3.0
(For tendon sheath synovectomies at wrist, see 25115, 25116)			
26160 Excision of lesion of tendon sheath or capsule (e.g., cyst or ganglion)	2.4	30	3.0
(For wrist ganglion, see 25111, 25112)			
(For trigger digit, see 26055)			
26170 Excision of tendon, palm, flexor, single (independent procedure), each	BR		3.0
26180 Excision of tendon, finger, flexor (separate procedure)	BR		3.0
26200 Excision or curettage of bone cyst or benign tumor of metacarpal;	6.0	60	3.0
26205 with autogenous graft (includes obtaining graft)	7.0	120	3.0

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
26720				26843			
Treatment of closed phalangeal shaft fracture, proximal or middle phalanx, finger or thumb; without manipulation, each	Sv.&			Arthrodesis, carpometacarpal joint, digits, other than thumb;	8.0	120	3.0
26725	1.6	45	3.0	26844	10.0	120	3.0
with manipulation, each				with autogenous graft (includes obtaining graft)			
26727				26850	7.0	120	3.0
Treatment of unstable phalangeal shaft fracture, proximal or middle phalanx, finger or thumb, with manipulation, requiring traction or fixation, each	2.0	45	3.0	Arthrodesis metacarpophalangeal joint, with or without internal fixation			
26730				26852	8.0	120	3.0
Treatment of open phalangeal shaft fracture, proximal or middle phalanx, finger or thumb, with uncomplicated soft tissue closure, each	2.2	45	3.0	with autogenous graft (includes obtaining graft)			
26735				26860			
Open treatment of closed or open phalangeal shaft fracture, proximal or middle phalanx, finger or thumb, with or without internal or external skeletal fixation, each	4.0	60	3.0	Arthrodesis, interphalangeal joint, with or without internal fixation	5.0	120	3.0
26740				26861	4.0	120	3.0
Treatment of closed articular fracture, involving metacarpophalangeal or proximal interphalangeal joint; without manipulation, each	Sv.			each additional interphalangeal joint			
26742	2.0	60	3.0	26862	6.0	120	3.0
with manipulation, each				with autogenous graft (includes obtaining graft)			
26743	4.0	60	3.0	26863	5.0	120	3.0
with manipulation requiring traction for fixation, each				with autogenous graft (includes obtaining graft), each additional joint			
26744				AMPUTATION			
Treatment of open articular fracture, involving metacarpophalangeal or proximal interphalangeal joint, with uncomplicated soft tissue closure, each	1.5	60	3.0	(For hand through metacarpal bones, see 25927)			
26746				26910	7.0	90	3.0
Open treatment of closed or open articular fracture, involving metacarpophalangeal or proximal interphalangeal joint, each	6.0	60	3.0	Amputation, metacarpal, with finger or thumb (ray amputation), single, with or without interosseous transfer			
26750				(For repositioning, see 26550-26555)			
Treatment of closed distal phalangeal fracture, finger or thumb; without manipulation, each	Sv.&			26951			
26755	0.72	0	3.0	Amputation, finger or thumb, primary or secondary, any joint or phalanx, single, including neurectomies; with direct closure	3.5	45	3.0
with manipulation, each				26952	5.0	45	3.0
26756	BR		3.0	with local advancement flaps (V-Y, hood)			
with percutaneous pinning				(For repair of soft tissue defect requiring split or full thickness graft or other pedicle grafts, see 15050-15750)			
26760				MISCELLANEOUS			
Treatment of open distal phalangeal fracture, finger or thumb, with uncomplicated soft tissue closure, each	1.2	30	3.0	26989	BR		3.0
26765				Unlisted procedure, hands or fingers			
Open treatment of closed or open distal phalangeal fracture, finger or thumb, each	2.0	45	3.0	[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-073, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-073, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-073, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-073, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-073, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-073, filed 1/30/74.]			
26770	*0.72	0	3.0	WAC 296-22-079 Pelvis and hip joint.			
Treatment of closed interphalangeal joint dislocation, single, with manipulation; without anesthesia	1.2	45	3.0	(Including head and neck of femur)			
26775				INCISION			
requiring anesthesia				(For incision and drainage procedures, superficial, see 10000-10160)			
26780	1.6	45	3.0		Unit Value	Follow-up Days=	Basic Anes@
Treatment of open interphalangeal joint dislocation, single, with uncomplicated soft tissue closure				26990	BR		3.0
26785	2.4	60	3.0	Incision and drainage; deep abscess or hematoma			
Open treatment of closed or open interphalangeal joint dislocation, single				26991	BR		3.0
				infected bursa			
ARTHRODESIS							
26820	10.0	120	3.0				
Fusion in opposition, thumb, with autogenous graft (includes obtaining graft)							
26841	8.0	120	3.0				
Arthrodesis, carpometacarpal joint, thumb, with or without internal fixation;							
26842	10.0	120	3.0				
with autogenous graft (includes obtaining graft)							

Surgical Fees

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	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
26992	BR		3.0	27075	BR		5.0
27000	1.0	0	3.0	27076	BR		3.0
27001	3.0	45	3.0	27077	BR		3.0
27002	4.0	45	3.0	27078	BR		3.0
27003	5.0	45	3.0	27079	BR		3.0
27004	6.0	45	3.0	27080	6.0	90	3.0
27005	6.0	45	3.0	INTRODUCTION AND/OR REMOVAL			
27006	6.0	60	3.0	27086	BR		3.0
27010	6.0	45	3.0	27087	BR		3.0
27015	8.0	90	3.0	27090	14.0	90	3.0
27025	10.0	90	3.0	27091	BR		7.0
27026	12.0	90	3.0	27093	BR		3.0
27030	14.0	90	3.0	27095	BR		3.0
27033	16.0	90	3.0	(For hip arthrography, see 73525)			
27035	17.0	60	3.0	REPAIR, REVISION OR RECONSTRUCTION			
(For obturator neurectomy, see 64763-64768)				27097	BR		3.0
EXCISION				27098	BR		3.0
27040	1.2	7	3.0	27100	15.0	120	5.0
27041	2.4	15	3.0	27105	16.0	120	3.0
27047	3.0	7	3.0	27110	18.0	120	3.0
27048	4.0	15	3.0	27111	15.0	120	3.0
27050	6.0	90	3.0	(27115 has been deleted, use 27299)			
27052	14.0	90	3.0	27120	24.0	120	6.0
27054	20.0	90	3.0	27122	20.0	120	7.0
27060	5.0	60	3.0	27125	28.0	180	7.0
27062	4.0	60	3.0	27126	26.0	180	6.0
(For arthrocentesis or needling of bursa, see 20610)				27127	34.0	180	7.0
27065	5.0	120	3.0	27130	40.0	180	10.0
27066	9.5	120	3.0	27132	BR		7.0
27067	10.0	120	3.0	27134	BR		7.0
27070	6.0	60	3.0	27137	BR		7.0
27071	12.0	60	3.0	27138	BR		7.0
				27140	12.0	90	3.0
				27146	24.0	120	4.0
				27147	27.0	120	4.0
				27151	30.0	120	4.0
				27156			

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
27157 Acetabular augmentation (Wilson procedure)	BR	120	5.0	27224 Open treatment of closed or open acetabulum (hip socket) fracture(s), with or without internal or external fixation, simple	22.0	90	6.0
27158 Osteotomy, pelvis, bilateral for congenital malformation	BR		5.0	27225 complicated, intrapelvic approach	BR		10.0
27161 Osteotomy, femoral neck, (separate procedure)	20.0	120	3.0	27230 Treatment of closed femoral fracture, proximal end, neck; without manipulation	Sv.&		
27165 Osteotomy, intertrochanteric or subtrochanteric including internal or external fixation and/or cast	24.0	120	5.0	27232 with manipulation including skeletal traction	9.5	90	3.0
27170 Bone graft for nonunion, femoral head, neck, intertrochanteric or subtrochanteric area (includes obtaining bone graft)	24.0	120	6.0	27234 Treatment of open femoral fracture, proximal end, neck; with uncomplicated soft tissue closure, with manipulation (including skeletal traction)	12.0	90	3.0
27175 Treatment of slipped femoral epiphysis; by traction, without reduction	Sv.&			27235 Treatment of closed or open femoral fracture, proximal end, neck, in situ pinning of undisplaced or impacted fracture	20.0	180	4.0
27176 by single or multiple pinning, in situ	20.0	120	3.0	27236 Open treatment of closed or open femoral fracture, proximal end, neck, internal fixation or prosthetic replacement	22.0	120	6.0
27177 Open treatment of slipped femoral epiphysis; single or multiple pinning or bone graft (includes obtaining graft)	22.0	120	5.0	27238 Treatment of closed intertrochanteric, pertrochanteric or subtrochanteric femoral fracture; without manipulation	Sv.&		
27178 closed manipulation with single or multiple pinning	21.0	120	5.0	27240 with manipulation (including skeletal traction).	9.5	90	3.0
27179 osteoplasty of femoral neck (Heyman type procedure)	16.0	120	5.0	27242 Treatment of open intertrochanteric, pertrochanteric or subtrochanteric femoral fracture, with uncomplicated soft tissue closure (including traction)	12.0	90	3.0
27181 osteotomy and internal fixation	24.0	120	5.0	27244 Open treatment of closed or open intertrochanteric, pertrochanteric or subtrochanteric femoral fracture, with internal fixation	20.0	120	6.0
27185 Epiphyseal arrest by epiphysiodes or stapling, greater trochanter	5.0	120	3.0	27246 Treatment of closed greater trochanteric fracture, without manipulation	Sv.&		
27187 Prophylactic treatment (nailing, pinning, plating, or wiring) with or without methyl methacrylate, femoral neck and proximal femur	BR			27248 Open treatment of closed or open greater trochanteric fracture, with or without internal or external skeletal fixation	7.0	90	5.0
FRACTURES AND/OR DISLOCATIONS				27250 Treatment of closed hip dislocation, traumatic; without anesthesia	Sv.&		
27190 Treatment of closed sacral fracture	Sv.&			27252 requiring anesthesia	4.8	120	3.0
27192 Open treatment of closed or open sacral fracture	BR		3.0	27253 Open treatment of closed or open hip dislocation, traumatic, without internal fixation	15.0	180	5.0
27195 Treatment of sacroiliac and/or symphysis pubis dislocation, without manipulation	Sv.&			27254 Open treatment of closed or open hip dislocation, traumatic, with acetabular lip fixation, with or without internal or external skeletal fixation;	17.0	120	5.0
27196 Treatment of sacroiliac and/or symphysis pubis dislocation, with anesthesia and with manipulation	BR		3.0	27255 complicated or late	22.0	180	5.0
27200 Treatment of closed coccygeal fracture	Sv.&			*27256 Treatment of congenital hip dislocation, by abduction, splint or traction; any method	Sv.&		3.0
27201 Treatment of open coccygeal fracture	BR		3.0	*27257 with manipulation requiring anesthesia	4.5	45	3.0
27202 Open treatment of closed or open coccygeal fracture	BR		3.0	27258 Open treatment of congenital hip dislocation; replacement of femoral head in acetabulum (including tenotomy, etc.)	17.0	120	5.0
27210 Treatment of closed iliac, pubic or ischial fracture				27259 with femoral shaft shortening	BR	120	5.0
27212 Treatment of open iliac, pubic or ischial fracture, with uncomplicated soft tissue closure	Sv.&		3.0				
27214 Open treatment of closed or open iliac, pubic or ischial fracture, with or without internal skeletal fixation	BR		4.0				
(for external fixation, see 20690-20691)							
27220 Treatment of closed acetabulum (hip socket) fracture(s); without manipulation	Sv.&						
27222 with manipulation with or without skeletal traction	8.0	90	3.0				

Surgical Fees

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Unit Follow-up Basic
Value Days= Anes@

MANIPULATION

*27275 Manipulation, hip joint, requiring general anesthesia *1.2 0 3.0

ARTHRODESIS

27280 Arthrodesis, sacroiliac joint (including obtaining graft) 14.0 120 5.0
(27281 has been deleted, use 27280 and bilateral modifier -50)
27282 Arthrodesis, symphysis pubis (including obtaining graft) BR 4.0
27284 Arthrodesis, hip joint (including obtaining graft); 24.0 180 5.0
27286 with subtrocantalic osteotomy 26.0 180 5.0

AMPUTATION

27290 Interpelviabdominal amputation (hind quarter amputation) 29.0 120 11.0
27295 Disarticulation of hip 24.0 120 8.0

MISCELLANEOUS

27299 Unlisted procedure, pelvis or hip joint BR 7.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-079, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-079, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-079, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-079, filed 1/30/74.]

WAC 296-22-082 Femur (thigh region) and knee joint.

(Including tibial plateaus)

Unit Follow-up Basic
Value Days= Anes@

INCISION

(For incision and drainage of abscess or hematoma, superficial, see 10000-10160)
27301 Incision and drainage of deep abscess, infected bursa, or hematoma BR 3.0
27303 Incision, deep, with opening of bone cortex (e.g., for osteomyelitis or bone abscess) BR 3.0
27305 Fasciotomy, iliotibial (tenotomy), open 6.0 45 3.0
(For combined Ober-Yount fasciotomy, see 27025-27026)
27306 Tenotomy, subcutaneous, closed, adductor or hamstring, (separate procedure); single 1.2 60 3.0
multiple 4.0 60 3.0
27310 Arthrotomy, knee, for infection, with exploration, drainage or removal of foreign body 12.0 90 3.0
27315 Neurectomy, hamstring muscle .. 11.0 30 3.0
27320 Neurectomy, popliteal (gastrocnemius) 11.0 30 3.0

EXCISION

27323 Biopsy, soft tissues; superficial ... 1.2 7 3.0
27324 deep 2.4 15 3.0
27327 Excision, benign tumor; subcutaneous 3.0 7 3.0
27328 deep, subfascial, or intramuscular 4.0 15 3.0
27330 Arthrotomy, knee; for synovial biopsy only 12.0 90 3.0
27331 with joint exploration, with or without biopsy, with or without removal of loose bodies 13.0 90 3.0
27332 Arthrotomy, knee, for excision of semilunar cartilage (meniscectomy); medial OR lateral 14.0 90 3.0
medial AND lateral 20.0 90 3.0
27334 Arthrotomy, knee, for synovectomy; anterior OR posterior 17.0 120 3.0
27335 anterior AND posterior including popliteal area 14.0 120 3.0
27340 Excision, prepatellar bursa 5.0 60 3.0
27345 Excision of synovial cyst of popliteal space (Baker's cyst) 8.0 60 3.0
27350 Patellectomy or hemipatellectomy 12.0 90 3.0
27355 Excision or curettage of bone cyst or benign tumor of femur 11.0 60 3.0
with homogenous graft 12.0 60 3.0
27357 with primary autogenous graft (includes obtaining graft) 14.0 120 3.0
27358 with internal fixation (list in addition to 27355, 27356, or 27357) 15.0 120 3.0
27360 Partial excision of bone, (craterization, saucerization or diaphysectomy), for (e.g., osteomyelitis, femur, proximal tibia and/or fibula); 10.0 60 3.0
27365 Radical resection for tumor (bone or soft tissue) BR+ 3.0

INTRODUCTION AND/OR REMOVAL

27370 Injection procedure for knee arthrography 0.6 0
(For knee arthrography, see 73580, 73581)
27372 Removal foreign body, deep BR
(For removal of knee prosthesis including total knee, see 27488)
(27373-27379 have been deleted, see 29870-29887)

REPAIR, REVISION OR RECONSTRUCTION

27380 Suture of infrapatellar tendon; primary 11.0 90 3.0
27381 secondary reconstruction, including fascial or tendon graft . BR
27385 Suture of quadriceps or hamstring muscle rupture; primary 13.0 90 3.0
27386 secondary reconstruction, including fascial or tendon graft . 15.0 90 3.0
27390 Tenotomy, open, hamstring, knee to hip; single 6.0 45 3.0
multiple, one leg 6.0 90 3.0
27392 multiple, bilateral 8.0 45 3.0
27393 Lengthening of hamstring tendon; single 8.0 90 3.0
27394 multiple, one leg 12.0 90 3.0
27395 multiple, bilateral 16.0 120 3.0

Surgical Fees

296-22-087

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
27508 Treatment of closed femoral fracture, distal end, medial or lateral condyle; without manipulation . . .	Sv.& 8.0	90	3.0	27566 Open treatment of closed or open patellar dislocation, with or without partial or total patellectomy . . .	12.0	90	3.0
27510 with manipulation				MANIPULATION			
27512 Treatment of open femoral fracture, distal end, medial or lateral condyle, with uncomplicated soft tissue closure	12.0	90	3.0	*27570 Manipulation of knee joint under general anesthesia (includes application of traction or other fixation devices)	*1.2	0	3.0
27514 Open treatment of closed or open femoral fracture, distal end, medial or lateral condyle, with or without internal or external skeletal fixation	20.0	90	4.0	ARTHRODESIS			
27516 Treatment of closed distal femoral epiphyseal separation; without manipulation (includes traction) . .	SV			27580 Fusion of knee, any technique . . .	20.0	120	3.0
27517 with manipulation	7.0	120	3.0	AMPUTATION			
27518 Treatment of open distal femoral epiphyseal separation, with uncomplicated soft tissue closure . . .	8.0	120	3.0	27590 Amputation, thigh, through femur, any level;	14.5	120	4.0
27519 Open treatment of closed or open distal femoral epiphyseal separation, with or without internal or external skeletal fixation	18.0	120	4.0	27591 immediate fitting technique including first cast	BR	30	3.0
27520 Treatment of closed patellar fracture, without manipulation	Sv.&			27592 open, circular (guillotine)	14.0	120	4.0
27522 Treatment of open patellar fracture, with uncomplicated soft tissue closure	4.0	90	3.0	27594 secondary closure or scar revision	Sv.&		3.0
27524 Open treatment of closed or open patellar fracture, with repair and/or excision	12.0	90	3.0	27596 reamputation	BR+		4.0
27530 Treatment of closed tibial fracture, proximal (plateau); without manipulation	Sv.&			27598 Disarticulation at knee	14.0	120	4.0
27532 with manipulation	5.0	90	3.0	MISCELLANEOUS			
27534 Treatment of open tibial fracture, proximal (plateau), with uncomplicated soft tissue closure	8.0	90	3.0	27599 Unlisted procedure, femur or knee	BR		4.0
27536 Open treatment of closed or open tibial fracture, proximal (plateau), with or without internal or external skeletal fixation;	14.0	90	3.0	[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-082, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-082, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-082, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-082, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-082, filed 12/3/80, effective 3/1/81; Order 76-34, § 296-22-082, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-22-082, filed 11/28/75, effective 1/1/76; Order 74-7, § 296-22-082, filed 1/30/74.]			
27537 with autogenous graft (includes obtaining graft)	16.0	120	3.0	WAC 296-22-087 Leg (tibia and fibula) and ankle joint.			
27538 Treatment of closed intercondylar spine(s) fracture(s)	Sv.&				Unit Value	Follow-up Days=	Basic Anes@
27540 Open treatment of closed or open intercondylar spine(s) fractures(s), with internal fixation	14.0	90	3.0	INCISION			
27550 Treatment of closed knee dislocation; without anesthesia	Sv.&			27600 Fasciotomy, leg, anterior compartment only, for closed space decompression;	5.0	30	3.0
27552 requiring anesthesia	3.6	45	3.0	27601 posterior compartment only . .	BR	30	3.0
27554 Treatment of open knee dislocation, with uncomplicated soft tissue closure	7.0	45	3.0	27602 anterior and posterior compartments	7.0	30	3.0
27556 Open treatment of closed or open knee dislocation, with or without internal or external skeletal fixation; without primary ligamentous repair	15.0	90	3.0	(For incision and drainage procedures, superficial, see 10000-10160)			
27557 with primary ligamentous repair	BR	120	3.0	27603 Incision and drainage; deep abscess or hematoma	BR		
27560 Treatment of closed patellar dislocation; without anesthesia	Sv.&			27604 infected bursa	SV		
(For recurrent dislocation, see 27420-27424)				*27605 Tenotomy, Achilles tendon, subcutaneous (separate procedure); local anesthesia	1.0	0	3.0
27562 requiring anesthesia	3.6	45	3.0	27606 general anesthesia	2.0	0	
27564 Treatment of open patellar dislocation, with uncomplicated soft tissue closure	5.0	45	3.0	27607 Incision, deep, with opening of bone cortex for osteomyelitis or bone abscess;	BR		3.0
				27610 Arthrotomy, ankle, for infection with exploration, drainage or removal of loose or foreign body; . .	9.0	60	3.0

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
27612 Arthrotomy, ankle, posterior capsular release, with or without Achilles tendon lengthening (see also 27685)	10.0	60	3.0	27680 Tenolysis, including tibia, fibula and ankle flexor, single	5.0	60	3.0
(See also 27685)				27681 multiple (through same incision), each	6.0	60	3.0
EXCISION				27685 Lengthening or shortening of tendon; single (separate procedure)	7.0	90	3.0
27613 Biopsy, soft tissues; superficial . .	1.2	7	3.0	27686 multiple (through same incision), each	8.0	120	3.0
27614 deep	2.4	15	3.0	27687 Gastrocnemius recession (e.g., Strayer procedure)	7.0	120	3.0
27618 Excision, benign tumor; subcutaneous	3.0	7	3.0	(Toe extensors are considered as a group to be a single tendon when transplanted into midfoot)			
27619 deep, subfascial or intramuscular	4.0	15	3.0	27690 Transfer or transplant of single tendon (with muscle redirection or rerouting); superficial (e.g., anterior tibial extensors into midfoot)	8.0	120	3.0
27620 Arthrotomy (capsulotomy), ankle, for biopsy	9.0	60	3.0	27691 anterior tibial or posterior tibial through interosseous space	10.0	120	3.0
27625 Arthrotomy, ankle, for synovectomy;	12.0	90	3.0	each additional tendon	2.0		
27626 including tenosynovectomy	14.0	90	3.0	27695 Suture, primary, torn, ruptured or severed ligament, ankle; collateral	10.0	120	3.0
27630 Excision of lesion of tendon, sheath or capsule (e.g., cyst or ganglion, etc.)	3.6	30	3.0	27696 both collateral ligaments	14.0	120	3.0
27635 Excision, or curettage, of bone cyst or benign tumor, tibia or fibula;	10.0	60	3.0	27698 Suture, secondary repair, torn, ruptured or severed ligament; ankle, collateral (e.g., Watson-Jones procedure)	14.0	120	3.0
27637 with primary autogenous graft (includes obtaining graft)	13.0	120	3.0	27700 Arthroplasty, ankle;	BR		3.0
27638 with primary homogenous graft	14.0	120	3.0	27702 with implant ("total ankle")	BR		3.0
27640 Excision of bone, partial, (craterization, saucerization or diaphysectomy) for osteomyelitis; tibia	12.0	60	3.0	27703 secondary reconstruction, total ankle	BR		3.0
27641 fibula	10.0	60	3.0	27704 Removal of ankle implant	BR		
27645 Resection for tumor, radical; tibia	BR		3.0	27705 Osteotomy; tibia	12.0	90	3.0
27646 fibula	BR		3.0	27707 fibula	7.0	90	3.0
27647 talus or calcaneus	BR		3.0	27709 tibia and fibula	14.0	90	3.0
INTRODUCTION OR REMOVAL				27712 multiple, with realignment on intramedullary rod (Sofield type procedure)	18.0	90	3.0
27648 Injection procedure for ankle arthrography	BR			(For osteotomy to correct genu varus (bowleg) or genu valgus (knock-knee), see 27455-27462)			
(For ankle arthrography, see 73615)				27715 Osteoplasty, tibia and fibula, lengthening	24.0	90	3.0
(For ankle arthroscopy, see 27850-27853)				27720 Repair of nonunion or malunion, tibia, without graft (e.g., compression technic, etc.)	18.0	90	3.0
REPAIR, REVISION OR RECONSTRUCTION				27722 with sliding graft	20.0	120	3.0
27650 Repair, primary, open or percutaneous, ruptured Achilles tendon	11.0	120	3.0	27724 with iliac or other autogenous bone graft (includes obtaining graft)	22.0	120	3.0
27652 with graft (includes obtaining graft)	14.0	120	3.0	27725 by synostosis, with fibula, any method	BR	120	3.0
27654 Repair, secondary, ruptured Achilles tendon, with or without graft	14.0	120	3.0	27727 Repair of congenital pseudarthrosis, tibia	BR	120	3.0
27656 Repair, fascial defect of leg	6.0	45	3.0	27730 Epiphyseal arrest by epiphysiodesis or stapling, distal tibia	12.0	120	3.0
27658 Repair or suture of flexor tendon of leg; primary, without free graft, single, each	6.0	90	3.0	distal fibula	6.0	120	3.0
27659 secondary with or without free graft, single tendon, each	8.0	90	3.0	27734 distal tibia and fibula	14.0	120	3.0
27664 Repair or suture of extensor tendon of leg; primary, without free graft, single, each	4.0	90	3.0	27740 Epiphyseal arrest by epiphysiodesis or stapling, combined, proximal and distal tibia and fibula;	18.0	120	3.0
27665 secondary with or without free graft, single tendon, each	6.0	90	3.0	and distal femur	22.0	120	3.0
27675 Repair for dislocating peroneal tendons; without fibular osteotomy	5.0	90	3.0	(For epiphyseal arrest of proximal tibia and fibula, see 27477)			
27676 with fibular osteotomy	6.0	90	3.0				

Surgical Fees

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	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
27745 Prophylactic treatment (nailing, pinning, plating or wiring), with or without methyl methacrylate, tibia	BR			27816 Treatment of closed trimalleolar ankle fracture; without manipulation	Sv.&		
				27818 with manipulation	6.0	90	3.0
				27820 Treatment of open trimalleolar ankle fracture, with uncomplicated soft tissue closure	7.0	90	3.0
FRACTURES AND/OR DISLOCATIONS				27822 Open treatment of closed or open trimalleolar ankle fracture, with or without internal or external skeletal fixation, medial and/or lateral malleolus; only	14.5	90	3.0
27750 Treatment of closed tibial shaft fracture; without manipulation	Sv.&			27823 including internal skeletal fixation of posterior lip (malleolus)	18.0	120	3.0
27752 with manipulation	5.0	90	3.0	27830 Treatment of proximal tibiofibular joint dislocation; without anesthesia	Sv.&		
27754 Treatment of open tibial shaft fracture, with uncomplicated soft tissue closure	6.5	90	3.0	27831 requiring anesthesia	BR		3.0
27756 Open treatment of closed or open tibial shaft fracture, with internal skeletal fixation; simple	12.0	90	3.0	27832 Open treatment of proximal tibiofibular joint dislocation with fixation or excision	8.0	90	3.0
27758 complicated	17.9	120	3.0	27840 Treatment of ankle dislocation; without anesthesia	Sv.&		
27760 Treatment of closed distal tibial fracture (medial malleolus); without manipulation	Sv.&			*27842 requiring anesthesia	*2.0	45	3.0
27762 with manipulation	3.0	90	3.0	27844 Treatment of open ankle dislocation, with uncomplicated soft tissue closure	3.2	45	3.0
27764 Treatment of open distal tibial fracture (medial malleolus) with uncomplicated soft tissue closure	4.4	90	3.0	27846 Open treatment of closed or open ankle dislocation	12.0	90	3.0
27766 Open treatment of closed or open distal tibial fracture (medial malleolus), with fixation	9.0	90	3.0	27848 with fixation	9.0	90	3.0
27780 Treatment of closed proximal fibula or shaft fracture; without manipulation	Sv.&			ARTHROSCOPY			
27781 with manipulation	3.0	90	3.0	(27850 has been deleted, use 29890)			
27782 Treatment of open proximal fibula or shaft fracture, with uncomplicated soft tissue closure	4.0	90	3.0	(27851-27853 have been deleted, use 29890-29898)			
27784 Open treatment of closed or open proximal fibula or shaft fracture, with or without internal or external skeletal fixation	8.0	90	3.0	MANIPULATION			
27786 Treatment of closed distal fibular fracture (lateral malleolus); without manipulation	Sv.&			*27860 Manipulation of ankle under general anesthesia (includes application of traction or other fixation apparatus)	*1.0	0	3.0
27788 with manipulation	3.0	90	3.0	ARTHRODESIS			
27790 Treatment of open distal fibular fracture (lateral malleolus), with uncomplicated soft tissue closure	4.0	90	3.0	27870 Arthrodesis, ankle any method	17.0	120	3.0
27792 Open treatment of closed or open distal fibular fracture (lateral malleolus), with fixation	9.0	90	3.0	27871 Arthrodesis, tibiofibular joint, proximal or distal	BR	120	3.0
27800 Treatment of closed tibia and fibula fractures, shafts; without manipulation	Sv.&			AMPUTATION			
27802 with manipulation	6.5	90	3.0	27880 Amputation, leg, through tibia and fibula;	12.0	90	4.0
27804 Treatment of open tibia and fibula fractures, shafts, with uncomplicated soft tissue closure (e.g., "pins above and below")	8.0	90	3.0	27881 with immediate fitting technique including application of first cast	12.0	90	4.0
27806 Open treatment of closed or open tibia and fibula fractures, shafts, with or without internal or external skeletal fixation	14.5	90	3.0	27882 open, circular (guillotine)	10.5	90	4.0
27808 Treatment of closed bimalleolar ankle fracture, (including Potts); without manipulation	Sv.&			*27884 secondary closure or scar revision	*Sv.&		3.0
27810 with manipulation	5.0	90	3.0	27886 reamputation	BR		4.0
27812 Treatment of open bimalleolar ankle fracture, with uncomplicated soft tissue closure	6.5	90	3.0	27888 Amputation, ankle, through malleoli of tibia and fibula (Syme, Pirogoff type procedures), with plastic closure and resection of nerves	12.0	90	3.0
27814 Open treatment of closed or open bimalleolar ankle fracture, with or without internal skeletal fixation	12.0	90	3.0	27889 Ankle disarticulation	12.0	120	3.0
				MISCELLANEOUS			
				27899 Unlisted procedure, leg or ankle	BR		4.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-087, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-087, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-087, filed 8/2/83. Statutory Authority: RCW

51.04.020(4), 51.04.030, and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-087, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-087, filed 1/30/74.]

WAC 296-22-091 Foot.

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
				foot	3.6	30	3.0
				28092 toes	2.4	30	3.0
				28100 Excision or curettage of bone cyst or benign tumor, talus or calcaneus;	6.0	60	3.0
				28102 with iliac or other autogenous bone graft (includes obtaining graft)	7.0	120	3.0
				28103 with homogenous bone graft	8.0	120	3.0
				28104 Excision or curettage of bone cyst or benign tumor, tarsal or metatarsal bones, except talus or calcaneus;	4.8	60	3.0
				28106 with iliac or other autogenous bone graft (includes obtaining graft)	5.6	120	3.0
				28107 with homogenous bone graft	6.6	120	3.0
				28108 Excision or curettage of bone cyst or benign tumor, phalanges;	3.6	60	3.0
				(For ostectomy, partial (e.g., hallux valgus, Silver type procedure) see 28290)			
				(28109 has been deleted, see 28899)			
				28110 Ostectomy, partial excision, fifth metatarsal head (bunionette) (separate procedure)	2.4	60	3.0
				28111 Ostectomy; complete excision of first metatarsal head	7.0	90	3.0
				28112 other metatarsal head (second, third or fourth)	4.0	60	3.0
				28113 fifth metatarsal head	1.0	90	3.0
				28114 all metatarsal heads with proximal phalangectomy excluding first metatarsal head (Clayton type procedure)	12.0	60	3.0
				28116 Ostectomy, excision of tarsal coalition	7.0	60	3.0
				28118 Ostectomy, calcaneus; partial	7.0	60	3.0
				28119 for spur, with or without plantar fascial release	BR		3.0
				28120 Partial excision of bone (craterization, saucerization, sequestrectomy, or diaphysectomy) for osteomyelitis, talus or calcaneus;	6.0	60	3.0
				28122 Partial excision of bone (craterization, saucerization or diaphysectomy) for osteomyelitis, tarsal or metatarsal bone, except talus or calcaneus;	4.8	60	3.0
				28124 Partial excision of bone (craterization, saucerization, or diaphysectomy) for osteomyelitis, phalanx	3.6	60	3.0
				28126 Condylectomy, phalangeal base, single toe, each	8.0	60	3.0
				28130 Talectomy (astragalectomy)	10.0	120	3.0
				28135 Calcanectomy	10.0	120	3.0
				28140 Metatarsectomy	6.0	60	3.0
				28150 Phalangectomy, single, each	3.6	30	3.0
				28153 Resection, head of phalanx	6.0	30	3.0
				28160 Hemiphalangectomy or interphalangeal joint excision, single, each	3.0	30	3.0
				28171 Radical resection for tumor; tarsal (except talus or calcaneus)	BR		3.0
				28173 metatarsal	BR		3.0
				28175 phalanx	BR		3.0
				(For talus or calcaneus, see 27647)			
INCISION							
(For incision and drainage procedures, superficial, see 10000-10160)							
*28001 Incision and drainage, infected bursa	SV						
*28002 Deep infection, below fascia, requiring deep dissection, with or without tendon sheath involvement; single bursal space, specify	BR		3.0				
28003 multiple areas	BR		3.0				
28005 Incision, deep, with opening of bone cortex for osteomyelitis or bone abscess;	BR		3.0				
28008 Fasciotomy, plantar and/or toe, subcutaneous (see also 28060, 28062, 28250)	2.4	60	3.0				
28010 Tenotomy, subcutaneous, toe; single	*0.8	0	3.0				
28011 multiple	*1.2	0	3.0				
(For open tenotomy, see 28230, 28234)							
28020 Arthrotomy, with exploration, drainage or removal of loose or foreign body; intertarsal or tarsometatarsal joint	6.0	60	3.0				
28022 metatarsophalangeal joint	3.6	60	3.0				
28024 interphalangeal joint	2.4	60	3.0				
28030 Neurectomy of intrinsic musculature of foot	BR		3.0				
28035 Tarsal tunnel release (posterior tibial nerve decompression)	8.0	60	3.0				
EXCISION							
(For toenail, see 11730-11750)							
28043 Excision, benign tumor; subcutaneous	3.0	7	3.0				
28045 deep, subfascial, intramuscular	4.0	15	3.0				
28050 Arthrotomy for synovial biopsy; intertarsal or tarsometatarsal joint	6.0	60	3.0				
28052 metatarsophalangeal joint	3.6	60	3.0				
28054 interphalangeal joint	2.4	60	3.0				
28060 Faciectomy, excision of plantar fascia; partial (separate procedure)	6.0	60	3.0				
28062 radical (separate procedure)	BR		3.0				
(For plantar fasciotomy, see 28008, 28250)							
28070 Synovectomy, intertarsal or tarsometatarsal joint, each	6.0	90	3.0				
28072 metatarsophalangeal joint, each	3.6	90	3.0				
28080 Excision of Morton neuroma, single, each	3.6	30	3.0				
28086 Synovectomy, tendon sheath; flexor	6.0	90	3.0				
28088 extensor	6.0	90	3.0				
28090 Excision of lesion of tendon or fibrous sheath or capsule (including synovectomy) (cyst or ganglion);							

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		Unit	Follow-	Basic			Unit	Follow-	Basic
		Value	up	Anes@			Value	up	Anes@
			Days=					Days=	
INTRODUCTION AND/OR REMOVAL									
*28190	Remove foreign body; subcutaneous	BR		3.0					
28192	deep	BR		3.0					
28193	complicated	BR		3.0					
REPAIR, REVISION OR RECONSTRUCTION									
28200	Repair or suture of tendon, foot, flexor, single; primary or secondary, without free graft, each tendon	6.0	90	3.0					
28202	secondary with free graft, each tendon (includes obtaining graft)	8.0	90	3.0					
28208	Repair or suture of tendon, foot, extensor, single; primary or secondary, each tendon	2.8	90	3.0					
28210	secondary with free graft, each tendon (includes obtaining graft)	4.4	90	3.0					
28220	Tenolysis, flexor, single	5.0	60	3.0					
28222	multiple (through same incision)	BR	60	3.0					
28225	Tenolysis, extensor; single	2.8	60	3.0					
28226	multiple (through same incision)	BR	60	3.0					
28230	Tenotomy, open, flexor, foot, single or multiple (separate procedure)	3.0	30	3.0					
28232	toe, single (separate procedure)	1.4	30	3.0					
28234	Tenotomy, open, extensor, foot or toe	1.0	30	3.0					
28236	Transfer of tendon, anterior tibial into tarsal bone	5.0	120	3.0					
28238	Advancement of posterior tibial tendon with excision of accessory navicular bone (Kidner type procedure)	7.0	120	3.0					
	(For subcutaneous tenotomy, see 28010, 28011)								
	(For transfer or transplant of tendon with muscle redirection or rerouting, see 27690-27692)								
	(For extensor hallucis longus transfer, great toe, IP fusion, see 28760)								
28240	Tenotomy or release, abductor hallucis muscle	3.6	60	3.0					
28250	Division of plantar fascia and muscle ("Steindler stripping") (separate procedure)	6.0	60	3.0					
28260	Capsulotomy, midfoot; medial release only (separate procedure)	BR		3.0					
28261	with tendon lengthening	BR		3.0					
28262	extensive, including posterior talotibial capsulotomy and tendon(s) lengthening as for resistant clubfoot deformity	BR		3.0					
28264	Capsulotomy, midtarsal (Heyman type procedure)	12.0	90	3.0					
28270	Capsulotomy for contracture, metatarsophalangeal joint, with or without tenorrhaphy, single, each joint (separate procedure)	3.0	60	3.0					
28272	interphalangeal joint, single, each joint (separate procedure)	1.4	60	3.0					
28280	Webbing operation (create syndactylism of toes) for soft corn								
	(Kelikian type procedure)				3.6		46		3.0
28285	Hammer toe operation, one toe (e.g., interphalangeal fusion, filleting, phalangectomy) (separate procedure)				4.8		90		3.0
28286	for cock-up fifth toe with plastic skin closure, (Ruiz-Mora type procedure)				3.6		120		3.0
28288	Osteotomy, partial, exostectomy or condylectomy, single, metatarsal head, second through fifth, each metatarsal head, (separate procedure)				7.0		120		3.0
28290	Hallux valgus (bunion) correction, with or without sesamoidectomy; simple exostectomy (Silver type procedure)				4.8		60		3.0
28292	Keller, McBride or Mayo type procedure				7.0		90		3.0
28293	resection of joint with implant				8.0		120		3.0
28294	with tendon transplants (Joplin type procedure)				9.5		90		3.0
28296	with metatarsal osteotomy (Mitchell Chevron or concentric type procedure)				9.5		120		3.0
28297	Lapidus type procedure				9.5		120		3.0
28298	by phalanx osteotomy				7.0		120		3.0
28299	by other methods (e.g., double osteotomy)	BR							3.0
28300	Osteotomy; calcaneus (Dwyer or Chambers type procedure) with or without internal fixation				9.5		90		3.0
28302	talus				9.0		90		3.0
28304	Osteotomy, midtarsal bones, other than calcaneus or talus;				8.0		90		3.0
28305	with autogenous graft (includes obtaining graft) (Fowler type)				9.0		120		3.0
28306	Osteotomy, metatarsal, base or shaft, single, for shortening or angular correction; first metatarsal				7.0		90		3.0
28308	other than first metatarsal				5.6		90		3.0
28309	Osteotomy, metatarsals, multiple, for cavus foot (Swanson type procedure)	BR					120		3.0
28310	Osteotomy for shortening, angular or rotational correction; proximal phalanx, first toe (separate procedure)				2.8		90		3.0
28312	other phalanges, any toe				2.0		90		3.0
28315	Sesamoidectomy, first toe (separate procedure)	BR							3.0
28320	Repair of nonunion or malunion; tarsal bones (calcaneus, talus, etc.)	BR							3.0
28322	metatarsal, with or without bone graft (includes obtaining graft)	4.8					120		3.0
FRACTURE AND/OR DISLOCATION									
28400	Treatment of closed calcaneal fracture; without manipulation	Sv.&							
28405	with manipulation including Cotton or Bohler type reductions	BR							3.0
28406	with manipulation and skeletal fixation	BR					120		3.0
28410	Treatment of open calcaneal fracture, with uncomplicated soft tissue closure				4.0		90		3.0
28415	Open treatment of closed or open calcaneal fracture, with or without								

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
internal or external skeletal fixation	10.0	90	3.0	*28540	3.0	45	3.0
28420 with primary iliac or other autogenous bone graft (includes obtaining graft)	14.5	90	3.0	28545	*0.72	0	
28430 Treatment of closed talus fracture; without manipulation	Sv.&			28546	2.0	45	3.0
28435 with manipulation	3.0	90	3.0	28550	2.8		
28436 with manipulation and percutaneous pinning	BR		3.0	28555	2.8	45	3.0
28440 Treatment of open talus fracture, with uncomplicated soft tissue closure	4.0	90	3.0	28570	6.0	90	3.0
28445 Open treatment of closed or open talus fracture, with or without internal or skeletal fixation	10.0	90	3.0	28575	*1.0	0	
28450 Treatment of closed tarsal bone fracture (except talus and calcaneus); without manipulation, each	Sv.&			28580	2.4	45	3.0
28455 with manipulation, each	2.0	90	3.0	28585	3.2	45	3.0
28456 with manipulation reduction and percutaneous pinning, each	BR		3.0	*28600	10.0	90	3.0
28460 Treatment of open tarsal bone fracture (except talus and calcaneus), with uncomplicated soft tissue closure, each	3.0	90	3.0	28605	*0.72	0	
28465 Open treatment of closed or open tarsal bone fracture (except talus and calcaneus), with or without internal or external skeletal fixation, each	6.0	90	3.0	28606	2.0	45	3.0
28470 Treatment of closed metatarsal fracture; without manipulation, each	Sv.&			28610	3.0		3.0
28475 with manipulation, each	2.2	90	3.0	28615	2.8	45	3.0
28476 with manipulation and percutaneous pinning, each	BR		3.0	*28630	6.0	90	3.0
28480 Treatment of open metatarsal fracture, with uncomplicated soft tissue closure, each	3.0	90	3.0	28635	*0.72	0	
28485 Open treatment of closed or open metatarsal fracture, with or without internal or external skeletal fixation, each	6.0	90	3.0	28640	1.4	45	3.0
28490 Treatment of closed fracture great toe, phalanx or phalanges; without manipulation	Sv.&			28645	2.0	45	3.0
28495 with manipulation	1.2	30	3.0	*28660	4.0	90	3.0
28496 with manipulation and percutaneous pinning, each	BR			28665	*0.72	0	
28500 Treatment of open fracture great toe, phalanx or phalanges, with uncomplicated soft tissue closure	1.8	30	3.0	28670	1.2	45	3.0
28505 Open treatment of closed or open fracture great toe, phalanx or phalanges, with or without internal or external skeletal fixation	3.6	45	3.0	28675	1.6	45	3.0
28510 Treatment of closed fracture, phalanx or phalanges, other than great toe; without manipulation, each	Sv.&				2.4	60	3.0
28515 with manipulation, each	1.0	30	3.0	ARTHRODESIS			
28520 Treatment of open fracture, phalanx or phalanges, other than great toe, with uncomplicated soft tissue closure, each	1.6	30	3.0	28705	19.0	120	3.0
28525 Open treatment of closed or open fracture, phalanx or phalanges; other than great toe, with or without internal or external skeletal				28715	15.0	120	3.0
				28725	BR	120	3.0
				28730			
				28735	11.0	120	3.0
					14.0	120	3.0

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	Unit Value	Follow-up Days=	Basic Anes@
28737 Arthrodesis, midtarsal navicular-cuneiform, with tendon lengthening and advancement (Miller type procedure)	7.0	120	3.0
28740 Arthrodesis, midtarsal or tarsometatarsal, single joint	9.0	120	3.0
28750 Arthrodesis, great toe; metatarsophalangeal joint	7.0	120	3.0
28755 interphalangeal joint	4.0	120	3.0
28760 Arthrodesis, great toe, interphalangeal joint, with extensor hallucis longus transfer to first metatarsal neck (Jones type procedure)	6.0	120	3.0

(For hammertoe operation or interphalangeal fusion, see 28285)

AMPUTATION

28800 Amputation, foot; midtarsal (Chopart type procedure)	10.0	90	3.0
28805 transmetatarsal	10.0	90	3.0
28810 Amputation, metatarsal, with toe, single	6.0	90	3.0
28820 Amputation, toe; metatarsophalangeal joint	3.0	45	3.0
28825 interphalangeal joint	2.0	45	3.0

MISCELLANEOUS

28899 Unlisted procedure, foot or toes . .	BR		3.0
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(For skin grafts and flaps, see 15050-15770)

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-091, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-091, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-091, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-091, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-091, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-091, filed 1/30/74.]

WAC 296-22-097 Arthroscopy.

Surgical arthroscopy always includes a diagnostic arthroscopy. When arthroscopy is performed in conjunction with arthrotomy, add modifier -51.

	Unit Value	Follow-up Days=	Basic Anes@
29815 Arthroscopy, shoulder, diagnostic, with or without synovial biopsy (separate procedure)	7.0	60	3.0
29819 Arthroscopy, shoulder, surgical; with removal of loose body or foreign body	7.5	60	3.0
29820 synovectomy, partial	8.0	60	3.0
29821 synovectomy, complete	9.9	60	3.0
29822 debridement, limited	7.5	60	3.0
29823 debridement, extensive	9.9	60	3.0
29825 with lysis and resection of adhesions with or without manipulation	9.9	60	3.0
29830 Arthroscopy, elbow, diagnostic, with or without synovial biopsy (separate procedure)	4.7	60	3.0
29834 Arthroscopy, elbow, surgical; with removal of loose body or foreign body	5.0	60	3.0
29835 synovectomy, partial	7.1	60	3.0
29836 synovectomy, complete	8.2	60	3.0

29837 debridement, limited	7.2	60	3.0
29838 debridement, extensive	8.0	60	3.0
29870 Arthroscopy, knee, diagnostic, with or without synovial biopsy (separate procedure)	6.1	30	3.0
29871 Arthroscopy, knee, surgical; for infection, lavage and drainage	7.4	90	3.0
29872 for infection, lavage and drainage with suction irrigation	7.6	90	3.0
29874 for removal of loose body or foreign body (e.g., osteochondritis dissecans fragmentation, chondral fragmentation)	13.0	90	3.0
29875 synovectomy, limited (e.g., plica or shelf resection)	16.2	90	3.0
29876 synovectomy, major, two or more compartments (e.g., medial or lateral)	16.6	90	3.0
29877 debridement/shaving of articular cartilage (chondroplasty)	16.4	90	3.0
29879 abrasion arthroplasty (includes chondroplasty where necessary) or multiple drilling	16.8	90	3.0
29881 with meniscectomy (medical or lateral including any meniscal shaving)	16.6	90	3.0
29882 with meniscus repair (medial or lateral)	16.8	90	3.0
29884 with lysis of adhesions with or without manipulation (separate procedure)	15.2	90	3.0
29886 drilling for intact osteochondritis dissecans lesion	16.4	90	3.0
29887 drilling for intact osteochondritis dissecans lesion with internal fixation	16.8	90	3.0
29890 Arthroscopy, ankle, diagnostic, with or without synovial biopsy (separate procedure)	6.0	90	3.0
29894 Arthroscopy, ankle, surgical; with removal of loose body or foreign body	9.0	90	3.0
29895 synovectomy, partial	9.4	90	3.0
29896 synovectomy, complete	9.9	90	3.0
29897 debridement, limited	9.4	90	3.0
29898 debridement, extensive	9.9	90	3.0
29909 Unlisted procedure, arthroscopy . .	BR		3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-097, filed 7/23/87.]

RESPIRATORY SYSTEM

WAC 296-22-100 Nose respiratory system.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
(For simple furuncle, see 10020)			
*30000 Drainage abscess or hematoma, nasal, internal approach	*1.2	0	3.0
(For external approach, see 10020, 10060, 10140)			
*30020 Drainage of abscess or hematoma, nasal septum	*1.4	0	3.0

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
(For lateral rhinotomy, see specific application, e.g., 30118, 30320)				30400			
EXCISION				Rhinoplasty, primary, lateral and alar cartilages and/or elevation of nasal tip	12.0	180	3.0
(For excision of nasopharyngeal fibroma, see 42880)				(For columellar reconstruction, see 13150 et seq.)			
(For biopsy of nasopharynx, see 42804)				30410 complete, external parts including bony pyramid, lateral and alar cartilages; and/or elevation of nasal tip	18.0	180	3.0
30100 Biopsy, intranasal	0.6	7	3.0	30420 including major septal repair	20.0	180	3.0
(For biopsy skin of nose, see 11100, 11101)				30430 Rhinoplasty, secondary; minor revision (small amount of nasal tip work)	3.0	45	3.0
30110 Excision of nasal polyp(s) simple; unilateral	1.4	15	3.0	30435 intermediate revision (bony work with osteotomies)	BR	45	3.0
30111 bilateral	BR		3.0	30450 major revision (nasal tip work and osteotomies)	BR		4.0
(30110, 30111 would normally be completed in an office setting)				(30500 has been deleted, use 30520)			
30115 Excision, nasal polyp(s), extensive; unilateral	4.0	30	3.0	(For submucous resection of turbinates, see 30140)			
30116 bilateral	BR		3.0	30520 Septoplasty or submucous resection with or without cartilage scoring, contouring or replacement with graft	10.0	90	5.0
(30115, 30116 would normally require the facilities available in a hospital setting)				30540 Repair choanal atresia; intranasal	11.0	60	5.0
30117 Excision, intranasal lesion; internal approach	BR			30545 transpalatine	20.0	365	5.0
30118 external approach (lateral rhinotomy)	BR			*30560 Lysis intranasal synechia	*0.4	0	3.0
30120 Excision or surgical planing of skin of nose for rhinophyma	10.0	60	3.0	30580 Repair fistula; oromaxillary (combine with 31030 if antrotomy is included)	10.0	90	3.0
30124 Excision dermoid cyst, nose; simple, skin, subcutaneous	2.5	0	4.0	30600 oronasal	BR+		3.0
30125 complex, under bone or cartilage	BR	30	4.0	30620 Reconstruction, functional, internal nose (septal or other septal dermatoplasty) (does not include obtaining graft)	10.0	90	3.0
30130 Excision turbinate, partial or complete	2.0	30	3.0	30630 Repair nasal septal perforations	BR		3.0
30140 Submucous resection turbinate, partial or complete	6.0	90	3.0	DESTRUCTION			
(For submucous resection of nasal septum, see 30500)				*30800 Cauterization turbinates, unilateral or bilateral (separate procedure); superficial	*0.4	0	3.0
30150 Rhinectomy; partial	BR		3.0	30805 intramural	1.4	7	3.0
30160 total	BR		3.0	30820 Cryosurgery of turbinates, unilateral or bilateral	BR		3.0
(For closure and/or reconstruction, primary or delayed, see integumentary System, 13150-13152, 14060-14300, 15120-15730, 15760, 20900-20910)				OTHER PROCEDURES			
INTRODUCTION				(30900 Control of anterior nasal hemorrhage has been expanded into 30901-30904)			
*30200 Injection into turbinate(s), therapeutic	*0.48	0		*30901 Control nasal hemorrhage, anterior, simple (cauterization); unilateral	*0.6	0	
30210* Displacement therapy (Proetz type)	0.2	0	4.0	*30902 bilateral	*0.8		0
30220 Insertion, nasal septal prosthesis (button)	BR		4.0	*30903 Control nasal hemorrhage, anterior, complex (cauterization); unilateral	BR		
REMOVAL FOREIGN BODY				*30904 bilateral	BR		
*30300 Removal foreign body; internasal; office type procedure	*0.4	0	3.0	*30905 Control nasal hemorrhage, posterior, with posterior nasal packs; initial	*2.4	0	3.0
30310 requiring general anesthesia	2.0	7	3.0	*30906 subsequent	*1.6	0	3.0
30320 by lateral rhinotomy	BR		3.0	30915 Ligation, arteries, ethmoidal	10.0	30	3.0
REPAIR				30920 internal maxillary artery, transantral	BR		3.0
(For obtaining tissues for graft, see 20900-20926, 21210)				(For ligation external carotid artery, see 37600)			
(See also repair-complex, 13000-15760 and 21210-21235)							

Surgical Fees

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	Unit Value	Follow-up Days=	Basic Anes@
30930 Fracture nasal turbinate(s) therapeutic	BR		3.0
30999 Unlisted procedure, nose	BR		3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-100, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-100, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-100, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-100, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-100, filed 1/30/74; Order 68-7, § 296-22-100, filed 11/27/68, effective 1/1/69.]

WAC 296-22-115 Trachea and bronchi.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
31600 Tracheostomy, planned (separate procedure);	5.4	15	6.0
31601 under two years	6.0	15	6.0
31603 Tracheostomy, emergency procedure, transtracheal	BR	90	6.0
31605 Cricothyroid membrane	BR		4.0
31610 Tracheostomy, fenestration procedure with skin flaps	7.0	15	6.0
(For endotracheal intubation, see 31500)			
(For tracheal aspiration under direct vision, see 31515)			
31612 Tracheal puncture, percutaneous for aspiration of mucus (transtracheal aspiration)	BR		4.0
31613 Tracheostoma revision; simple, without flap rotation	BR	30	5.0
31614 complex, with flap rotation	BR	30	5.0
ENDOSCOPY			
31615 Tracheobronchoscopy through established tracheostomy incision ..			4.0
(31620-31621 have been deleted, use 31622)			
31622 Bronchoscopy; diagnostic, (flexible or rigid), with or without cell washing or brushing	3.6		5.0
31625 with biopsy, rigid bronchoscope	5.0	30	4.0
(31626 has been deleted, use 31625)			
(31627 has been deleted, use 31622)			
31628 with transbronchial lung biopsy, with or without fluoroscopic guidance	BR		5.0
31629 with transbronchial needle aspiration biopsy	BR		5.0
31630 with tracheal or broncheal dilation or closed reduction of fracture	6.0	30	6.0
31631 with tracheal dilation and placement of tracheal stent ..	BR		4.0
31635 with removal of foreign body ..	5.6	30	4.0
31640 with excision of tumor	5.0	30	4.0
31641 with destruction of tumor or relief of stenosis by any method other than excision (e.g., laser)	BR	30	4.0

	Unit Value	Follow-up Days=	Basic Anes@
31645 with therapeutic aspiration of tracheobronchial tree, initial (e.g., drainage of lung abscess) ..	4.0	30	4.0
31646 with therapeutic aspiration of tracheobronchial tree, subsequent	2.6	30	4.0
(For catheter aspiration of tracheobronchial tree at bedside, see 31725)			
(31650-31651 have been deleted, see 31645-31646)			
31656 with injection of contrast material for segmental bronchography (fiberscope only)	4.0	30	4.0
(For radiological procedure, see 71040, 71060)			
31659 with other bronchoscopic procedures	BR		4.0

INTRODUCTION

(For endotracheal intubation, see 31500)			
(For tracheal aspiration under direct vision, see 31515)			
31700 Catheterization transglottic (separate procedure)	3.6	0	
31708 Instillation of contrast material for laryngography or bronchography, without catheterization ..	0.9	0	
31710 Catheterization for bronchography, with or without instillation of contrast material	0.8	0	
(For bronchoscopic catheterization for bronchography, fiberscope only, see 31656)			
31715 Transtracheal injection for bronchography	0.8	0	
(For detention time, see 99150, 99151)			
31717 Catheterization with bronchial brush biopsy	BR		
31719 Transtracheal (percutaneous) introduction of indwelling tube for therapy (tickle tube)	BR		
31720 Catheter aspiration (separate procedure); nasotracheobronchial ...	0.8	0	
31725 tracheobronchial with fiberscope, bedside	1.0	0	

REPAIR

31750 Tracheoplasty; cervical	BR		6.0
31755 tracheopharyngeal fistulization (Asai technique), each stage	BR		6.0
31760 intrathoracic	BR		12.0
31770 Bronchoplasty; graft repair	BR		11.0
31775 excision stenosis and anastomosis	BR		11.0
(For lobectomy and bronchoplasty, see 32485)			
31780 Excision tracheal stenosis and anastomosis; cervical	BR		11.0
31781 cervicothoracic	BR		11.0
31785 Excision of tracheal tumor or carcinoma; cervical	BR		11.0

	Unit Value	Follow-up Days=	Basic Anes@
31786 thoracic	BR		11.0
SUTURE			
31800 Suture of external tracheal wound or injury; cervical	BR		6.0
31805 intrathoracic	BR		12.0
31820 Surgical closure tracheostomy or fistula; without plastic repair	4.0	30	4.0
31825 with plastic repair	6.0	30	4.0
(For repair of tracheoesophageal fistula, see 43305-43312)			
31830 Revision of tracheostomy scar ...	5.60	30	4.0
31899 Unlisted procedure, trachea, bronchi	BR		4.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-115, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-115, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-115, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-115, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-115, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-115, filed 1/30/74; Order 68-7, § 296-22-115, filed 11/27/68, effective 1/1/69.]

WAC 296-22-116 Lungs and pleura.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
*32000 Thoracentesis, puncture of pleural cavity for aspiration, initial or subsequent	*0.72	0	
32005 Chemical pleurodesis (e.g., for recurrent or persistent pneumothorax)	BR		
*32020 Tube thoracostomy with water seal(e.g., pneumothorax, hemothorax, empyema) (separate procedure)	*1.2	0	
32035 Thoracostomy; with rib resection for empyema	6.0	60	3.0
32036 with open flap drainage for empyema	8.0	90	3.0
32095 Thoracotomy limited, for biopsy of lung or pleura	BR		3.0
32100 Thoracotomy, major; with exploration and biopsy	12.0	90	11.0
32110 with control of traumatic hemorrhage and/or repair of lung tear	16.0	90	11.0
32120 for postoperative complications	16.0	90	11.0
32124 with open intrapleural pneumonolysis	16.0	90	11.0
32140 with cyst(s) removal with or without a pleural procedure ..	16.0	90	11.0
32141 with excision-plication of bullae, with or without any pleural procedure	20.0	90	11.0
32150 with removal of intrapleural foreign body or fibrin deposit .	14.0	90	11.0
32151 with removal of intrapulmonary foreign body	16.0	90	11.0
32160 with cardiac massage	BR		12.0

(For segmental or other resections of lung, see 32480-32525)

	Unit Value	Follow-up Days=	Basic Anes@
32200 Pneumonostomy, with open drainage of abscess or cyst	14.0	120	11.0
32215 Pleural scarification for repeat pneumothorax	16.0	90	11.0
32220 Decortication, pulmonary, (separate procedure); total	20.0	90	11.0
32225 partial	14.0	90	11.0

EXCISION

32310 Pleurectomy; parietal (separate procedure)	20.0	90	11.0
32315 partial	15.0	90	11.0
32320 Decortication and parietal pleurectomy	28.0	90	11.0
32400 Biopsy, pleura; percutaneous needle	1.2	7	

(For CT guidance, see 76360, 76361; for ultrasonic guidance, see 76942, 76943)

32402 open	6.0	15	3.0
32405 Biopsy, lung, percutaneous needle	3.0	7	3.0

(For fine needle aspiration, preparation, and interpretation of smears, see 88170-88173)

*32420 Pneumonocentesis, puncture of lung for aspiration	*1.2	0	
32440 Pneumonectomy, total	30.0	90	11.0
32445 Pneumonectomy, extrapleural; without empyemectomy	20.0	90	11.0
32450 with empyemectomy	25.0	90	11.0
32480 Lobectomy, total or segmental; .	26.0	90	11.0
32485 with bronchoplasty	30.0	90	11.0
32490 with concomitant decortication	30.0	90	11.0
32500 Wedge resection, of lung; single or multiple	22.0	90	11.0
32520 Resection of lung; with resection of chest wall	30.0	90	11.0
32522 with reconstruction of chest wall, without prosthesis	32.0	90	11.0
32525 with major reconstruction of chest wall, with prosthesis ...	35.0	90	11.0
32540 Extrapleural enucleation of empyema (empyemectomy);	20.0	90	11.0
32545 with lobectomy	30.0	90	11.0

ENDOSCOPY

32700 Thoracoscopy, exploratory (separate procedure);	4.0	30	4.0
32705 with biopsy	4.0	30	4.0

REPAIR

32800 Repair lung hernia through chest wall	BR		11.0
32810 Closure of chest wall following open flap drainage for empyema (Clagett type procedure)	BR		11.0
32815 Open closure of major bronchial fistula	BR		11.0
32820 Major reconstruction, chest wall (post-traumatic)	BR		11.0

SURGICAL COLLAPSE THERAPY; THORACOPLASTY

(See also 32520)

32900 Resection of ribs, extrapleural, all stages	14.0	90	10.0
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	Unit Value	Follow-up Days=	Basic Anes@
32905 Thoracoplasty, Schede type or extrapleural (all stages);	14.0	90	9.0
32906 with closure of bronchopleural fistula	16.0	90	9.0
(For open closure of major bronchial fistula, see 32815)			
(For resection of first rib for thoracic outlet compression, see 21615, 21616)			
32940 Pneumonolysis, extraperiosteal, including filling or packing procedures	14.0	90	9.0
*32960 Pneumothorax; therapeutic, intrapleural injection of air	*1.0	0	
32999 Unlisted procedure, lungs and pleura	BR		9.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-116, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-116, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-116, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-116, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-116, filed 1/30/74; Order 68-7, § 296-22-116, filed 11/27/68, effective 1/1/69.]

CARDIOVASCULAR SYSTEM

The listed values are for the principal surgeon only. For concurrent services of other physicians (e.g., team surgery, co-surgeon), see WAC 296-22-010, item 5 and appropriate unit value modifiers.

(For monitoring, operation of pump and other non-surgical services, see 99150-99192)

WAC 296-22-120 Heart and pericardium.

(For other medical or laboratory related services, see appropriate section)

	Unit Value	Follow-up Days=	Basic Anes@
33010* Pericardiocentesis; initial	1.2	0	
33011* subsequent	1.0	0	
33015 Tube pericardiostomy	BR		
33020 Pericardiostomy for removal of clot or foreign body (primary procedure)	20.0	90	13.0
33025 Creation of pericardial window or partial resection for drainage	20.0	15	15.0
33030 Partial resection for chronic constrictive pericarditis, without bypass	30.0	90	15.0
33035 Complete ventricular decortication, with cardiopulmonary bypass	40.0	90	15.0
33050 Excision of pericardial cyst or tumor	20.0	90	13.0
33100 Pericardiectomy (separate procedure)	34.0	90	15.0

CARDIAC TUMOR

33120 Excision of intracardiac tumor, resection with cardiopulmonary bypass	50.0	90	15.0
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33130 Resection of external cardiac tumor	25.0	90	12.0
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PACEMAKER

(For electronic analysis of internal pacemaker system, see 93795, 93796)

(Procedures include repositioning or replacement in first fourteen days)

(For fluoroscopy and radiography procedure with insertion of pacemaker, see 71090)

33200 Insertion of permanent pacemaker with epicardial electrode; by thoracotomy	24.0	90	15.0
33201 by xiphoid approach	24.0	90	15.0

(33205 has been deleted. To report use 33206-33208)

33206 Insertion of permanent pacemaker with transvenous electrode(s); atrial	BR		3.0
33207 ventricular	BR		3.0
33208 AV sequential	BR		3.0
33210 Insertion of temporary transvenous cardiac electrode, or pacemaker catheter (separate procedure)	7.0	15	Sv.&
33212 Insertion or replacement of pulse generator only	4.0	30	6.0
33216 Insertion, replacement, or repositioning of permanent transvenous electrodes only (15 days or more after initial insertion)	8.0	30	6.0
33218 Repair of pacemaker; electrodes only	5.0	30	6.0
33219 with replacement of pulse generator	BR		6.0
33232 Removal of permanent pacemaker	BR		6.0
33245 Implantation of automatic internal defibrillator pads and epicardial sensing electrodes by medianter-notomy	BR		6.0

WOUNDS OF THE HEART AND GREAT VESSELS

33300 Repair of cardiac wound; without bypass	24.0	90	15.0
33305 with cardiopulmonary bypass	30.0	90	15.0
33310 Cardiotomy, exploratory (includes removal of foreign body); without bypass	22.0	90	15.0
33315 with cardiopulmonary bypass	34.0	90	15.0
33320 Suture repair of aorta or great vessels; without bypass	20.0	90	15.0
33322 with cardiopulmonary bypass	30.0	90	15.0
33330 Insertion of graft; without bypass	30.0	90	15.0
33335 with cardiopulmonary bypass	40.0	90	15.0
33350 Great vessel repair with other major procedure	BR		15.0

CARDIAC VALVES AORTIC VALVE

33400 Valvuloplasty, aortic valve, open, with cardiopulmonary bypass	50.0	90	15.0
33404 Construction of apical-aortic conduit	BR	90	15.0
33405 Replacement, aortic valve with cardiopulmonary bypass	52.0	90	15.0

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
33407				33492			
Valvotomy, aortic valve (commisurotomy); with cardiopulmonary bypass	BR		15.0	Triple valve replacement	85.0	90	15.0
33408				CORONARY ARTERY PROCEDURES			
with inflow occlusion	BR		15.0	33502			
(For multiple valve replacement, see 33480-33492)				Anomalous coronary artery; ligation	20.0	90	15.0
33411				33503			
Replacement aortic valve; with aortic annulus enlargement, noncoronary	BR	90	15.0	graft, without cardiopulmonary bypass	25.0	90	15.0
33412				33504			
with transventricular aortic annulus enlargement (Konno procedure)	BR	90	15.0	graft, with cardiopulmonary bypass	35.0	90	15.0
33415				33510			
Resection of aortic valve for subvalvular stenosis	40.0	90	15.0	Coronary artery bypass, autogenous graft, (e.g., saphenous vein or internal mammary artery); single graft	35.0	90	15.0
33417				33511			
Aortoplasty (gusset) for supra-valvular stenosis	40.0	90	15.0	two coronary grafts	56.0	90	15.0
MITRAL VALVE				33512			
33420				three coronary grafts	67.0	90	15.0
Valvotomy, mitral valve (commisurotomy); closed	32.0	90	15.0	33513			
33422				four coronary grafts	67.0	90	15.0
open, with cardiopulmonary bypass	50.0	90	15.0	33514			
33425				five coronary grafts	67.0	90	15.0
Valvuloplasty, mitral valve, with cardiopulmonary bypass	52.0	90	15.0	33516			
33430				six or more coronary grafts	67.0	90	15.0
Replacement, mitral valve, with cardiopulmonary bypass	52.0	90	15.0	(For separate procurement of autogenous graft, see modifier -75, services rendered by more than one physician)			
TRICUSPID VALVE				33520			
33450				Coronary artery bypass, nonautogenous graft (e.g., synthetic or cadaver); single graft	30.0	90	15.0
Valvotomy, tricuspid valve (commisurotomy); closed	32.0	90	15.0	33525			
33452				two coronary grafts	35.0	90	15.0
open, with cardiopulmonary bypass	50.0	90	15.0	33528			
33460				three or more coronary grafts	50.0	90	15.0
Valvuloplasty or valvectomy, tricuspid valve, with cardiopulmonary bypass;	50.0	90	15.0	(33532 Myocardial implantation has been deleted. To report, use 33999)			
33465				POSTINFARCTION MYOCARDIAL PROCEDURES			
replacement	52.0	90	15.0	33542			
(For multiple valve replacement, see 33480-33492)				Myocardial resection (e.g., ventricular aneurysmectomy)	35.0	90	15.0
33468				33545			
Tricuspid valve repositioning and plication for Ebstein anomaly	50.0	90	15.0	Repair of postinfarction ventricular septal defect, with or without myocardial resection	50.0	90	15.0
PULMONARY VALVE				33560			
33470				Myocardial operation combined with coronary bypass procedure	BR		
Valvotomy, pulmonary valve (commisurotomy); closed (transventricular)	32.0	90	15.0	33570			
33471				Coronary angioplasty (end arterectomy, with or without gas, arterial implantation or anastomosis), with bypass;	60.0	90	15.0
transvenous balloon method	BR	90	15.0	33575			
33472				combined with vascularization	68.0	90	15.0
open, with inflow occlusion	32.0	90	15.0	SEPTAL DEFECT			
33474				33640			
open, with cardiopulmonary bypass	50.0	90	15.0	Repair atrial septal defect, secundum; direct closure without cardiopulmonary without bypass	32.0	90	15.0
33476				33641			
Right ventricular resection for infundibular stenosis, with or without commissurotomy	50.0	90	15.0	direct closure with cardiopulmonary bypass	46.0	90	15.0
33478				33643			
Outflow tract augmentation (gusset), with or without commissurotomy or infundibular resection	52.0	90	15.0	patch closure, with or without anomalous pulmonary venous drainage	30.0	90	15.0
MULTIPLE VALVE PROCEDURES				33645			
33480				Direct or patch closure, sinus venosus, with or without anomalous pulmonary venous drainage	30.0	90	15.0
Replacement and/or repair, double valve procedure, by methods 33400-33465	70.0	90	15.0	33647			
33481				Repair of atrial septal defect and ventricular septal defect, with direct or patch closure	BR	90	15.0
Single valve replacement; with commissurotomy or valvuloplasty of another valve	56.0	90	15.0	33649			
33482				Repair of tricuspid atresia (e.g., Fontan, Gago procedures)	BR		15.0
with commissurotomy or valvuloplasty of two valves	60.0	90	15.0	33660			
33483				Patch closure, endocardial cushion defect, with or without repair of mitral and/or tricuspid cleft;	50.0	90	15.0
Double valve replacement;	65.0	90	15.0	33665			
33485				with repair of separate ventricular septal defect	35.0	90	15.0
with commissurotomy or valvuloplasty of one valve	67.0	90	15.0	33670			
33490				Repair of complete atrioventricular canal, with or without prosthetic valve	50.0	90	15.0
Replacement and/or repair, triple valve procedure, by methods 33400 to 33465	80.0	90	15.0				

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	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
33681 Closure ventricular septal defect; direct	35.0	90	15.0	TRUNCUS ARTERIOSUS			
33682 patch	50.0	90	15.0	33786 Total repair, truncus arteriosus (Rastelli type operation)	50.0	90	15.0
33684 with pulmonary valvotomy or infundibular resection (acyanotic)	50.0	90	15.0	33788 Replant pulmonary artery for hemitruncus	30.0	90	15.0
33688 with removal of pulmonary artery band, with or without gusset	5.0			(For pulmonary artery band, see 33690)			
33690 Banding of pulmonary artery ...	15.0	90	15.0	AORTIC ANOMALIES			
33692 Total repair tetralogy of Fallot; intact outflow tract	50.0	90	15.0	33802 Division of aberrant vessel (vascular ring);	18.0	90	15.0
33694 with outflow tract gusset	50.0	90	15.0	33803 with reanastomosis	20.0	90	15.0
33696 with closure of previous shunt ..	8.0			33810 Creation of aortopulmonary window; without bypass	20.0	90	15.0
SINUS OF VALSALVA				33812 with cardiopulmonary bypass ..	30.0	90	15.0
33702 Repair sinus of Valsalva fistula, with cardiopulmonary bypass; ...	50.0	90	15.0	33820 Patent ductus arteriosus; ligation (primary procedure)	15.0	90	15.0
33710 with repair of ventricular septal defect	35.0	90	15.0	33822 division, under 18 years	18.0	90	15.0
33720 Repair sinus of Valsalva aneurysm, with cardiopulmonary bypass	50.0	90	15.0	33824 division, 18 years and older ...	20.0	90	15.0
TOTAL ANOMALOUS PULMONARY VENOUS DRAINAGE				33830 ligation or division when performed with another procedure ..	5.0		15.0
33730 Complete repair of anomalous venous return (supracardiac, intracardiac, or infracardiac types) ...	50.0	90	15.0	33840 Excision of coarctation of aorta, with or without associated patent ductus arteriosus; with direct anastomosis	20.0	90	15.0
(For partial anomalous return, see atrial septal defect)				33845 with graft	30.0	90	15.0
SHUNTING PROCEDURES				(33850 has been deleted, use 33999)			
33735 Atrial septectomy or septostomy; closed (Blalock-Hanlon type operation)	32.0	90	15.0	33851 repair using left subclavian artery as gusset for enlargement of segment (Waldhusen procedure)	BR	90	15.0
33737 open, with inflow occlusion ...	40.0	90	15.0	THORACIC AORTIC ANEURYSM			
33738 transvenous method, balloon, Rashkind type (includes cardiac catheterization)	50.0	90	15.0	33860 Ascending aorta graft, with cardiopulmonary bypass; with or without coronary implant, with or without valve suspension; without valve replacement	40.0	90	15.0
33739 blade method (Sang-Park septostomy) (includes cardiac catheterization)	BR		15.0	33865 with valve replacement	50.0	90	15.0
33750 Shunt; subclavian to pulmonary artery (Blalock-Taussig type operation)	30.0	90	15.0	33870 Transverse arch graft, with cardiopulmonary bypass	60.0	90	15.0
33755 ascending aorta to pulmonary artery (Waterston type operation)	30.0	90	15.0	33875 Descending thoracic aorta graft, with or without bypass	20.0	90	15.0
33762 descending aorta to pulmonary artery (Potts-Smith type operation)	30.0	90	15.0	PULMONARY ARTERY			
33764 central, with prosthetic graft ..	BR	90	15.0	33910 Pulmonary artery embolectomy; with cardiopulmonary bypass	30.0	90	15.0
33766 vena cava to pulmonary artery (Glenn type operation)	30.0	90	15.0	33915 without bypass	20.0	90	15.0
TRANSPOSITION OF THE GREAT VESSELS				MISCELLANEOUS			
33782 Repair transposition of great vessels, atrial baffle procedure (Mustard or Senning type); with cardiopulmonary bypass	50.0	90	15.0	33930 Donor cardiectomy-pneumonec-tomy, with preparation and main-tenance of homograft	BR		15.0
33783 with removal of pulmonary artery band, with or without gusset	50.0	90	15.0	33935 Heart-lung transplant with recipi-ent cardiectomy-pneumonec-tomy ..	BR		
33784 with closure of ventricular septal defect	50.0	90	15.0	33940 Donor cardiectomy, with prepara-tion and maintenance of homo-graft	BR		
33785 Repair transposition of great vessels; aortic pulmonary artery reconstruction (Jatene type) ...	BR	90	15.0	33945 Heart transplant, with or without recipient cardiectomy	BR		
				(33950 has been deleted, use 33940, 33945)			
				33960 Prolonged extracorporeal circula-tion for cardiopulmonary insuffi-ciency	BR		15.0
				33970 Intra-aortic balloon counterpulsat-ion; insertion only	BR	10	15.0

	Unit Value	Follow-up Days=	Basic Anes@
(For percutaneous insertion use 93536)			
33971 removal of balloon including repair of artery with or without graft	BR		15.0
33972 monitoring only	BR		15.0
33999 Unlisted procedure, cardiac surgery.....	BR		15.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-120, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-120, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-120, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-120, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-120, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-120, filed 1/30/74; Order 68-7, § 296-22-120, filed 11/27/68, effective 1/1/69.]

WAC 296-22-125 Arteries and veins. Primary vascular procedure listings include establishing both inflow and outflow by whatever procedures necessary. Also included is that portion of the operative arteriogram performed by the surgeon, as indicated. Sympathectomy, when done, is included in the listed aortic procedures.

	Unit Value	Follow-up Days=	Basic Anes@
ARTERIAL EMBOLCTOMY OR THROMBECTOMY, WITH OR WITHOUT CATHETER			
34001 Embolectomy or thrombectomy, with or without catheter; carotid, subclavian, or innominate artery, by neck incision	14.0	60	6.0
34051 innominate, subclavian artery, by thoracic incision	14.0	60	11.0
34101 axillary, brachial, innominate, subclavian artery, by arm incision	14.0	60	5.0
34111 radial or ulnar	BR	60	5.0
34151 renal, celiac, mesentery, aortoiliac artery, by abdominal incision	20.0	60	6.0
34201 femoropopliteal, aortoiliac artery, by leg incision	14.0	60	5.0
34203 popliteal-tibio-peroneal, by leg incision	BR	60	5.0

	Unit Value	Follow-up Days=	Basic Anes@
VENOUS THROMBECTOMY, DIRECT OR WITH CATHETER			
34401 Thrombectomy, direct or with catheter; vena cava, iliac vein, by abdominal incision	18.0	60	5.0
34421 vena cava, iliac, femoropopliteal vein, by leg incision	12.0	60	3.0
34451 vena cava, iliac, femoropopliteal vein, by abdominal and leg incision	24.0	60	5.0
34471 subclavian vein, by neck incision	28.0	60	5.0
34490 axillary and subclavian vein, by arm incision	28.0	60	5.0

	Unit Value	Follow-up Days=	Basic Anes@
VENOUS RECONSTRUCTION			
34501 Valvuloplasty, femoral vein	BR		
34510 Venous valve transposition, any vein donor	BR		
34520 Cross-over vein graft to venous system	BR		

	Unit Value	Follow-up Days=	Basic Anes@
34530 Saphenopopliteal vein anastomosis	BR		
DIRECT REPAIR OF ANEURYSM, OR EXCISION (PARTIAL OR TOTAL) AND GRAFT INSERTION FOR ANEURYSM, FALSE ANEURYSM, RUPTURED ANEURYSM, OR OCCLUSIVE DISEASE			
(For intracranial aneurysm, see 61700 et seq.)			
(For thoracic aortic aneurysm, see 33860-33875)			
35001 Direct repair of aneurysm or excision (partial or total) and graft insertion, with or without patch graft; for aneurysm or occlusive disease, carotid, subclavian artery, by neck incision	28.0	90	6.0
35002 for ruptured aneurysm, carotid, subclavian artery by neck incision	BR		6.0
35005 for aneurysm or occlusive disease, vertebral artery	BR		
35011 for aneurysm or occlusive disease, axillary-brachial artery, by arm incision	28.0	90	5.0
35013 for ruptured aneurysm, axillary-brachial artery, by arm incision	BR		
35021 for aneurysm or occlusive disease, innominate, subclavian artery, by thoracic incision ...	32.0	90	12.0
35022 for ruptured aneurysm, innominate, subclavian artery, by thoracic incision	BR		
35045 for aneurysm or occlusive disease, radial or ulnar artery ...	BR		
35081 for aneurysm or occlusive disease, abdominal aorta	40.0	90	12.0
35082 for ruptured aneurysm, abdominal aorta	BR		12.0
35091 for aneurysm or occlusive disease, abdominal aorta involving visceral vessels (mesenteric, celiac, renal) ...	BR		12.0
35092 for ruptured aneurysm, abdominal aorta involving visceral vessels (mesenteric, celiac, renal)	BR		12.0
35102 for aneurysm or occlusive disease, abdominal aorta involving iliac vessels (common, hypogastric, external)	40.0	90	12.0
35103 for ruptured aneurysm, abdominal aorta involving iliac vessels (common, hypogastric, external)	BR		12.0
35111 for aneurysm or occlusive disease, splenic artery	24.0	90	6.0
35112 for ruptured aneurysm, splenic artery	BR		
35121 for aneurysm or occlusive disease, hepatic, celiac, renal, or mesenteric artery	40.0	90	6.0
35122 for ruptured aneurysm, hepatic, celiac, renal, or mesenteric artery	BR		6.0
35131 for aneurysm or occlusive disease, iliac artery (common, hypogastric, external)	32.0	90	6.0
35132 for ruptured aneurysm, iliac artery (common, hypogastric,			

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
35141 external)	BR		6.0	35381 femoral and/or popliteal, and/or tibioperoneal	28.0	90	5.0
35142 for aneurysm or occlusive disease, common femoral artery (profunda femoris, superficial femoral)	28.0	90	5.0	TRANSLUMINAL ANGIOPLASTY, INTRAOPERATIVE			
35151 for ruptured aneurysm, common femoral artery (profunda femoris, superficial femoral)	BR			(If done as part of another operation, use modifier -51 or -52)			
35152 for aneurysm or occlusive disease, popliteal artery	28.0	90	5.0	35450 Transluminal angioplasty, intraoperative (separate procedure); renal	BR		
35161 for ruptured aneurysm, popliteal artery	BR		5.0	35452 aortic	BR		
35162 for aneurysm or occlusive disease, other arteries	BR		5.0	35454 iliac	BR		
				35456 femoral-popliteal	BR		
				35458 subclavian-axillary	BR		
REPAIR ARTERIOVENOUS FISTULA				BYPASS GRAFT—VEIN			
35180 Repair, congenital arteriovenous fistula; head and neck	28.0	60	6.0	35501 Bypass graft, vein; carotid	30.0	90	6.0
35182 thorax and abdomen	34.0	60	6.0	35506 carotid-subclavian	30.0	90	6.0
35184 extremities	28.0	60	6.0	35507 subclavian-carotid	30.0	90	6.0
35188 Repair, acquired or traumatic arteriovenous fistula; head and neck	30.0	60	6.0	35508 carotid-vertebral	30.0	90	11.0
35189 thorax and abdomen	40.0	60	6.0	35509 carotid-carotid	30.0	90	11.0
35190 extremities	30.0	60	6.0	35511 subclavian-subclavian	30.0	90	11.0
				35515 subclavian-vertebral	30.0	90	11.0
				35516 subclavian-axillary	30.0	90	6.0
				35518 axillary-axillary	30.0	90	5.0
				35521 axillary-femoral	30.0	90	5.0
				35526 aortosubclavian or carotid	32.0	90	12.0
				35531 aortoceliac, or aortomesenteric	36.0	90	12.0
REPAIR BLOOD VESSEL OTHER THAN FOR FISTULA, WITH OR WITHOUT PATCH GRAFT				35533 axillary-femoral-femoral	BR	90	12.0
35201 Repair blood vessels, direct; neck	28.0	60	10.0	35536 splenorenal	32.0	90	10.0
35206 upper extremity	28.0	60	10.0	35541 aortoiliac	32.0	90	12.0
35207 hand and finger	BR	60	10.0	35546 aortofemoral or bifemoral	32.0	90	12.0
35211 intrathoracic, with bypass	35.0	60	10.0	35548 aortoiliofemoral, unilateral	32.0	90	12.0
35216 intrathoracic, without bypass	30.0	60	10.0	35549 aortoiliofemoral, bilateral	40.0	90	12.0
35221 intra-abdominal	34.0	90	10.0	35551 aorto-femoral-popliteal	40.0	90	12.0
35226 lower extremity	28.0	60	8.0	35556 femoral-popliteal	28.0	90	5.0
35231 Repair blood vessel with vein graft; neck	30.0	60	6.0	35558 femoral-femoral	28.0	90	5.0
35236 upper extremity	30.0	60	6.0	35560 aorto-renal	BR	90	12.0
35241 intrathoracic, with bypass	40.0	60	6.0	35563 ilioiliac	30.0	90	12.0
35246 intrathoracic, without bypass	35.0	60	6.0	35565 iliofemoral	32.0	90	12.0
35251 intra-abdominal	40.0	90	6.0	35566 femoral-anterior tibial, posterior tibial, or peroneal artery	30.0	90	12.0
35256 lower extremity	32.0	60	3.0	35571 popliteal-tibial	32.0	90	12.0
35261 Repair blood vessel with graft other than vein; neck	32.0	60	6.0	IN-SITU VEIN BYPASS			
35266 upper extremity	32.0	60	6.0	35582 In-situ vein bypass; aortofemoral-popliteal (only femoral-popliteal portion in-situ)	BR	90	12.0
35271 intrathoracic, with bypass	42.0	60	6.0	35583 femoral-popliteal	BR	90	12.0
35276 intrathoracic, without bypass	37.0	60	6.0	35585 femoral-anterior tibial, posterior tibial, or peroneal artery	BR	90	12.0
35281 intra-abdominal	42.0	90	6.0	35587 popliteal-tibial, peroneal	BR	90	12.0
35286 lower extremity	34.0	60	3.0	BYPASS GRAFT—WITH OTHER THAN VEIN			
THROMBOENDARTERECTOMY				35601 Bypass graft, with other than vein, carotid	40.0	90	12.0
(For coronary artery, see 33570, 33575)				35606 carotid-subclavian	40.0	90	12.0
35301 Thromboendarterectomy, with or without patch graft; carotid, vertebral, subclavian, by neck incision	30.0	90	6.0	35612 subclavian-subclavian	40.0	90	12.0
35311 subclavian, innominate, by thoracic incision	30.0	90	11.0	35616 subclavian-axillary	30.0	90	6.0
35321 axillary-brachial	30.0	90	5.0	35621 axillary-femoral	35.0	90	12.0
35331 abdominal aorta	40.0	90	12.0	35626 aortosubclavian or carotid	35.0	90	12.0
35341 mesenteric, celiac, or renal	40.0	90	6.0	35631 aortoceliac, aorto mesenteric, aorto renal	35.0	90	12.0
35351 iliac	32.0	90	6.0	35636 splenorenal	35.0	90	12.0
35355 iliofemoral	BR	90	6.0	35637 vertebral-carotid transposition	BR	90	12.0
35361 combined aortoiliac	40.0	90	12.0	35638 vertebral-subclavian transposition	BR	90	12.0
35363 combined aortoiliofemoral	BR	90	12.0	35641 aortoiliac	35.0	90	12.0
35371 common and/or deep (profunda) femoral	28.0	90	5.0	36642 carotid-vertebral	BR	90	12.0
				35645 subclavian-vertebral	BR	90	12.0

	Unit Value	Follow-up Days=	Basic Anes@
37700 Ligation and division of long saphenous vein at saphenofemoral junction, or distal interruptions; unilateral	4.8	30	3.0
37701 bilateral	6.0	60	3.0
37720 Ligation and division and complete stripping of long or short saphenous veins; unilateral	7.0	30	3.0
37721 bilateral	12.0	30	3.0
37730 Ligation and division and complete stripping of long and short saphenous veins; unilateral	10.0	30	3.0
37731 bilateral	14.5	30	3.0
37735 Ligation and division and complete stripping of long or short saphenous veins with radical excision of ulcer and skin graft and/or interruption of communicating veins of lower leg, with excision of deep fascia; unilateral	18.0	30	3.0
37737 bilateral	22.0	30	3.0
37760 Ligation of perforators, subfascial, radical (Linton type), with or without skin graft	10.0	60	3.0
37780 Ligation and division of short saphenous vein at saphenopopliteal junction (separate procedure); unilateral	2.0	30	3.0
37781 bilateral	4.0	30	3.0
37785 Ligation and division of minor varicose vein of leg	1.2	15	3.0
37787 Bilateral	1.8	15	3.0
37799 Unlisted procedure, vascular surgery	BR		3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-125, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-125, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-125, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-125, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-125, filed 1/30/74; Order 68-7, § 296-22-125, filed 11/27/68, effective 1/1/69.]

HEMIC AND LYMPHATIC SYSTEMS

WAC 296-22-130 Spleen.

	Unit Value	Follow-up Days=	Basic Anes@
EXCISION			
(38090 has been deleted, use 38999)			
38100 Splenectomy (separate procedure); total	14.5	45	6.0
38101 partial	14.5	45	6.0

REPAIR

38115 Repair of ruptured spleen (splenorrhaphy) with or without partial splenectomy	13.0	45	6.0
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38200 Injection procedure for splenoportography	2.0	7	3.0
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[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-130, filed 7/23/87; 83-16-066 (Order 83-23), § 296-22-130, filed 8/2/83. Statutory Authority: RCW

51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-130, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-130, filed 1/30/74; Order 68-7, § 296-22-130, filed 11/27/68, effective 1/1/69.]

WAC 296-22-135 Lymph nodes and lymphatic channels.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
*38300 Drainage of lymph node abscess or lymphadenitis, simple	*0.6	0	3.0
38305 extensive	BR		3.0
38308 Lymphangiectomy or other operations on lymphatic channels	BR		3.0
38380 Suture and/or ligation of thoracic duct; cervical approach	BR		3.0
38381 thoracic approach	BR		3.0
38382 abdominal approach	BR		3.0
EXCISION			
38500 Biopsy or excision of lymph node(s); superficial (separate procedure)	1.4	15	3.0
38505 by needle, superficial (e.g., cervical, inguinal, axillary)	BR		
(for fine needle aspiration, use 88170)			
38510 deep, cervical node(s)	3.4	30	3.0
38520 deep cervical node(s) with excision scalene fat pad	5.0	30	3.0
38525 deep axillary node(s)	BR		
38530 internal mammary node(s) (separate procedure)	7.0	60	3.0
(For percutaneous needle biopsy, retroperitoneal lymph node or mass, see 49180; for fine needle aspiration, use 88171)			
(38540 has been deleted, use 38510, 38520)			
38542 Dissection deep jugular node(s)	BR	60	3.0
(For radical cervical neck dissection, see 38720, 38721)			
38550 Excision of cystic hygroma, axillary or cervical, without deep neurovascular dissection; simple	6.0	60	3.0
38555 complex	BR		3.0
38562 Limited lymphadenectomy for staging (separate procedure); pelvic	BR		
38564 retroperitoneal (aortic and/or splenic)	BR		
(When combined with prostatectomy, use 55812 or 55842)			
(When combined with insertion of radioactive substance into prostate, use 55862)			
RADICAL LYMPHADENECTOMY (RADICAL RESECTION OF LYMPH NODES)			
38700 Suprahyoid lymphadenectomy; unilateral	12.0	60	4.0
38701 bilateral	15.0	60	4.0
38720 Cervical lymphadenectomy (complete); unilateral	19.0	60	4.0
38721 bilateral	22.0	60	4.0

	Unit Value	Follow-up Days=	Basic Anes@
38724 Cervical lymphadenectomy (modified radical neck dissection)	BR		4.0
38740 Axillary lymphadenectomy; superficial	8.0	60	3.0
38745 complete	14.0	60	3.0
38760 Inguinofemoral lymphadenectomy, superficial, including Cloquet's node (separate procedure); unilateral	8.0	60	3.0
38761 bilateral	12.0	60	3.0
38765 Inguinofemoral lymphadenectomy, superficial, in continuity with pelvic lymphadenectomy, including external iliac hypogastric and obturator nodes (separate procedure); unilateral	20.0	60	5.0
38766 bilateral	24.0	60	5.0
38770 Pelvic lymphadenectomy, including external iliac, hypogastric, and obturator nodes (separate procedure); unilateral	12.0	60	6.0
38771 bilateral	20.0	60	6.0
38780 Retroperitoneal transabdominal lymphadenectomy, extensive, including pelvic, aortic, and renal nodes (separate procedure)	28.0	90	7.0

(For excision and repair of lymphedematous skin and subcutaneous tissue, see 15000, 15500-15730)

INTRODUCTION

38790 Injection procedure for lymphangiography; unilateral	3.0	7	
38791 bilateral	4.0	7	
38794 Cannulation, thoracic duct	BR		
38999 Unlisted procedure, hemic or lymphatic system	BR		3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-135, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-135, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-135, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-135, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-135, filed 1/30/74; Order 68-7, § 296-22-135, filed 11/27/68, effective 1/1/69.]

MEDIASTINUM AND DIAPHRAGM

WAC 296-22-140 Mediastinum.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
39000 Mediastinotomy with exploration, removal of foreign body or drainage; cervical approach	6.0	90	6.0
39010 transthoracic	12.0	90	12.0
39020 sternal split	22.0	90	12.0
39050 Removal of foreign body, mediastinum; cervical approach	8.0	90	6.0
39060 transthoracic	12.0	90	12.0
39070 sternal split	22.0	90	12.0

EXCISION

39200 Excision of mediastinal cyst	18.0	90	12.0
39220 Excision of mediastinal tumor ..	18.0	90	12.0
(For substernal thyroidectomy, see 60270)			
(For thymectomy, see 60520)			

ENDOSCOPY

39400 Mediastinoscopy, with or without biopsy	BR		3.0
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REPAIR

39499 Unlisted procedure, mediastinum	BR		3.0
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[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-140, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-140, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-140, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-140, filed 1/30/74; Order 68-7, § 296-22-140, filed 11/27/68, effective 1/1/69.]

WAC 296-22-141 Diaphragm.

	Unit Value	Follow-up Days=	Basic Anes@
REPAIR			
39501 Repair, laceration of diaphragm ..	BR		6.0
39502 Repair, paraesophageal hiatus hernia, transabdominal with or without fundoplasty, vagotomy, and/or pyloroplasty, except neonatal	BR		6.0
39503 Repair neonatal diaphragmatic hernia, including chest tube and ventral hernia	BR		7.0
(39500, 39510, Diaphragmatic hernia repair including fundoplasty have been deleted. To report, see 43324 or 43325)			
39520 Repair, diaphragmatic hernia (esophageal hiatal); transthoracic	17.0	90	11.0
39530 combined, thoracoabdominal	19.0	90	11.0
39531 combined, thoracoabdominal, with dilation of stricture (with or without gastroplasty)	BR		11.0
39540 Repair, diaphragmatic hernia (other than neonatal), traumatic; acute	BR		13.0
39541 chronic	BR		11.0
39545 Imbrication of diaphragm for eventration; paralytic	22.0	90	7.0
39547 nonparalytic	BR		7.0
39599 Unlisted procedure, diaphragm ..	BR		7.0

(For incidental repair of minor hiatal hernia, see WAC 296-22-010, item 7b)

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-141, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-141, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-141, filed 12/3/80, effective 3/1/81; Order

74-7, § 296-22-141, filed 1/30/74. Formerly WAC 296-22-070 (part).]

DIGESTIVE SYSTEM

WAC 296-22-146 Lips.

	Unit Value	Follow-up Days=	Basic Anes@
(For procedures on skin of lips, see 10000 et seq.)			
EXCISION			
40490 Biopsy of lip	0.6	7	3.0
40500 Vermilionectomy ("lip peel") with mucosal advancement	10.5	120	3.0
40510 Excision of lip; transverse wedge excision with primary closure	10.5	120	3.0
40520 V-excision of lesion with primary direct linear closure	6.0	120	3.0
40525 full thickness, reconstruction with local flap (e.g., Estlander or fan)	BR		3.0
40527 full thickness, reconstruction with cross lip flap (Abbe-Estlander)	BR		3.0
(For excision of mucous lesions, see 40810-40814)			
40530 Resection of lip, more than one-fourth, without reconstruction	6.0	120	3.0
(For lip reconstruction (see 13131 et seq.))			
REPAIR (CHEILOPLASTY)			
40650 Repair lip, full thickness; vermilion only	BR		3.0
40652 up to half vertical height	BR		3.0
40654 over one half vertical height, or complex	BR		3.0
40700 Plastic repair of cleft lip; primary, partial or complete, unilateral	16.0	90	6.0
40701 Primary bilateral, one stage procedure	20.0	90	6.0
40702 primary bilateral, one of two stages	14.0	90	6.0
40720 secondary, unilateral, by recreation of defect and reclosure	16.0	90	6.0
40740 secondary, bilateral (per major stage)	14.0	90	6.0
(40760 Cross lip pedicle flap repair of cleft lip (Abbe-Estlander type) has been deleted. To report, use 40527)			
40761 with cross lip pedicle flap (Abbe-Estlander type), including sectioning and inserting of pedicle	BR		6.0
(For repair cleft palate, see 42200 et seq.)			
(For other reconstructive procedures, see 14060, 14061, 15120-15261, 15515 et seq.)			
OTHER PROCEDURES			
40799 Unlisted procedure, lips	BR		3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-146, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-146, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-146, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-146, filed 1/30/74. Formerly WAC 296-22-145 (part).]

WAC 296-22-147 Vestibule of mouth.

	Unit Value	Follow-up Days=	Basic Anes@
The vestibule is the part of the oral cavity outside the dentoalveolar structures; it includes the mucosal and submucosal tissue of lips and cheeks.			
INCISION			
48000* Drainage of abscess, cyst, hematoma, vestibule of mouth; simple	0.4	0	4.0
48001 complicated	BR	0	4.0
48004* Removal of embedded foreign body; simple	0.4	0	4.0
48005 complicated	BR		4.0
48006 Incision of labial frenum (frenotomy)	Sv		4.0
EXCISION, DESTRUCTION			
48008 Biopsy, vestibule of mouth	0.6	0	4.0
48010 Excision of lesion of mucosa and submucosa; without repair	0.6	0	4.0
48012 with simple repair	1.0	0	4.0
48014 with complex repair	BR	0	4.0
48016 complex, with excision of and underlying muscle	BR	0	4.0
48018 Excision of mucosa as donor graft	BR	0	4.0
48019 Excision of frenum, labial or buccal (frenumectomy, frenulectomy, frenectomy)	BR	0	4.0
48020 Destruction of lesion or scar by physical methods (e.g., laser, thermal, cryo, chemical)	BR	0	4.0
REPAIR			
48030 Closure of laceration; 2.5 cm or less	0.4	0	4.0
48031 over 2.6 cm or complex	0.4	0	4.0
48040 Vestibuloplasty; anterior	BR	0	4.0
48042 posterior, unilateral	BR	0	4.0
48043 posterior, bilateral	BR	0	4.0
48044 entire arch	BR	0	4.0
48045 complex (including ridge extension, muscle repositioning)	BR	0	4.0
(For skin grafts, see 15000 et seq.)			
OTHER PROCEDURES			
48099 Unlisted procedure, vestibule of mouth	BR		4.0
[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-147, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-147, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-147, filed 12/3/80, effective 3/1/81.]			

WAC 296-22-150 Tongue, floor of mouth.

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@	
INCISION				41252*	Repair laceration of tongue, floor of mouth, over 2.6 cm or complex	BR	4.0	
*41000	Incision and drainage of intraoral abscess, cyst, or hematoma of tongue or floor of mouth; lingual	*0.4	0	3.0	OTHER PROCEDURES			
41005*	sublingual, superficial	0.4	0	4.0	41500	Fixation tongue, mechanical, other than suture (e.g., K-wire)	5.0 30 3.0	
41006	sublingual, deep, supramylohyoid	BR	0	4.0	41510	Suture tongue to lip for micrognathia (Douglas type procedure)	10.0 30 3.0	
41007	submental space	BR	0	4.0	41520	Frenoplasty (surgical revision of frenum, e.g., with Z-plasty)	BR 3.0	
41008	submandibular space	BR	0	4.0		(For frenotomy, see 40806, 41010)		
41009	masticator space	BR	0	4.0	41599	Unlisted procedure, tongue, floor of mouth	BR 3.0	
41010	Incision of lingual frenum (frenotomy)	0.4	15	4.0		[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-150, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-150, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-150, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-150, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-150, filed 1/30/74; Order 68-7, § 296-22-150, filed 11/27/68, effective 1/1/69.]		
41015	Incision and drainage of extraoral abscess, cyst, or hematoma of floor of mouth; sublingual	0.6	15	4.0				
41016	submental	BR		4.0				
41017	submandibular	BR		4.0				
41018	masticator space	BR		4.0				
	(For frenoplasty, see 41520)							
EXCISION					DENTOALVEOLAR STRUCTURES			
41100	Biopsy of tongue, anterior two-thirds	1.0	15	3.0	WAC 296-22-160 Palate, uvula.			
41105	posterior one-third	0.6	15	3.0		Unit Value	Follow-up Days=	Basic Anes@
41108	Biopsy, floor of mouth	1.0	15	4.0				
41110	Excision lesion of tongue; without closure	BR		4.0				
41112	with closure, anterior two-thirds	BR		4.0				
41113	with closure, posterior one-third	BR		4.0				
41114	with local tongue flap	BR		4.0				
	(List 41114 in addition to code 41112 or 41113)							
41115	Excision of lingual frenum (frenectomy)	BR		4.0				
41116	Excision lesion of floor of mouth	BR		4.0				
41120	Glossectomy; less than one-half tongue	8.0	120	6.0				
41130	Hemiglossectomy	12.0	120	6.0				
41135	partial, with unilateral radical neck dissection	20.0	120	6.0				
41140	complete or total, with or without tracheostomy, without radical neck dissection	18.0	120	6.0				
41145	complete or total, with or without tracheostomy, with unilateral radical neck dissection	26.0	120	6.0				
41150	composite procedure with resection floor of mouth and mandibular resection, without radical neck dissection	BR+		6.0				
41153	composite procedure with resection floor of mouth, with suprahyoid neck dissection ...	BR	120	6.0				
41155	composite procedure with resection floor of mouth, mandibular resection, and radical neck dissection (Commando type)	BR	120	6.0				
REPAIR								
41250*	Repair laceration 2.5 cm or less; floor of mouth and/or anterior two-thirds of tongue	1.0	0	4.0				
41251*	posterior one-third of tongue	1.0	0	4.0				

	Unit Value	Follow-up Days=	Basic Anes@
42160 Destruction of lesion, palate or uvula (thermal, cryo or chemical)	BR		3.0
REPAIR			
42180 Repair laceration of palate; up to 2 cm	BR		
42182 over 2 cm or complex	BR		
42200 Palatoplasty for cleft palate, soft and/or hard palate only	16.0	90	6.0
42205 Palatoplasty for cleft palate, with closure of alveolar ridge; soft tissue only	20.0	90	6.0
42210 with bone graft to alveolar ridge (includes obtaining graft)	22.0	90	6.0
(For obtaining bone graft by second surgeon, see WAC 296-22-010, item 5c and modifier -64)			
42215 Palatoplasty for cleft palate; major revision	16.0	90	6.0
42220 secondary lengthening procedure	17.0	90	6.0
42225 attachment pharyngeal flap ..	17.0	90	6.0
42226 Lengthening of palate, and pharyngeal flap	BR	90	6.0
42227 Lengthening of palate, with island flap	BR	90	6.0
42235 Repair anterior palate, including vomer flap	16.0	90	6.0
42250 Repair oroantral or oronasal fistula, up to 1 cm	BR		4.0
(For repair of larger defect, see 42215)			
42260 Repair nasolabial fistula	BR		4.0
42280 Maxillary impression for palatal prosthesis	BR		4.0
42281 Insertion of pin-retained palatal prosthesis	BR		4.0
(For repair cleft lip, see 40700 et seq.)			

OTHER PROCEDURES

42299 Unlisted procedure, palate, uvula	BR		4.0
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[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-160, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-160, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-160, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-160, filed 1/30/74; Order 68-7, § 296-22-160, filed 11/27/68, effective 1/1/69.]

WAC 296-22-165 Salivary glands and ducts.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
*42300 Drainage of abscess; parotid, simple	*1.4	0	3.0
42305 parotid, complicated	BR+		3.0
*42310 Drainage of abscess; submaxillary or sublingual, intraoral	*1.0	0	3.0
42320 submaxillary, external	3.0	0	3.0
42325 Fistulization sublingual salivary cyst (ranula);	BR		3.0
42326 with prosthesis	BR		

	Unit Value	Follow-up Days=	Basic Anes@
*42330 Sialolithotomy; submandibular (submaxillary), sublingual, or parotid, uncomplicated, intraoral	*0.6	0	3.0
42335 submandibular (submaxillary), complicated, intraoral	2.4	30	3.0
42340 parotid, extraoral or complicated intraoral	6.0	30	3.0

EXCISION

*42400 Biopsy salivary gland; needle ..	*0.8	0	
42405 incisional	2.0	30	3.0
42408 Excision sublingual salivary cyst (ranula)	BR		3.0
42409 Marsupialization sublingual salivary cyst (ranula)	BR		3.0

(For fistulization of sublingual salivary cyst, see 42325)

42410 Excision of parotid tumor or parotid gland; lateral lobe, without nerve dissection	6.0	60	3.0
42415 lateral lobe, with dissection and preservation of facial nerve	14.5	60	3.0
42420 total, with dissection and preservation of facial nerve	18.0	60	3.0
42425 total, en bloc removal with sacrifice of facial nerve	12.0	60	3.0
42426 total, with unilateral radical neck dissection	25.0	60	3.0
42440 Excision submandibular (submaxillary) gland	10.0	60	3.0
42450 Excision sublingual gland	5.5	60	3.0

REPAIR

42500 Plastic repair salivary duct, (sialodochoplasty); primary or simple	7.0	60	3.0
42505 secondary or complicated	BR+		3.0
42507 Parotid duct diversion, bilateral (Wilke type procedure);	BR		3.0
42508 with excision of one submandibular gland	BR		3.0
42509 with excision of both submandibular glands	BR		3.0
42510 with ligation of both submandibular (Wharton's) ducts	BR		3.0

OTHER PROCEDURES

42550 Injection procedure for sialography	0.4	0	
42600 Closure salivary fistula	BR+		3.0
*42650 Dilatation salivary duct	*0.3	0	3.0
42660* Dilatation and catheterization of salivary duct, with or without injection5		3.0
42665 Ligation salivary duct, intraoral ..	BR		3.0
42699 Unlisted procedure, salivary glands or ducts	BR		3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-165, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-165, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-165, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-165, filed 1/30/74; Order 68-7, § 296-22-165, filed 11/27/68, effective 1/1/69.]

	Unit Value	Follow-up Days=	Basic Anes@
43271 for balloon dilation of ampulla, biliary or pancreatic duct	BR		3.0
43272 for ablation of tumor or mucosal lesion (e.g., laser) . . .	BR		3.0

(For fluoroscopic monitoring and radiography, see 74330)

REPAIR

43300 Esophagoplasty; (plastic repair or reconstruction) cervical approach; without repair of tracheoesophageal fistula	BR		12.0
43305 with repair of tracheoesophageal fistula	22.0	90	6.0
43310 Esophagoplasty, (plastic repair or reconstruction) thoracic approach; without repair of tracheoesophageal fistula	30.0	90	12.0
43312 with repair of tracheoesophageal fistula	26.0	90	12.0
43320 Esophagogastrotomy (cardioplasty) with or without vagotomy and pyloroplasty; abdominal approach	22.0	90	6.0
43321 thoracic approach	22.0	90	11.0
43324 Esophagogastric fundoplasty (e.g., Nissen, Belsey IV, Hill procedures)	BR		6.0
43325 Esophagogastric fundoplasty with fundic patch (Thal-Nissen procedure)	BR		6.0

(For cricopharyngeal myotomy, see 43030)

43330 Esophagomyotomy (Heller type) with or without hiatal hernia repair; abdominal approach	19.0	90	6.0
43331 thoracic approach	19.0	90	11.0

(For esophagoduodenostomy or esophagojejunostomy with total gastric resection, see 43620)

43340 Esophagojejunostomy (without total gastrectomy); abdominal approach	24.0	90	6.0
43341 thoracic approach	24.0	90	11.0
43350 Esophagostomy, fistulization of esophagus, external; abdominal approach	14.0	90	6.0
43351 thoracic approach	14.0	90	11.0
43352 cervical approach	14.0	90	14.0

SUTURE

43400 Ligation, direct, esophageal varices	20.0	90	12.0
43401 Transection of esophagus with repair, for esophageal varices . . .	BR		
43410 Suture esophageal wound or injury; cervical approach	BR		7.0
43415 thoracic approach	19.0	90	12.0
43420 Closure esophagostomy or fistula; cervical approach	14.0	90	6.0
43425 thoracic approach	26.0	90	12.0

(For repair of esophageal hiatal hernia, see 39500 et seq.)

MANIPULATION

*43450 Dilation of esophagus, by unguided sound or bougie, single or multiple; initial session	*0.6	0	3.0
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*43451 subsequent session	*0.6	0	3.0
43453 Dilation of esophagus, over guide wire or string	3.0	15	3.0
(For dilation with direct visualization, see 43220)			
43455 Dilation of esophagus by balloon or Stark dilator;	4.0	15	3.0
43456 retrograde	BR		3.0
43460 Esophagogastric tamponade, with balloon (Sengstaaken type)	Sv. & BR		
43499 Unlisted procedure, esophagus . .	BR		3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-180, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-180, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-180, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-180, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-180, filed 1/30/74; Order 68-7, § 296-22-180, filed 11/27/68, effective 1/1/69.]

WAC 296-22-190 Stomach.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
43500 Gastrotomy; with exploration or foreign body removal	12.0	45	5.0
43501 with suture repair of bleeding ulcer or esophagogastric laceration	BR		5.0
43510 with esophageal dilation and insertion of plastic tubes	BR		5.0
43520 Pyloromyotomy, cutting of pyloric muscle (Fredet-Ramstedt type operation)	10.0	45	6.0

EXCISION

43600 Biopsy of stomach; by capsule, tube, peroral (one or more specimens)	3.0	0	
43605 by laparotomy	12.0	45	5.0
43610 Local excision of ulcer or tumor	14.5	45	6.0
43620 Gastrectomy, total; including intestinal anastomosis	28.0	90	7.0
43625 with repair by intestinal transplant	34.0	90	7.0
43630 Hemigastrectomy or distal subtotal gastrectomy including pyloroplasty, gastroduodenostomy or gastrojejunostomy; without vagotomy	19.0	60	6.0
43635 with vagotomy, any type	21.0	60	6.0
43638 Hemigastrectomy or proximal subtotal gastrectomy, thoracic or abdominal approach	19.0	60	6.0
43640 Vagotomy including pyloroplasty, with or without gastrotomy truncal or selective	17.0	60	6.0

(For pyloroplasty, see 43800)

(For vagotomy, see 64752-64760)

43641 parietal cell (highly selective)	BR		6.0
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ENDOSCOPY

(For upper gastrointestinal endoscopy, see 43234-43258)

	Unit Value	Follow- up Days=	Basic Anes@
(43700 has been deleted. To report, use 43235)			
(43702 has been deleted. To report, use 43239)			
(43709 has been deleted. To report, use 43247)			
(43711 has been deleted. To report, use 43251)			
(43712 has been deleted. To report, use 43255)			
(43714 has been deleted. To report, use 43258)			
(For esophagogastroduodenoscopy, see 43235-43264)			

INTRODUCTION

43750 Percutaneous placement of gastrostomy tube	BR		5.0
*43760 Change of gastrostomy tube	BR		5.0
(43765 has been deleted)			

SUTURE

43800 Pyloroplasty	13.0	45	5.0
(For pyloroplasty and vagotomy, see 43640)			
43810 Gastroduodenostomy	14.0	45	5.0
43820 Gastrojejunostomy	14.0	45	5.0
43825 with vagotomy any type	18.0	45	6.0
43830 Gastrostomy, temporary (tube, rubber, or plastic) (separate procedure);	13.0	45	5.0
43831 neonatal, for feeding	8.0	30	5.0
(For change of gastrostomy tube, see 43760)			
43832 Gastrostomy, permanent, with construction of gastric tube	16.0	45	5.0
(43834 has been deleted, use 43246)			
43840 Gastrorrhaphy, suture of perforated duodenal or gastric ulcer, wound, or injury	13.0	45	6.0
43844 Gastric bypass for morbid obesity			
	NONCOVERED PROCEDURE		
43845 Gastric stapling for morbid obesity			
	NONCOVERED PROCEDURE		
43846 Gastric bypass with Roux-en-Y gastroenterostomy for morbid obesity			
	NONCOVERED PROCEDURE		
43850 Revision of gastroduodenal anastomosis (gastroduodenostomy) with reconstruction, without vagotomy	20.0	60	5.0
43855 with vagotomy	23.0	60	6.0
43860 Revision of gastrojejunal anastomosis (gastrojejunostomy) with reconstruction; with or without partial gastrectomy or bowel resection; without vagotomy	20.0	60	5.0
43865 with vagotomy	23.0	60	6.0
43870 Closure of gastrostomy, surgical	12.0	45	5.0

43880 Closure of gastrocolic fistula	BR		5.0
43885 Anterior gastropexy for hiatal hernia (separate procedure)	BR		5.0
43999 Unlisted procedure, stomach	BR		5.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-190, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-190, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-190, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-190, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-190, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-190, filed 1/30/74; Order 68-7, § 296-22-190, filed 11/27/68, effective 1/1/69.]

WAC 296-22-195 Intestines (except rectum).

	Unit Value	Follow- up Days=	Basic Anes@
INCISION			
(44000 has been deleted)			
44005 Enterolysis (freeing of intestinal adhesion) for acute bowel obstruction	14.5	90	6.0
44010 Duodenotomy	14.5	60	7.0
44015 Needle catheter jejunostomy for enteral hyperalimentation (list separately in addition to primary procedure)	BR		4.0
44020 Enterotomy with exploration or foreign body removal; small bowel, other than duodenum	14.5	60	4.0
44021 for decompression (e.g. Baker tube)	BR	60	4.0
44025 Colotomy	15.0	60	4.0
44040 Exteriorization of intestine (Mikulicz resection with crushing of spur)	18.0	60	5.0
44050 Reduction of volvulus, intussusception, internal hernia, by laparotomy	14.0	90	5.0
44055 Correction of malrotation by lysis of duodenal bands and/or reduction of midgut volvulus (e.g., Ladd procedure)	BR	90	5.0
(44060 has been deleted, use 44799)			
EXCISION			
44100 Biopsy of intestine by capsule, tube, peroral (one or more specimens)	3.0	0	
44110 Excision of one or more lesions of small or large bowel not requiring anastomosis, exteriorization, or fistulization; single enterotomy	16.0	60	4.0
44111 multiple enterotomies	BR		4.0
44115 Excision colonic diverticulum	BR		
44120 Enterectomy, resection of small intestine; with anastomosis	17.0	60	6.0
44125 with double-barrel enterostomy	14.0	60	6.0
44130 Enteroenterostomy, anastomosis of intestine; (separate procedure)	14.5	90	5.0
44131 intestinal bypass for morbid obesity noncovered procedure			

Surgical Fees

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	Unit Value	Follow-up Days=	Basic Anes@
44680 Intestinal plication, (separate procedure)	20.0	90	6.0
44799 Unlisted procedure, intestine ...	BR		5.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-195, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-195, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-195, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-195, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-195, filed 1/30/74; Order 68-7, § 296-22-195, filed 11/27/68, effective 1/1/69.]

WAC 296-22-210 Rectum.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
45000 Transrectal drainage of pelvic abscess	3.0	15	3.0
45005 Incision and drainage of submucous abscess, rectum	4.5	30	3.0
45020 Incision and drainage of deep supralevator, pelvirectal or retrorectal abscess (see also 46050, 46060)	4.8	30	3.0
EXCISION			
45100 Biopsy of anorectal wall, anal approach (e.g., congenital megacolon)	4.0	15	3.0
(45105 has been deleted)			
(For endoscopic biopsy, see 45305)			
45108 Anorectal myomectomy	BR		3.0
45110 Proctectomy; complete, combined abdominoperineal, with colostomy, one or two stages	26.0	90	7.0
45111 partial resection of rectum ...	24.0	90	7.0
45112 Proctectomy, combined abdominoperineal, pull-through procedure, one or two stages	28.0	90	7.0
45114 Proctectomy, partial, with anastomosis; abdominal and transacral approach, one or two stages	30.0	90	7.0
45116 transacral approach only (Kraske type)	28.0	90	7.0
45120 Proctectomy, complete, for congenital megacolon (Swenson Duhamel, or Soave type operation)	26.0	90	7.0
45130 Excision of rectal procidentia, with anastomosis; perineal approach	14.5	90	4.0
45135 abdominal and perineal approach	26.0	90	6.0
45150 Division of stricture of rectum ..	BR		3.0
45160 Excision of rectal tumor by proctotomy, transacral or transcoccygeal approach	19.0	90	3.0
45170 Excision of rectal tumor, simple, transanal approach	BR		3.0
45180 Excision and/or electrodesiccation of malignant tumor of rectum, transanal approach; palliative	BR		3.0

	Unit Value	Follow-up Days=	Basic Anes@
45181 therapeutic	BR		3.0
ENDOSCOPY			
45300 Proctosigmoidoscopy; diagnostic (separate procedures)	0.6	0	3.0
45302 for collection of specimen by brushing or washing for cytology	1.0	7	3.0
45303 for dilation, direct, instrumental	1.5	7	3.0
45305 for biopsy,	1.2	7	3.0
45307 for removal of foreign body ..	1.0	7	3.0
45310 for removal of polyp or papilloma	1.4	7	3.0
45315 with removal of multiple excrescences, papillomata or polyps	1.8	7	3.0
45317 for control of hemorrhage (e.g., electrocoagulation, laser photocoagulation)	2.0	7	3.0
(45319 Endoscopic retrograde lavage has been deleted. To report, use 45999)			
45321 for decompression of volvulus .	BR		3.0
(45325 colonoscopy has been renumbered 45355 without change in terminology)			
45330 Sigmoidoscopy, flexible fiberoptic; diagnostic	0.8	15	3.0
45331 for biopsy and/or collection of specimen by brushing or washing	1.4	15	3.0
45332 for removal of foreign body ..	1.4	15	3.0
45333 with removal of polyp(s)	1.8	15	3.0
45334 for control of hemorrhage (e.g., electrocoagulation, laser photocoagulation)	BR		
45336 for ablation of tumor or mucosal lesion (e.g., electrocoagulation, laser photocoagulation)	BR		3.0
45355 Colonoscopy, with standard sigmoidoscope, transabdominal via colotomy, single or multiple .	3.0	7	3.0
45360 Colonoscopy, fiberoptic, beyond 25 cm to splenic flexure; diagnostic procedure	5.0	7	3.0
45365 for biopsy and/or collection of specimen by brushing or washing	4.0	7	3.0
45367 with removal of foreign body .	5.0	7	3.0
45368 for control of hemorrhage (e.g., electrocoagulation)	6.0	7	3.0
45369 for ablation of tumor or mucosal lesion (e.g., electrocoagulation, laser photocoagulation)	BR		3.0
45370 with removal of polypoid lesion(s)	6.0	7	3.0
(45371 Colonoscopic retrograde lavage has been deleted. To report, use 44799)			
45372 for decompression of volvulus .	BR		3.0
45378 Colonoscopy, fiberoptic, beyond splenic flexure; diagnostic procedure	6.0	7	3.0
45379 with removal of foreign body .	7.0	7	3.0
45380 with biopsy and/or collection of specimen for cytology	6.0	7	3.0

	Unit Value	Follow-up Days=	Basic Anes@
45382 for control of hemorrhage	7.0	7	3.0
45383 for ablation of tumor or mucosal lesion (e.g., electrocoagulation, laser photocoagulation)	BR		3.0
45385 for removal of polypoid lesion(s)	7.0	7	3.0
(45386 Colonoscopic retrograde lavage has been deleted. To report, use 44799)			
(For small bowel and stomal endoscopy, see 44360-44393)			

REPAIR

45500 Proctoplasty, for stenosis	10.0	90	3.0
45505 for prolapse of mucous membrane	11.0	90	3.0
45520 Perirectal injection of sclerosing solution for prolapse; office	1.0	0	
45521 hospital	4.0	30	3.0
45540 Proctopexy for prolapse, abdominal approach	18.0	90	4.0
45541 perineal approach	18.0	90	3.0
45550 proctopexy combined with sigmoid resection, abdominal approach	22.0	90	5.0
45560 Repair of rectocele (separate procedure)	24.0	90	5.0
(For repair of rectocele with posterior colporrhaphy, see 57250)			

SUTURE

45800 Closure of rectovesical fistula; . .	20.0	90	5.0
45805 with colostomy	22.0	90	5.0
45820 Closure of rectourethral fistula . .	20.0	90	3.0
45825 with colostomy	22.0	90	4.0
(For rectovaginal fistula closure, see 57300-57308)			

MANIPULATION

*45900 Reduction of procidentia (separate procedure) under anesthesia	*0.6	0	3.0
45905* Dilation of anal sphincter (separate procedure) under anesthesia other than local	BR		3.0
45910 Dilation of rectal stricture (separate procedure) under anesthesia other than local	BR		3.0
45915* Removal of fecal impaction or foreign body (separate procedure) under anesthesia	BR		3.0
45999 Unlisted procedure, rectum	BR		3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-210, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-210, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-210, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-210, filed 1/30/74; Order 68-7, § 296-22-210, filed 11/27/68, effective 1/1/69.]

WAC 296-22-215 Anus.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
*46000 Fistulotomy, subcutaneous	*0.6	0	3.0
(For fistulectomy, see 46060, 46270-46285)			
*46030 Removal of seton, other marker	*0.6	0	
(46032 has been deleted, use 46999)			
46040 Incision and drainage of ischiorectal and/or perirectal abscess (separate procedure)	2.4	15	3.0
46045 Incision and drainage of intramural, intramuscular or submucosal abscess, transanal, under anesthesia	2.4	15	3.0
*46050 Incision and drainage, perianal abscess, superficial (see also 45020, 46060)	*0.48	0	3.0
46060 Incision and drainage of ischiorectal or intramural abscess with fistulectomy, submuscular (see also 45020)	9.5	90	3.0
46070 Incision, anal septum (infant)	1.2	0	3.0
(For anoplasty, see 46700-46705)			
*46080 Sphincterotomy, anal, division of anal sphincter (separate procedure)	*1.2	0	3.0
46083 Incision of thrombosed hemorrhoid, external	BR		3.0
EXCISION			
46200 Fissurectomy, with or without sphincterotomy	4.8	90	3.0
46210 Cryptectomy, single	1.4	30	3.0
46211 multiple, (separate procedure)	7.0	90	3.0
46220 Papillectomy or excision of single tab, anus (separate procedure) . .	0.6	15	3.0
46221 Hemorrhoidectomy, by simple ligature (rubber band)	BR		3.0
46230 Excision of external hemorrhoid tags and/or multiple papillae . .	1.2	15	3.0
46250 Hemorrhoidectomy, external, complete	4.8	90	3.0
46255 Hemorrhoidectomy, internal and external, simple;	7.0	90	3.0
46257 with fissurectomy	BR		3.0
46258 with fistulectomy, with or without fissurectomy	BR		3.0
46260 Hemorrhoidectomy, internal and external, complex or extensive; . .	10.0	90	3.0
46261 with fissurectomy	BR		3.0
46262 with fistulectomy, with or without fissurectomy	BR		3.0
46270 Fistulectomy; subcutaneous	2.4	30	3.0
46275 submuscular	9.5	90	3.0
46280 complex or multiple	BR+		3.0
46285 second stage	2.0	30	3.0
*46320 Enucleation or excision of external thrombotic hemorrhoid	*0.72	0	3.0
INTRODUCTION			
*46500 Injection of sclerosing solution, hemorrhoids	*0.4	0	3.0
(46510, 46530 have been deleted, use 46999)			

Surgical Fees

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	Unit Value	Follow-up Days=	Basic Anes@
ENDOSCOPY			
*46600 Anoscopy; diagnostic (separate procedure)	*0.32	0	3.0
46602 for collection of specimen by brushing or washing for cytology	0.5	0	3.0
46604 for dilation, direct, instrumental	0.7	0	3.0
46606 for biopsy	1.0	0	3.0
46608 for removal of foreign body ..	1.5	0	3.0
46610 for removal of polyp	1.5	0	3.0
46612 for multiple polyp removal ...	BR		3.0
46614 with coagulation for control of hemorrhage and/or fulguration of mucosal lesion	BR		3.0
REPAIR			
46700 Anoplasty, plastic operation for stricture; adult	9.0	90	3.0
46705 infant	10.0	30	4.0
(For simple incision of anal septum, see 46070)			
46715 Repair of congenital anovaginal fistula ("cut-back" type procedure)	12.0	90	4.0
46716 Perineal transplant of anovaginal fistula	14.0	90	4.0
46730 Construction of anus for congenital absence; perineal or sacrococcygeal approach	16.0	90	5.0
46735 combined abdominal and perineal approach	20.0	90	7.0
46740 Construction of anus for congenital absence, with repair of urinary fistula	22.0	90	7.0
46750 Sphincteroplasty, anal, for incontinence, or prolapse; adult	10.0	90	3.0
46751 child	12.0	90	4.0
46753 Graft (Thiersch operation) for rectal incontinence and/or prolapse	BR		4.0
46754 Removal of Thiersch wire or suture	BR		4.0
46760 Sphinteroplasty, anal, for incontinence, adult, muscle transplant	BR		4.0
DESTRUCTION			
*46900 Destruction of lesion(s), anus (e.g., condyloma, papilloma, molluscum contagiosum, herpetic vessel, simple chemical	*0.48	0	
*46910 electrodesiccation	*0.8	0	3.0
46916 cryosurgery	BR	0	3.0
46917 laser surgery	BR		
46922 surgical excision	BR		3.0
46924 Destruction of lesion(s), anus (e.g., condyloma, papilloma, molluscum, contagiosum, herpetic vessel) extensive, any method	BR		3.0
(46930-46933 have been deleted, use 46916, 46924)			
46934 Destruction of hemorrhoids, any method; internal	BR		
46935 external	BR		
46936 internal and external	BR		
46937 Cryosurgery of rectal tumor; benign	BR		

	Unit Value	Follow-up Days=	Basic Anes@
46938 malignant	BR		3.0
46940 Curettage or cauterization of anal fissure, including dilation of anal sphincter (separate procedure); initial	BR		3.0
46942 subsequent	BR		
SUTURE			
46945 Ligation of internal hemorrhoids; single procedure	BR		3.0
46946 multiple procedures	BR		3.0
OTHER PROCEDURES			
46999 Unlisted procedure, anus	BR		3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-215, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-215, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-215, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-215, filed 1/30/74; Order 68-7, § 296-22-215, filed 11/27/68, effective 1/1/69.]

WAC 296-22-220 Liver.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
*47000 Biopsy of liver, percutaneous needle	*1.4	0	3.0
(For CT guidance, see 76360, 76361; for ultrasonic guidance, see 76942, 76943)			
47010 Hepatotomy for drainage of abscess or cyst, one or two stages ..	BR		3.0
EXCISION			
47100 Biopsy of liver, wedge (separate procedure)	10.0	45	4.0
47120 Hepatectomy, resection of liver; partial lobectomy	19.0	45	10.0
47125 total left lobectomy	BR		13.0
47130 total right lobectomy	BR		13.0
47133 Donor hepatectomy, with preparation and maintenance of homograft	BR		13.0
47135 Liver transplant, with or without recipient hepatectomy	BR		15.0
REPAIR			
47300 Marsupialization of cyst or abscess of liver	14.5	60	6.0
SUTURE			
47350 Hepatorrhaphy, suture of liver wound or injury; simple	14.0	45	4.0
47355 with common duct or gallbladder drainage	18.0	45	7.0
47360 complex, with or without hepatic artery ligation	BR		12.0
47399 Unlisted procedure, liver	BR		3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-220, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-220, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-220, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-220, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-

22-220, filed 1/30/74; Order 68-7, § 296-22-220, filed 11/27/68, effective 1/1/69.]

WAC 296-22-225 Biliary tract.

	Unit Value	Follow-up Days=	Basic Anes@
47400 Hepaticotomy or hepaticostomy with exploration, drainage, or removal of calculus	20.0	45	6.0
47420 Choledochotomy or choledochostomy with exploration, drainage, or removal of calculus, with or without cholecystotomy;	17.0	45	5.0
47425 with transduodenal sphincterotomy or sphincteroplasty	19.0	45	6.0
47440 Duodenocholedochotomy, transduodenal choledocholithotomy . .	19.0	45	6.0
47460 Transduodenal sphincterotomy or sphincteroplasty (separate procedure)	19.0	45	6.0
47480 Cholecystotomy or cholecystostomy with exploration, drainage or removal of calculus (separate procedure)	12.0	45	5.0
47490 Percutaneous cholecystostomy . .	BR		

INTRODUCTION

47500 Injection procedure for percutaneous transhepatic cholangiography	1.6	0	
47510 Introduction of percutaneous transhepatic catheter or stent for biliary drainage	BR		
47525 Change of percutaneous biliary drainage catheter	BR		5.0
47530 T-tube revision and/or reinsertion	BR		5.0

(For radiologic guidance, see 75981, 75983)

ENDOSCOPY

47550 Biliary endoscopy, intraoperative (choledochoscopy)	BR		5.0
(Use 47550 with either 47420 or 47610)			
47552 Biliary endoscopy, percutaneous via T-tube or other tract; diagnostic	BR		5.0
47553 for biopsy and/or collection of specimen by brushing or washing	BR		5.0
47554 for removal of stone(s)	BR		5.0
47555 for dilation of biliary duct stricture	BR		5.0

(For peroral biliary endoscopic procedure see 43260-43272)

EXCISION

47600 Cholecystectomy;	14.5	45	5.0
47605 with cholangiography	15.0	45	5.0
47610 Cholecystectomy with exploration of common duct	17.0	45	6.0
(47611 has been deleted. To report, use 47610 with 47550)			
47612 with choledochostomy	BR	45	6.0
47620 with transduodenal sphincterotomy or sphincteroplasty [sphincteroplasty], with or			

without cholangiography	20.0	45	6.0
47630 Biliary duct stone extraction, percutaneous via t-tube tract (e.g., Burhenne technique)	BR		5.0
(For fluoroscopic procedure, see 74327)			
47700 Exploration for congenital atresia of bile ducts, without repair, with or without liver biopsy, with or without cholangiography	14.5	45	6.0

REPAIR

47720 Cholecystoenterostomy; direct . .	14.5	60	5.0
47721 with gastroenterostomy	16.0	60	6.0
47740 Roux-en-y	16.0	60	6.0
47760 Anastomosis, direct, of extrahepatic biliary ducts and gastrointestinal tract	20.0	90	6.0
47765 Anastomosis, direct, of intrahepatic ducts and gastrointestinal tract	BR		6.0
47780 Anastomosis, Roux-en-y of extrahepatic biliary ducts and gastrointestinal tract	22.0	90	6.0
47800 Reconstruction, plastic, of extrahepatic biliary ducts with end-to-end anastomosis	20.0	90	6.0
47801 Placement of choledochal stent . .	BR		5.0
47810 Implantation of biliary istulous tract into stomach or intestine . .	BR		5.0

OTHER PROCEDURES

(47850, 47855 have been deleted, use 47999)			
47999 Unlisted procedure, biliary tract .	BR		5.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-225, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-225, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-225, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-225, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-225, filed 1/30/74; Order 68-7, § 296-22-225, filed 11/27/68, effective 1/1/69.]

WAC 296-22-230 Pancreas.

	Unit Value	Follow-up Days=	Basic Anes@
48000 Drainage of abdomen for pancreatitis	13.0	60	5.0
48020 Removal of pancreatic calculus . .	20.0	60	6.0

EXCISION

48100 Biopsy of pancreas (separate procedure)	14.0	60	5.0
48102 Biopsy of pancreas, needle, percutaneous	2.5	7	
(For CT guidance, see 76360, 76361; for ultrasonic guidance, see 76942, 76943)			
48120 Excision of lesion of pancreas (e.g., cyst, adenoma)	17.0	60	6.0
48140 Pancreatectomy, distal subtotal, with or without splenectomy; . .	20.0	60	6.0

	Unit Value	Follow-up Days=	Basic Anes@
48145 with pancreaticojejunostomy	22.0	60	6.0
48148 Excision of ampulla of Vater, simple	BR		6.0
48150 Pancreatectomy, proximal subtotal, with pancreaticoduodenostomy (Whipple type procedure and pancreatic jejunostomy)	34.0	60	6.0
48151 Pancreatectomy, near-total, with preservation of duodenum (Child type procedure)	BR		
48155 Pancreatectomy, total;	34.0	60	6.0
48160 with transplantation	BR		6.0
48180 Pancreaticojejunostomy side-to-side anastomosis, Puestow type operation, (separate procedure)	24.0	60	6.0

ENDOSCOPY

(For peroral pancreatic endoscopic procedures see 43260-43272)

REPAIR

48500 Marsupialization of cyst of pancreas	14.5	60	6.0
48520 Internal anastomosis of pancreatic cyst to gastrointestinal tract; direct	17.0	60	6.0
48540 Roux-en-y	19.0	60	6.0
48999 Unlisted procedure, pancreas	BR		6.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-230, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-230, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-230, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-230, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-230, filed 1/30/74; Order 68-7, § 296-22-230, filed 11/27/68, effective 1/1/69.]

WAC 296-22-235 Abdomen, peritoneum and omentum.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
49000 Exploratory laparotomy, exploratory celiotomy (separate procedure) (see WAC 296-22-010, item 7b)	10.0	45	6.0
49002 Reopening of recent laparotomy incision for exploration; removal of hematoma, control of bleeding	10.0	45	7.0
49010 Exploration, retroperitoneal area (separate procedure)	10.0	45	6.0
49020 Drainage of peritoneal abscess or localized peritonitis, exclusive of appendiceal abscess, transabdominal	11.0	45	6.0
(For appendiceal abscess, see 44900)			
49040 Drainage of subdiaphragmatic or subphrenic abscess	12.0	45	7.0
49060 Drainage of retroperitoneal abscess	11.0	45	7.0
*49080 Peritoneocentesis, abdominal paracentesis; initial	*0.8	0	4.0
*49081 subsequent	*0.6	0	4.0

49085 Removal of peritoneal foreign body	BR		6.0
(For lysis of intestinal adhesions, see 44000)			

EXCISION

*49180 Biopsy, abdominal or retroperitoneal mass, needle, percutaneous	2.5	7	
(For CT guidance, see 76360, 76361, 76365, 76366; for ultrasonic guidance, see 76942, 76943)			
49200 Excision or destruction by any method of intra-abdominal or retroperitoneal tumors or cysts or endometriomas	14.0	60	5.0
49201 extensive	BR		5.0
49220 Staging celiotomy (laparotomy) for Hodgkin's disease or lymphoma (includes splenectomy, needle or open biopsies of both liver lobes, possibly also removal of abdominal nodes, abdominal node and/or bone marrow biopsies, ovarian repositioning)	BR	45	5.0
49250 Umbilectomy, omphalectomy, excision of umbilicus (separate procedure)	BR		5.0
49255 Omentectomy, epiploectomy, resection of omentum (separate procedure)	BR		5.0

ENDOSCOPY

49300 Peritoneoscopy; without biopsy	4.0	15	3.0
49301 with biopsy	6.0	10	5.0
49302 Peritoneoscopy with guided transhepatic cholangiography; without biopsy	7.0	10	5.0
49303 with biopsy	8.0	10	5.0
(For sterilization by laparoscopic technique, see 58982)			

INTRODUCTION

*49400 Pneumoperitoneum; initial	*1.0	0	3.0
*49401 subsequent	*0.6	0	3.0
*49420 Insertion of intraperitoneal cannula or catheter for drainage or dialysis; temporary	*1.0	0	3.0
49421 permanent	BR		3.0
49425 Peritoneal-venous shunt (e.g., LeVeen shunt)	BR		3.0
49426 Revision of peritoneal-venous shunt	BR		3.0
(For shunt patency test, see 78291)			
(49430, 49440 have been deleted, use 49999)			

REPAIR

HERNIOPLASTY, HERNIORRHAPHY, HERNIOTOMY

(For reduction and repair of intra-abdominal hernia, see 44050)
 (For debridement of abdominal wall, see 11042, 11043)
 (All codes for bilateral procedures in hernia repair have been

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-235, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-235, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-235, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-235, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-235, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-235, filed 1/30/74; Order 68-7, § 296-22-235, filed 11/27/68, effective 1/1/69.]

	Unit Value	Follow-up Days=	Basic Anes@
deleted. To report, add modifier -50)			
49500 Repair inguinal hernia, under age 5 years, with or without hydrocelectomy; unilateral	7.0	45	3.0
49505 Repair inguinal hernia, age 5 or over; unilateral	9.0	45	4.0
49510 Repair of inguinal hernia, age 5 or over; unilateral, with orchiectomy, with or without implantation of prosthesis	9.5	45	3.0
49515 with excision of hydrocele or spermatocele	9.5	45	3.0
49520 recurrent	10.0	45	4.0
49525 sliding	10.0	45	3.0
49530 incarcerated	12.0	45	3.0
49535 strangulated	12.0	45	3.0
49540 Repair lumbar hernia	10.0	45	3.0
49550 Repair femoral hernia, groin incision; unilateral	9.0	45	3.0
49552 Repair femoral hernia, Henry approach; unilateral	10.0	45	3.0
49555 Repair femoral hernia, recurrent, any approach	10.0	45	3.0
49560 Repair ventral hernia (separate procedure);	11.0	45	6.0
49565 recurrent	12.0	45	3.0
49570 Repair epigastric hernia, peritoneal fat (separate procedure); simple	3.0	45	3.0
49575 complex	7.0	45	3.0
49580 Repair umbilical hernia; under age 5 years	7.0	45	3.0
49581 age 5 or over	8.5	45	4.0
49590 Repair spigelian hernia	9.0	45	3.0
49600 Repair of omphalocele; small, with primary closure	9.5	45	6.0
49605 large or gastroschisis, with or without prosthesis	14.5	60	9.0
49606 with staged closure of prosthesis, reduction in operating room, under anesthesia	BR		9.0
49610 Repair of omphalocele (Gross type operation); first stage	12.0	60	8.0
49611 second stage	12.0	60	7.0
(For diaphragmatic or hiatal hernia repair, see 39500-39531)			
49630 Reduction of torsion, omentum	BR		5.0
49635 Omentopexy for establishing collateral circulation in portal obstruction	BR		5.0
49640 Omentoplasty (omental flap reconstruction for transfer of omentum with intact blood supply to thorax, neck or axilla)	BR		5.0

URINARY SYSTEM

(For supply of anticarcinogenic agents, use 99070 in addition to primary procedure)

WAC 296-22-245 Kidney.

INCISION

(For retroperitoneal exploration, abscess, tumor, or cyst, see 49010, 49060, 49200, 49201)

	Unit Value	Follow-up Days=	Basic Anes@
50010 Renal exploration, not necessitating other specific procedures	17.0	90	6.0
50020 Drainage of perirenal or renal abscess (separate procedure)	14.0	90	5.0
50040 Nephrostomy, nephrotomy with drainage	20.0	90	5.0
50045 Nephrotomy, with exploration	20.0	90	5.0
(For renal endoscopy performed in conjunction with this procedure, see 50570-50580)			
50060 Nephrolithotomy; removal of calculus	20.0	90	5.0
50065 secondary surgical operation for calculus	24.0	90	5.0
50070 complicated by congenital kidney abnormality	24.0	90	5.0
50075 removal of large (staghorn calculus filling renal pelvis and calyces including anatomic pyelolithotomy)	26.0	90	5.0
50080 Percutaneous nephrostolithotomy or pyelostolithotomy, with or without dilation, endoscopy, lithotripsy, stenting or basket extraction; up to 2 cm	BR		5.0
50081 over 2 cm	BR		5.0
(For establishment of nephrostomy without nephrostolithotomy, see 50040, 50395 or 52334)			
50100 Transection or repositioning of aberrant renal vessels (separate procedure)	17.0	90	5.0
50120 Pyelotomy; with exploration	20.0	90	5.0
(For renal endoscopy performed in conjunction with this procedure, see 50570-50580)			
50125 with drainage, pyelostomy	20.0	90	5.0
50130 with removal of calculus (pyelolithotomy, pelviolithotomy including coagulum pyelolithotomy)	20.0	90	5.0
50135 complicated (e.g., secondary operation, congenital kidney abnormality)	24.0	90	5.0

SUTURE

49900 Suture, secondary, of abdominal wall for evisceration or dehiscence	6.0	30	5.0
(For suture of ruptured diaphragm, see 39540-39541)			
(For debridement of abdominal wall, see 11042, 11043)			
49910 Suture of omentum, omentorrhaphy for wound or injury	BR		5.0
49999 Unlisted procedure, abdomen, peritoneum and omentum	BR		5.0

Surgical Fees

296-22-245

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
EXCISION				percutaneous	2.5	7	
(For excision of retroperitoneal tumor or cyst, see 49200, 49201)				(For CT guidance, see 76365, 76366)			
*50200 Renal biopsy, percutaneous; by trocar or needle	2.4	7		(For fluoroscopic guidance, see 76000; for ultrasonic guidance, see 76938, 76939)			
(For CT guidance, see 76360, 76361)				(For fine needle aspiration, preparation, and interpretation of smears, see 88170-88173)			
(For fluoroscopic guidance, see 76000; for ultrasonic guidance, see 76942, 76943)				50392 Introduction of intracatheter or catheter into renal pelvis for drainage and/or injection, percutaneous	2.5	7	
(For fine needle aspiration, preparation, and interpretation of smears, see 88170-88173)				(For fluoroscopic guidance see 76000; for ultrasonic guidance see 76938)			
50205 by surgical exposure of kidney	8.0	30	5.0	(For radiographic procedure, see 74475, 74476)			
50220 Nephrectomy, including partial ureterectomy, any approach including rib resection;	20.0	90	5.0	50393 Introduction of ureteral catheter or stent into ureter through renal pelvis for drainage and/or injection, percutaneous	2.5	7	3.0
50225 complicated because of previous surgery on same kidney	24.0	90	5.0	(For fluoroscopic guidance, see 76000; for ultrasonic guidance, see 76938)			
50230 radical, with regional lymphadenectomy	26.0	90	5.0	(For radiographic procedure, see 74480, 74481)			
50234 Nephrectomy with total ureterectomy and bladder cuff; through same incision	24.0	90	5.0	50394 Injection procedure for pyelography (as nephrostogram, pyelostogram, antegrade pyeloureterograms) through nephrostomy or pyelostomy tube, or indwelling ureteral catheter (separate procedure)	.3	0	
50236 through separate incision	24.0	90	5.0	50395 Introduction of guide into renal pelvis and/or ureter with dilation to establish nephrostomy tract, percutaneous	BR		3.0
50240 Nephrectomy, partial	24.0	90	5.0	(For nephrostolithotomy, see 50080, 50081)			
50280 Excision or unroofing of cyst(s) of kidney	18.0	90	5.0	(For retrograde percutaneous nephrostomy, use 52334)			
50290 Excision of perinephric cyst	18.0	90	5.0	(For endoscopic surgery, see 50551-51561)			
RENAL TRANSPLANTATION				50396 Manometric studies through nephrostomy or pyelostomy tube, or indwelling ureteral catheter	.4	0	
(For dialysis, see 90941-90999)				50398* Change of nephrostomy or pyelostomy tube	.3	0	
50300 Donor nephrectomy, with preparation and maintenance of homograft; from cadaver donor, unilateral or bilateral	BR+			REPAIR			
50320 from living donor, unilateral	24.0	90	5.0	50400 Pyeloplasty; (Foley Y-pyeloplasty), plastic operation on renal pelvis, with or without plastic operation on ureter or nephropexy, nephrostomy, pyelostomy, or uretral splinting; simple	22.0	90	5.0
50340 Recipient nephrectomy (separate procedure); unilateral	20.0	90	5.0	50405 complicated (congenital kidney abnormality, secondary pyeloplasty, solitary kidney calyccoplasty)	26.0	90	5.0
50341 bilateral	30.0	90	5.0	(50420 Nephropexy has been deleted)			
50360 Renal homotransplantation, implantation of graft; excluding donor and recipient nephrectomy	30.0	180	6.0				
50365 with unilateral recipient nephrectomy	50.0	180	6.0				
50366 with bilateral recipient nephrectomy	50.0	180	6.0				
50370 Removal of transplanted homograft (e.g., infarcted or rejected kidney)	13.0	60	6.0				
50380 Renal autotransplantation, reimplantation of kidney	30.0	120	6.0				
(For extra-corporeal "bench" surgery, use autotransplantation as the primary procedure and add the secondary procedure e.g., partial nephrectomy, nephrolithotomy, and use the modifier -51)							
INTRODUCTION							
(For injection procedure for retroperitoneal pneumography, see 49430)							
*50390 Aspiration and/or injection of renal cyst or pelvis by needle,							

19), § 296-22-245, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-245, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-245, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-245, filed 1/30/74; Order 68-7, § 296-22-245, filed 11/27/68, effective 1/1/69.]

	Unit Value	Follow-up Days=	Basic Anes@
SUTURE			
50500 Nephrorrhaphy, suture of kidney wound or injury	20.0	90	8.0
50520 Closure of nephrocuteaneous or pyelocutaneous fistula	20.0	90	5.0
50525 Closure of nephrovisceral fistula e.g., including visceral repair abdominal approach	24.0	90	5.0
50526 thoracic approach	24.0	90	11.0
(For supplemental skills of two surgeons, see WAC 296-22-010, item 5b, and modifier -62)			
50540 Symphysiotomy for horseshoe kidney with or without pyeloplasty and/or other plastic procedure, unilateral or bilateral (one operation)	28.0	90	5.0
ENDOSCOPY			
(For supplies and materials, use 99070)			
(References to office and hospital have been deleted)			
50551 Renal endoscopy through established nephrostomy or pyelostomy, with or without irrigation, instillation, or ureteropyelography, exclusive of radiologic service	2.0	3	3.0
50553 with ureteral catheterization ..	2.0	3	3.0
50555 with biopsy	2.0	3	3.0
50557 with fulguration, with or without biopsy	2.0	3	3.0
50559 with insertion of radioactive substance with or without biopsy and/or fulguration	3.0	3	3.0
50561 with removal of foreign body or calculus	2.0	3	3.0
When procedures 50570-50580 provide a significant identifiable service, they may be added to 50045 and 50120			
50570 Renal endoscopy through nephrotomy or pyelotomy, with or without irrigation, instillation, or ureteropyelography, exclusive of radiologic service;	1.4	3	
(For nephrotomy, see 50045)			
(For pyelotomy, see 50120)			
50572 with ureteral catheterization ..	1.8	3	
50574 with biopsy	1.8	3	
50576 with fulguration, with or without biopsy	2.0	3	
50578 with insertion of radioactive substance, with or without biopsy and/or fulguration	2.4	3	
50580 with removal of foreign body or calculus	2.0	3	
OTHER PROCEDURES			
50590 Lithotripsy, extracorporeal shock wave	BR		

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-245, filed 7/23/87; 86-06-032 (Order 86-

WAC 296-22-250 Ureter.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
50600 Ureterotomy with exploration or drainage (separate procedure) ..	18.0	90	5.0
(For ureteral endoscopy performed in conjunction with this procedure, see 50970-50980)			
50605 Ureterotomy for insertion of indwelling stent, all types	BR		5.0
50610 Ureterolithotomy; upper one-third or ureter	20.0	90	5.0
50620 middle one-third of ureter ...	18.0	90	5.0
50630 lower one-third	20.0	90	5.0
(For transvesical ureterolithotomy, see 51060)			
(For cystotomy with stone basket extraction of ureteral calculus, see 51065)			
(For endoscopic extraction or manipulation of ureteral calculus, see 50080, 50081, 50561, 52320-52330)			
EXCISION			
(For ureterocele, see 51535, 51536, 52300)			
50650 Ureterectomy, with bladder cuff (separate procedure)	20.0	90	5.0
50660 Ureterectomy, total, ectopic ureter, combination abdominal, vaginal and/or perineal approach ..	22.0	90	7.0
INTRODUCTION			
50684 Injection procedure for ureterography or ureteropyelography through ureterostomy or indwelling ureteral catheter (separate procedure)	0.3	0	
50686 Manometric studies through ureterostomy or indwelling ureteral catheter	0.4	0	
50688* Change of ureterostomy tube ...	0.3	0	
50690 Injection procedure for visualization of ilial conduit and/or ureteropyelography, exclusive of radiologic service (separate procedure)	0.4	0	
REPAIR			
(When substantial ureteral tapering is required for the following procedures, use modifier -22)			
50700 Ureteroplasty: Plastic operation on ureter (e.g., stricture)	20.0	90	5.0
50715 Ureterolysis, with or without repositioning of ureter for retroperitoneal fibrosis; unilateral	16.0	90	5.0
50716 bilateral	24.0	90	5.0

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
50722 Ureterolysis for ovarian vein syndrome	16.0	90	5.0	50920 Closure of ureterocutaneous fistula	20.0	90	5.0
50725 Ureterolysis for retrocaval ureter, with reanastomosis of upper urinary tract or vena cava	26.0	90	5.0	50930 Closure of ureterovisceral fistula (including visceral repair)			5.0
50740 Ureteropyelostomy anastomosis of ureter and renal pelvis	22.0	90	5.0	50940 Deligation of ureter	BR		5.0
50750 Ureterocalycostomy, anastomosis of ureter to renal calyx	24.0	90	5.0	(For ureteroplasty, ureterolysis, etc., see 50700-50861)			
50760 Ureteroureterostomy	22.0	90	5.0	ENDOSCOPY			
50770 Transureteroureterostomy anastomosis of ureter to contralateral ureter	24.0	90	5.0	50951 Ureteral endoscopy through established ureterostomy, with or without irrigation, instillation, or ureteropyelography, exclusive of radiologic service	2.5	3	
50780 Ureteroneocystostomy anastomosis of ureter to bladder, or other operations for correction of vesicoureteral reflux; unilateral	22.0	90	5.0	50953 with ureteral catheterization	2.5	3	
50781 bilateral	26.0	90	5.0	50955 with biopsy	2.5	3	
(When combined with cystourethroplasty or vasical neck revision, see 51820)				50957 with fulguration, with or without biopsy	2.5	3	
50785 Ureteroneocystostomy, with bladder flap; unilateral	24.0	90	5.0	50959 with insertion of radioactive substance with or without biopsy and/or fulguration (not including provision of material)	2.5	3	
50786 bilateral	28.0	90	5.0	50961 with removal of foreign body or calculus	2.5	3	
50800 Ureteroenterostomy, direct anastomosis of ureter to intestine; unilateral	22.0	90	5.0	When procedures 50970-50980 provide a significant identifiable service, they may be added to 50600			
50801 bilateral	26.0	90	5.0	50970 Ureteral endoscopy through ureterotomy, with or without irrigation, instillation, or ureteropyelography, exclusive of radiologic service;	1.3	3	
50810 Uretersigmoidostomy, with creation of sigmoid bladder and establishment of abdominal or perineal colostomy, including bowel anastomosis	30.0	120	6.0	(For ureterotomy, see 50600)			
(For supplemental skills of two surgeons, see WAC 296-22-010, item 5b, and modifier -62)				50972 with ureteral catheterization	1.8	3	
50820 Ureteroileal conduit (ileal bladder), including bowel anastomosis (Bricker operation); unilateral	30.0	120	6.0	50974 with biopsy	1.8	3	
(For supplemental skills of two surgeons, see WAC 296-22-010, item 5b, and modifier -62)				50976 with fulguration, with or without biopsy	2.0	3	
50821 bilateral	34.0	120	6.0	50978 with insertion of radioactive substance, with or without biopsy and/or fulguration (not including provision of material)	2.4	3	
(For combination of 50800-50821 with cystectomy, see 51580-51595)				50980 with removal of foreign body or calculus	2.0	3	
50830 Urinary undiversion (e.g., taking down of ureteroileal conduit, uretersigmoidostomy or ureterenterostomy with ureteroureterostomy or ureteroneocystostomy)	BR		6.0	[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-250, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-250, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-250, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-250, filed 1/30/74; Order 68-7, § 296-22-250, filed 11/27/68, effective 1/1/69.]			
50840 Replacement of all or part of ureter by bowel segment, including bowel anastomosis; unilateral	30.0	120	6.0	WAC 296-22-255 Bladder.			
(For supplemental skills of two surgeons, see WAC 296-22-010, item 5b, and modifier -62)					Unit Value	Follow-up Days=	Basic Anes@
50841 bilateral	40.0	120	6.0	INCISION			
50860 Ureterostomy, transplantation of ureter to skin; unilateral	18.0	90	5.0	51000 Aspiration of bladder by needle	0.4	0	
50861 bilateral	22.0	90	5.0	*51005 Aspiration of bladder; by trocar or intracatheter	*1.0	0	
SUTURE				51010 with insertion of suprapubic catheter	2.0	30	5.0
50900 Ureterorrhaphy, suture of ureter (separate procedure)	20.0	90	5.0	51020 Cystotomy or cystostomy; with fulguration and/or insertion of			

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
radioactive material	14.5	90	5.0	malignancy, with removal of bladder and ureteral transplants			
51030 with cryosurgical destruction of intravesical lesion	14.5	90	5.0	tions, with or without hysterectomy and/or abdominoperineal resection of rectum and colon and colostomy, or any combination thereof	BR		7.0
51040 Cystostomy, cystotomy with drainage	12.0	90	5.0				
51045 Cystotomy, with insertion of ureteral catheter or stent (separate procedure)	14.5	90	5.0	INTRODUCTION			
51050 Cystolithotomy, cystotomy with removal of calculus, without vesical neck resection	14.5	90	5.0	(For bladder catheterization, see 53670-53675)			
51060 Transvesical ureterolithotomy	19.0	90	5.0	51600 Injection procedure for cystography or voiding urethracystography	0.2	0	
51065 Cystotomy, with stone basket extraction and/or ultrasonic or electro-hydraulic fragmentation of ureteral calculus	12.0	30	5.0	51605 Injection procedure and placement of chain for contrast and/or chain urethrocytography	0.4	0	
51080 Drainage of perivesical or prevesical space abscess	8.0	90	5.0	51610 Injection procedure for retrograde urethrocytography	0.3	0	
EXCISION				(For injection procedure for retroperitoneal pneumography, see 49430)			
51500 Excision of urachal cyst or sinus, with or without umbilical hernia repair	14.0	90	5.0	*51700 Bladder irrigation, simple, lavage and/or instillation	*0.2	0	
51520 Cystotomy; for simple excision of vesical neck (separate procedure)	16.0	90	5.0	51705* Change of cystostomy tube; simple	0.3	0	
51525 for excision of bladder diverticulum, single or multiple (separate procedure)	20.0	90	5.0	51710* complicated	BR		
51530 for excision of bladder tumor	16.0	90	5.0	51720 Bladder instillation of anticarcinogenic agent (including detention time)	0.8	0	
(For transurethral excision, see 52200-52240)				URODYNAMICS			
51535 Cystotomy for excision, incision or repair of ureterocele; unilateral	16.0	90	5.0	The following section (51725-51796) lists procedures that may be used separately or in many and varied combinations. All of the presently known urodynamic procedures are listed as are some of their most frequently used combinations. When multiple procedures are performed in the same investigative session, modifier '-51' should be employed.			
51536 bilateral	18.0	90	5.0	All procedures in this section imply that these services are performed by, or are under the direct supervision of, a physician and that all instruments, equipment, fluids, gases, probes, catheters, technician's fees, medications, gloves, trays, tubing and other sterile supplies be provided by the physician. When the physician only interprets the results and/or operates the equipment, a p.c. (professional component modifier '-26') should be used to identify physicians' services.			
(For transurethral excision, see 52300)				Only the urodynamic testing is included in this section. The nerve blocks that are listed may be pudendal, unilateral or bilateral; sacral, unilateral or bilateral, single or multiple; or subarachnoid and epidural of the sacral segments. They are listed in the neurosurgical section 62274-62279 and 64430-64441.			
51550 Cystectomy, partial; simple	18.0	90	6.0	CYSTOMETROGRAM STUDIES (CMG)			
51555 complicated (e.g., postradiation, previous surgery, difficult location)	20.0	90	6.0	As a single procedure (separate procedure) performed in any body position, including residual urine volume, volume at first urge to void, bladder capacity, tracing (if available), interpretation and report. (For simultaneous electromyogram see 51786 and 51788)			
51565 Cystectomy, partial, with reimplantation of ureter(s) into bladder (ureter-aneocystostomy)	24.0	90	6.0				
51570 Cystectomy, complete; (separate procedure)	26.0	90	6.0				
51575 with bilateral pelvic lymphadenectomy, including external iliac, hypogastric and obturator nodes	34.0	90	6.0				
51580 Cystectomy, complete with ureterosigmoidotomy or ureterocutaneous transplantations;	34.0	120	7.0				
51585 with bilateral pelvic lymphadenectomy, including external iliac, hypogastric and obturator nodes	40.0	120	7.0				
51590 Cystectomy, complete, with ureteroileal conduit or sigmoid bladder, including bowel anastomosis;	44.0	120	7.0				
51595 with bilateral lymphadenectomy, including external iliac, hypogastric and obturator nodes	50.0	120	7.0	51725 Simple cystometrogram (CMG) (e.g., spinal manometer)	BR		
51597 Pelvic exenteration, complete, for vesical, prostatic or urethral				51726 Complex cystometrogram (e.g., calibrated electronic equipment)			
				(51727-51733 have been deleted. To report, use 51726)			

Unit Follow-
Value up Basic
Days= Anes@

UROFLOWMETRIC STUDIES (UFR)

As a single procedure (separate procedure) performed in any body position, including volume, flow rate, and tracing (if available), interpretation and report. (For simultaneous electromyogram see 51787, 51788.) (For simultaneous voiding pressure see 51795-51796)

EXTERNAL MEASUREMENTS

- 51736 Simple uroflowmetry (UFR) (e.g., stop-watch flow rate, mechanical uroflowmeter); BR
(51737-51738 have been deleted. To report, use 51736)
- 51739 Sound recording of external stream (e.g., Lyons type, Keitzer type) BR
- 51741 Complex uroflowmetry (e.g., calibrated electronic equipment) ... 8
(51742-51749 have been deleted. To report, use 51741)

INTERNAL STREAM MEASUREMENTS

(51751-51769 have been deleted. To report, use 53899)

URETHRAL PRESSURE PROFILE STUDIES - URETHRAL CLOSURE PRESSURE PROFILE (UPP)

As a single procedure (separate procedure) performed in any body position, including up to three recordings of urethral length and pressure, tracing (if available), interpretation and report. Any initial volume.

- 51772 Urethral pressure profile, studies (UPP) (urethral closure pressure profile), any technique gas or liquid; initial recording BR
(51773-51783 have been deleted. To report, use 51772)

ELECTROMYOGRAPHIC STUDIES (EMG)

Anal or urethral sphincter, detrusor, urethra, perineum or abdominal musculature. (Usually not a separate procedure.)

- 51785 Electromyographic studies (EMG) of anal or urethral sphincter, any technique BR
(51786-51791 have been deleted. To report, use 51785)
- 51792 Stimulus evoked response (e.g., measurement of bulbocavernosus reflex latency time) BR
- 51795 Voiding pressure studies (VP); bladder voiding pressure, any technique BR
(51796 has been deleted. To report, use 51795)
- 51797 intra-abdominal voiding pressure (AP) (rectal, gastric, intraperitoneal)

REPAIR

- 51800 Cystoplasty or cystourethroplasty, plastic operation on bladder and/or vesical neck (anterior Y-plasty, vesical fundus resection), any procedure, with or without wedge resection of posterior vesical neck 20.0 90 5.0

- 51820 Cystourethroplasty with unilateral or bilateral ureteroneocystostomy 30.0 90 5.0
- 51840 Anterior vesicourethropexy, or urethropexy (Marshall-Marchetti-Krantz type); simple 14.5 90 4.0
- 51841 complicated (e.g., secondary repair) 21.0 90 4.0

(For urethropexy (Peyreya type), see 57289)

- 51845 Abdomino-vaginal vesical neck suspension, with or without endoscopic control (e.g., Stamey, Raz, modified Peyreya) BR 4.0
- 51860 Cystorrhaphy, suture of bladder wound, injury or rupture; simple 14.5 90 4.0
- 51865 complicated BR+ 6.0
- 51880 Closure of cystostomy (separate procedure) 8.0 90 3.0
- 51900 Closure of vesicovaginal fistula, abdominal approach 22.0 90 5.0
(For vaginal approach, see 57320-57330)

- 51920 Closure of vesicouterine fistula; .. 20.0 90 5.0
- 51925 with hysterectomy 20.0 90 5.0

(For closure of vesicoenteric fistula, see 44660, 44661)

(For closure of rectovesical fistula, see 45800-45805)

- 51940 Closure of exstrophy (see also 54390) BR 5.0
- 51960 Enterocystoplasty, including bowel anastomosis 30.0 90 5.0
- 51980 Cutaneous vesicostomy 18.0 90 5.0

ENDOSCOPY - CYSTOSCOPY, URETHROSCOPY, CYSTOUR-ETHROSCOPY

NOTES

Endoscopic descriptions are listed so that the main procedure can be identified without having to list all the minor related functions performed at the same time. For example: Meatotomy, urethral calibration and/or dilation, urethroscopy, and cystoscopy prior to a transurethral resection of prostate; ureteral catheterization following extraction of ureteral calculus; internal urethrotomy and bladder neck fulguration when performing a cystourethroscopy for the female urethral syndrome. When the secondary procedure requires significant additional time and effort, it may be identified by the addition of modifier '-22.' For example: Urethrotomy performed for a documented preexisting stricture or bladder neck contracture.

- 52000 Cystourethroscopy (separate procedure) 1.2 7 3.0
- 52005 with ureteral catheterization, with or without irrigation, instillation, or ureterpyelography, exclusive of radiologic service 1.6 7 3.0
- 52007 with brush biopsy of ureter and/or renal pelvis BR 3 3.0
- 52010 with ejaculatory duct catheterization 1.6 7

TRANSURETHRAL SURGERY (URETHRA AND BLADDER)

- 52204 Cystourethroscopy, with biopsy . 2.0 7 3.0
- 52214 Cystourethroscopy, with fulguration (including cryosurgery or laser surgery) of trigone, bladder neck, prostatic fossa, urethra, or periurethral glands 2.0 7 3.0

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
52224				TRANSURETHRAL SURGERY (URETER AND PELVIS)			
				52320			
52224	2.0	7	3.0	52320	7.0	30	3.0
52234				52325	BR	30	3.0
	5.0	30	3.0	52330	5.0	30	3.0
52235	12.0	30	3.0	52332			
52240	18.0	30	5.0	52332			
52250	6.0	30	3.0	52334	BR	7	3.0
52260	3.0	30	3.0				
	1.4	7					
52265	4.0	45	3.0	52335			
52270	4.0	45	3.0	52335	4.2	7	3.0
52275	4.0	45	3.0	52336	BR		3.0
52276	4.0	45	3.0	52337	BR		3.0
52277	6.0	30	3.0	52338	BR		3.0
52281	2.4	7	3.0				
	2.0	7	3.0	TRANSURETHRAL SURGERY (VESICAL NECK AND PROSTATE)			
52283				52340	6.0	30	3.0
52285	3.4	7	3.0	52500	10.0	90	4.0
	4.0	30	3.0	52601	20.0	90	5.0
52290	4.0	30	3.0				
52300	6.0	30	3.0				
52305	6.0	30	3.0	52606	2.4	0	
52310	4.0	30	3.0	52612	15.0	90	5.0
	BR+			52614	11.0	90	5.0
52315				52620	6.0	90	5.0
52317	BR	30	3.0	52630	20.0	90	5.0
	BR	30	3.0	52640	10.0	90	5.0
52318							

Surgical Fees

296-22-260

	Unit Value	Follow-up Days=	Basic Anes@
52650 Transurethral cryosurgical removal of prostrate (postoperative irrigations and aspirations of sloughing tissue included)	20.0	120	5.0
52700 Transurethral drainage of prostatic abscess	8.0	60	5.0
(52800, 52805 Litholapaxy [litholapaxy] have been deleted. To report, use 52317, 52318)			

	Unit Value	Follow-up Days=	Basic Anes@
53260 Excision or fulguration; urethral polyp(s), distal urethra	1.0	15	3.0
(For endoscopic approach, see 52212-52224)			
53265 urethral caruncle	1.2	15	3.0
53270 Skene's glands	1.2	15	3.0
53275 urethral prolapse	3.0	30	3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-255, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-255, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-255, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-255, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-255, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-255, filed 1/30/74; Order 68-7, § 296-22-255, filed 11/27/68, effective 1/1/69.]

WAC 296-22-260 Urethra.

(For endoscopy, see cystoscopy, urethroscopy, cystourethroscopy, 52000-52805)

(For injection procedure for urethrocytography, see 51600-51610)

INCISION

	Unit Value	Follow-up Days=	Basic Anes@
53000 Urethrotomy or urethrostomy, external (separate procedure); pendulous urethra	2.4	15	3.0
53010 perineal urethra, external	6.0	30	3.0
53020 Meatotomy, cutting of meatus (separate procedure), except infant	1.0	15	3.0
(53021 has been deleted. To report use 53020)			
53025 Infant	0.6	15	3.0
53040 Drainage of deep periurethral abscess	3.0	30	3.0
(For subcutaneous abscess, see 10060-10061)			
53060 Drainage of Skene's gland abscess or cyst	1.2	15	3.0
53080 Drainage of perineal urinary extravasation; uncomplicated (separate procedure)	4.0	15	3.0
53085 complicated	BR+		5.0

EXCISION

	Unit Value	Follow-up Days=	Basic Anes@
53200 Biopsy of urethra	2.0	7	3.0
53210 Urethrectomy, total, including cystostomy; female	14.0	60	5.0
53215 male	18.0	60	5.0
53220 Excision or fulguration of carcinoma of urethra	BR+		3.0
53230 Excision of urethral diverticulum (separate procedure); female	10.0	60	3.0
53235 male	12.0	60	3.0
53240 Marsupialization of urethral diverticulum, male or female	4.0	30	3.0
53250 Excision of bulbourethral gland (Cowper's gland)	12.0	60	3.0

REPAIR

(For hypospadias, see 54300-54352)

	Unit Value	Follow-up Days=	Basic Anes@
53400 Urethroplasty; first stage, for fistula, diverticulum, or stricture, (e.g., Johanssen type)	10.0	60	3.0
53405 second stage (formation of urethra), including urinary diversion	14.0	60	3.0
53410 Urethroplasty, one-stage reconstruction of male anterior urethra	16.0	60	3.0
53415 Urethroplasty, transpubic, one stage, for reconstruction or repair of prostatic or membranous urethra	BR		3.0
53420 Urethroplasty, two-stage reconstruction or repair of prostatic or membranous urethra; first stage	20.0	60	3.0
53425 second stage	20.0	90	3.0
53430 Urethroplasty, reconstruction of female urethra	14.0	90	3.0
53440 Operation for correction of male urinary incontinence, with or without introduction of prosthesis	20.0	90	3.0
53442 Removal of perineal prosthesis introduced for continence	BR	90	3.0
53443 Urethroplasty with tubularization of posterior urethra and/or lower bladder for incontinence (e.g., Tenago, Leadbetter procedure)	BR		3.0
53445 Operation for correction of urinary incontinence with placement of inflatable urethral or bladder neck sphincter, including placement of pump and/or reservoir	BR	90	3.0
53447 Removal, repair or replacement of inflatable sphincter including pump and/or reservoir and/or cuff	BR	90	3.0
53449 Surgical correction of hydraulic abnormality of inflatable sphincter device	BR	90	3.0
53450 Urethromeatoplasty, with mucosal advancement	4.0	30	3.0
53460 Urethromeatoplasty, with partial excision of distal urethral segment (Richardson type procedure)	3.4	30	3.0

SUTURE

	Unit Value	Follow-up Days=	Basic Anes@
53502 Urethrorrhaphy, suture of urethral wound or injury, female	BR		3.0
53505 Urethrorrhaphy, suture of urethral wound or injury; penile	10.0	90	3.0
53510 perineal	14.0	90	3.0
53515 prostatic/membranous	20.0	90	3.0

	Unit Value	Follow-up Days=	Basic Anes@
53520 Closure of urethrostomy or urethrocutaneous fistula, male (separate procedure)	6.0	90	3.0
(For closure of urethrovaginal fistula, see 57310)			
(For closure of urethrorectal fistula, see 45820, 45825)			

MANIPULATION

*53600 Dilation of urethral stricture by passage of sound or urethral dilator, male; initial	*0.4	0	
*53601 subsequent	*0.3	0	
53605 Dilation of urethral stricture or vesical neck by passage of sound or urethral dilator, male, general or conduction (spinal) anesthesia	1.6	3	3.0
*53620 Dilation of urethral stricture by passage of filiform and follower, male; initial	*0.8	0	
*53621 subsequent	*0.6	0	
*53640 Passage of filiform and follower for acute vesical retention, male	*0.8	0	
*53660 Dilation of female urethra including suppository and/or instillation; initial	*0.4	0	
*53661 subsequent	*0.3	0	
53665 dilation of female urethra, general or conduction (spinal) anesthesia	1.5	3	3.0
53670* Catheterization; simple	0.3	0	
53675* complicated (may include difficult removal of balloon catheter)	0.7	0	
53899 Unlisted procedure, urinary system	BR		3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-260, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-260, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-260, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-260, filed 1/30/74; Order 68-7, § 296-22-260, filed 11/27/68, effective 1/1/69.]

MALE GENITAL SYSTEM

WAC 296-22-265 Penis.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
54000 Slitting of prepuce, dorsal or lateral, (separate procedure); newborn	0.6	7	
54001 except newborn	1.4	7	3.0
54015 Incision and drainage of penis, deep	1.4	15	3.0
DESTRUCTION			
*54050 Destruction of lesion(s), penis, (e.g., condyloma, papilloma, molluscum, contagiosum, herpetic vesicle), simple, chemical	*0.3	0	3.0
*54055 electrodesiccation	*0.8	0	3.0
54056 cryosurgery	BR		3.0
54057 laser surgery	BR		3.0
54060 surgical excision	*1.0	0	3.0
54065 extensive, any method	BR		3.0

(For destruction or excision of other lesions, see integumentary system)

EXCISION

54100 Biopsy of penis, cutaneous (separate procedure)	0.6	7	3.0
54105 deep structures	1.4	15	3.0
54110 Excision of penile plaque (Peyronie disease);	7.4	30	3.0
54111 with graft to 5 cm in length	BR		3.0
54112 with graft greater than 5 cm in length	BR		3.0
54115 Removal foreign body from deep penile tissue (e.g., plastic implant)	6.0	45	3.0
54120 Amputation of penis, partial	10.0	60	3.0
54125 complete	20.0	60	3.0
54130 Amputation of penis, radical; with bilateral inguofemoral lymphadenectomy	26.0	90	3.0
54135 in continuity with bilateral pelvic lymphadenectomy, including external iliac, hypogastric and obturator nodes	30.0	90	5.0
(For lymphadenectomy (separate procedure), see 38760-38771)			
54150 Circumcision, clamp procedure; newborn	0.8	15	
54152 except newborn	1.0	15	3.0
(54154 has been deleted. To report, use 54152)			
54160 Circumcision, surgical excision other than clamp or dorsal slit; newborn	0.8	30	
54161 except newborn	3.0	30	3.0

INTRODUCTION

*54200 Injection procedure for Peyronie disease	*0.4	0	
54205 with surgical exposure of plaque	7.4	30	3.0
54220 Irrigation of corpora cavernosa for priapism	BR		3.0
54230 injection procedure for corpora cavernosography	BR		3.0
54240 penile plethysmography	BR		3.0
54250 Nocturnal penile tumescence test	BR		3.0

REPAIR

(For other urethroplasties, see 53400-53430)			
54300 Plastic operation of penis for straightening of chordee (e.g., hypospadias), with or without mobilization of urethra;	8.0	60	3.0
(54305 has been deleted. To report, see 54304 et seq.)			
54304 Plastic operation on penis for correction of chordee or for first stage hypospadias repair with or without transplantation of prepuce and/or skin flaps	BR		3.0
54308 Urethroplasty for second stage hypospadias repair (including			

	Unit Value	Follow-up Days=	Basic Anes@
urinary diversion); less than 3 cm.....	BR		3.0
54312 greater than 3 cm	BR		3.0
54316 Urethroplasty for second stage hypospadias repair (including urinary diversion) with free skin graft obtained from site other than genitalia.....	BR		3.0
54318 Urethroplasty for third stage hypospadias repair to release penis from scrotum (e.g., third stage Cecil repair).....	BR		3.0
(54320, 54325, 54330 have been deleted. To report, see 54308 et seq.)			
54322 One stage distal hypospadias repair (with or without chordee or circumcision); with simple meatal advancement (e.g., Magpi, V-flap)	BR		3.0
54324 with urethroplasty by local skin flaps (e.g., flip-flap, prepuccial flap)	BR		3.0
54326 with urethroplasty by local skin flaps and mobilization of urethra	BR		3.0
54328 with extensive dissection to correct chordee and urethroplasty with local skin flaps, skin graft patch, and/or island flap	BR		3.0
54332 One stage proximal penile or penoscrotal hypospadias repair requiring extensive dissection to correct chordee and urethroplasty by use of skin graft tube and/or island flap	BR		3.0
54336 One stage perineal hypospadias repair requiring extensive dissection to correct chordee and urethroplasty by use of skin graft tube and/or island flap	BR		3.0
54340 Repair of hypospadias complications (i.e., fistula, stricture, diverticula); by closure, incision, or excision, simple	BR		3.0
54344 requiring mobilization of skin flaps and urethroplasty with flap or patch graft....	BR		3.0
54348 requiring extensive dissection and urethroplasty with flap, patch or tubed graft (includes urinary diversion)	BR		3.0
54352 Repair of hypospadias cripple requiring extensive dissection and excision of previously constructed structures including re-release of chordee and reconstruction of urethra and penis by use of local skin as grafts and island flaps and skin brought in as flaps or grafts	BR		3.0
54360 Plastic operation on penis to correct angulation	BR	90	3.0
54380 Plastic operation on penis for epispadias distal to external sphincter	BR+		3.0
54385 with incontinence	BR		4.0
54390 with exstrophy of bladder	BR		4.0

	Unit Value	Follow-up Days=	Basic Anes@
54400 Insertion of penile prosthesis, noninflatable	14.0		3.0
54402 Removal or replacement of noninflatable penile prosthesis ..	BR		
54405 Insertion of inflatable penile prosthesis, including placement of pump, cylinders and/or reservoir	BR		3.0
54407 Removal repair or replacement of inflatable penile prosthesis, including pump and/or reservoir and/or cylinders	BR		3.0
55409 Surgical correction of hydraulic abnormality of inflatable prosthesis	BR		3.0
54420 Corpora cavernosa-saphenous vein shunt (priapism operation), unilateral or bilateral	10.0		3.0
54430 Corpora cavernosa-corpora spongiosum shunt or corpora cavernosa-glans penis shunt (priapism operation), unilateral or bilateral	10.0	0	3.0
54435 Corpora cavernosa-glans penis fistulization (e.g., biopsy needle, Winter procedure, rongeur, or punch) for priapism	BR		3.0
54440 Plastic operation of penis for injury	BR		3.0

MANIPULATION

54450 Foreskin manipulation including lysis of preputial adhesions and stretching	BR		3.0
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[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-265, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-265, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-265, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-265, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-265, filed 1/30/74; Order 68-7, § 296-22-265, filed 11/27/68, effective 1/1/69.]

FEMALE GENITAL SYSTEM

(For pelvic laparotomy, see 49000)

(For endometriomas resection, see 49200, 49201)

(For paracentesis, see 49080, 49081)

(For injection procedure for pelvic pneumography, see 49440)

(For secondary closure of abdominal wall evisceration or disruption, see 49900)

(For chemotherapy, see 90790-90793)

WAC 296-22-310 Vulva and introitus.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
(For incision and drainage of sebaceous cyst, furuncle, or caruncle, see 10000-10020, 10060, 10061)			
*56400 Incision and drainage, abscess of vulva, extensive	*0.8	0	3.0
*56420 Incision and drainage of Bartholin's gland abscess, unilateral	*1.0	0	3.0
(For incision and drainage of Skene's gland abscess or cyst, see 53060)			
56440 Marsupialization of Bartholin's gland cyst	4.0	30	3.0
DESTRUCTION			
*56501 Destruction of lesion(s), vulva; simple, any method	BR	0	3.0
(56500 has been deleted, use 56501)			
56515 extensive, any method	BR+		3.0
(56520-56521 have been deleted, use 56501 or 56515)			
(For destruction of Skene's gland cyst or abscess, see 53270)			
(For cautery destruction of urethral caruncle, see 53265)			
EXCISION			
56600 Biopsy of vulva (separate procedure)	0.6	7	3.0
(For local excision or fulguration of lesion(s) of external genitalia, see 11420-11426, 11620-11626, 17000-17302, 56500-56521)			
56620 Vulvectomy; partial, unilateral or bilateral (but less than 80% of vulvar area)	12.0	60	3.0
56625 complete (skin and subcutaneous tissue), bilateral	15.0	60	3.0
(For skin graft, see 15000 et seq)			
56630 Vulvectomy, radical; without skin graft	20.0	120	3.0
56635 with inguofemoral lymphadenectomy, unilateral	24.0	120	5.0
56636 with inguofemoral lymphadenectomy, bilateral	26.0	120	5.0
56640 vulvectomy, radical, with inguofemoral, iliac, and pelvic lymphadenectomy; unilateral	26.0	120	5.0
56641 bilateral	30.0	120	5.0
(For lymphadenectomy, see 38760-38780)			
56680 Clitoridectomy, simple	8.0	30	3.0
56685 extensive	12.0	90	3.0
56700 Hymenectomy, partial excision of hymen	2.4	30	3.0
56710 Plastic revision of hymen	2.4	30	3.0

	Unit Value	Follow-up Days=	Basic Anes@
*56720 Hymenotomy, simple incision	*1.4	0	3.0
56740 Excision of Bartholin's gland or cyst	4.8	30	3.0
(For excision of Skene's gland, see 53270)			
(For excision of urethral caruncle, see 53265)			
(For excision or fulguration of urethral carcinoma, see 53220)			
(For excision or marsupialization of urethral diverticulum, see 53230-53240)			
REPAIR			
(For repair of urethra for mucosal prolapse, see 53275)			
56800 Plastic repair of introitus	4.8	30	3.0
SUTURE			
(For episiorrhaphy, episioepineorrhaphy for recent injury of vulva and/or perineum, nonobstetrical, see 57210)			
[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-310, filed 7/23/87; 83-16-066 (Order 83-23), § 296-22-310, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-310, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-310, filed 1/30/74; Order 68-7, § 296-22-310, filed 11/27/68, effective 1/1/69.]			

WAC 296-22-315 Vagina.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
57000 Colpotomy with exploration	4.0	30	3.0
57010 with drainage of pelvic abscess	BR		
*57020 Colpocentesis (separate procedure)	*0.8	0	3.0
DESTRUCTION			
(57050, 57057, 57060 and 57063 have been deleted, use 57061 or 57065)			
57061 Destruction of vaginal lesion(s); simple, any method	0.7		3.0
57065 extensive, any method	BR		3.0
EXCISION			
*57100 Biopsy of vaginal mucosa; simple (separate procedure)	0.72	7	3.0
57105 extensive, requiring suture (including cysts)	BR		3.0
57108 Colpectomy, obliteration of vagina; partial	12.0	60	3.0
(For excision and/or fulguration of local lesion(s), see 11200-11660, 17000-17300)			
57110 complete	14.0	60	3.0
57120 Colpocleisis (Le Fort type)	12.0	60	3.0
57130 Excision of vaginal septum	BR		3.0

Surgical Fees

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	Unit Value	Follow-up Days=	Basic Anes@
57135 Excision of vaginal cyst or tumor	BR		3.0
INTRODUCTION			
*57150 Irrigation and/or application of medicament for treatment of bacterial, parasitic or fungoid disease	*0.24	0	
*57160 Insertion of pessary	*0.24	0	
57170 Diaphragm fitting with instructions	0.24		
57180 Introduction of any hemostatic agent or pack for spontaneous or traumatic nonobstetrical hemorrhage (separate procedure)	BR		3.0
REPAIR			
(For urethral suspension, (Marshall-Marchetti-Krantz type) abdominal approach, see 51840, 51841)			
57200 Colporrhaphy, suture of injury of vagina (nonobstetrical)	BR	3.0	
57210 Colpoperineorrhaphy, suture of injury of vagina and/or perineum (nonobstetrical)	BR	3.0	
57220 Plastic operation on urethral sphincter, vaginal approach (eg, Kelly urethral plication) (separate procedure)	7.0	60	3.0
57230 Plastic repair of urethrocele (separate procedure)	7.0	60	3.0
57240 Anterior colporrhaphy, repair of cystocele with or without repair of urethrocele (separate procedure)	8.5	60	4.0
57250 Posterior colporrhaphy, repair of rectocele with or without perineorrhaphy	7.0	60	3.0
(For repair of rectocele (separate procedure) without posterior colporrhaphy, see 45560)			
57260 Combined anteroposterior colporrhaphy;	12.0	60	3.0
57265 with enterocele repair	14.0	60	3.0
57268 Repair of enterocele, vaginal approach (separate procedure)	BR		
57270 Repair of enterocele, abdominal approach (separate procedure) ..	14.0	60	4.0
57280 Colpopexy, abdominal approach ..	14.0	60	4.0
57282 Sacrospinous ligament fixation for prolapse of vagina following hysterectomy (separate procedure)	BR		3.0
57288 Sling operation for stress incontinence (e.g., fascia or synthetic) ..	15.0	90	5.0
57289 Pereyra procedure, including anterior colporrhaphy	13.0	90	3.0
(57290 has been deleted. To report, use 57291, 57292)			
57291 Construction of artificial vagina; without graft	BR		3.0
57292 with graft	BR		3.0
57300 Closure of rectovaginal fistula; vaginal approach	14.5	90	3.0
57305 abdominal approach	18.0	90	5.0
57307 abdominal approach, with concomitant colostomy	20.0	90	5.0
57310 Closure of urethrovaginal fistula	14.5	60	4.0

	Unit Value	Follow-up Days=	Basic Anes@
57311 with bulbo cavernous transplant	BR	60	4.0
57320 Closure of vesicovaginal fistula, vaginal approach	14.5	60	4.0
(For concomitant cystostomy, see 51005-51040 and WAC 296-22-010, item 7a)			
57330 transvesical and vaginal approach	BR		5.0
(For abdominal approach, see 51900)			
MANIPULATION			
*57400 Dilatation of vagina under anesthesia	*0.72	0	3.0
*57410 Pelvic examination under anesthesia	*0.72	0	3.0
ENDOSCOPY			
57450 Culdoscopy, diagnostic;	4.0	15	3.0
57451 with biopsy and/or lysis of adhesions or tubal sterilization ..	4.0	15	3.0
57452* Colposcopy; (separate procedure)	1.0	0	
57454* with biopsies, or biopsy of the cervix	2.0	0	
[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-315, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-315, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-315, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-315, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-315, filed 1/30/74; Order 68-7, § 296-22-315, filed 11/27/68, effective 1/1/69.]			
WAC 296-22-330 Corpus uteri.			
	Unit Value	Follow-up Days=	Basic Anes@
EXCISION			
*58100 Endometrial biopsy, suction type (separate procedure)	*0.72	0	3.0
58101* Endometrial washings (e.g., for cytology sampling)	1.0	0	3.0
58102 Office endometrial curettage ..	2.0	0	3.0
58103 Menstrual extraction	0.5	0	
58120 Dilatation and curettage, diagnostic and/or therapeutic (obstetrical) (see also 57520 nonobstetrical)	4.0	15	3.0
(For postpartum hemorrhage, see 59160)			
58140 Myomectomy, excision of fibroid tumor of uterus, single or multiple, (procedure); abdominal approach	14.0	45	5.0
58145 vaginal approach	BR		5.0
58150 Total hysterectomy (corpus and cervix), with or without removal of tube(s), with or without removal of ovary(s)	16.0	45	5.0
58152 with colpo-urethrocystopexy (Marshall-Marchetti-Krantz type)	BR		5.0
(For urethrocystopexy without hysterectomy, see 51840, 51841)			

	Unit Value	Follow-up Days=	Basic Anes@
58180 Supracervical hysterectomy (subtotal hysterectomy), with or without tube(s), with or without removal of ovary(s)	16.0	45	5.0
58200 Total hysterectomy, extended, corpus cancer, including partial vaginectomy;	20.0	120	5.0
58205 with bilateral radical pelvic lymphadenectomy	24.0	120	6.0
58210 Total hysterectomy, extended, cervical cancer, with bilateral radical pelvic lymphadenectomy (Wertheim type operation)	30.0	120	7.0
58240 Pelvic exenteration for gynecological malignancy, with total hysterectomy or cervicectomy, with removal of bladder and ureteral transplantations, and/or abdominoperineal resection of rectum and colon and colostomy, or any combination thereof (pelvic exenteration)	BR		7.0

(For pelvic exenteration of lower urinary tract or male genital malignancy, use 51597)

58260 Vaginal hysterectomy;	16.0	45	4.0
58265 with plastic repair of vagina, anterior and/or posterior colporrhaphy	18.0	45	4.0
58267 with colpo-urethrocystopexy (Marshal-Marchetti-Krantz type, Pereyra type, with or without endoscopic control)	20.0	90	5.0
58270 with repair of enterocele	18.0	45	4.0
58275 Vaginal hysterectomy, with total or partial colpocystomy;	18.0	45	4.0
58280 with repair of enterocele	18.0	45	4.0
58285 Vaginal hysterectomy, radical (Schauta type operation)	24.0	120	7.0

INTRODUCTION

(For insertion of radioactive substance into corpus with or without dilation and curettage, see 77520-77550)

*58300 Insertion of intrauterine device (IUD)	*1.0	0	3.0
58301 Removal of intrauterine device (IUD)	BR		
58310 Artificial insemination	BR		
58311 with sperm washing	BR		
*58320 Insufflation of uterus and tubes with air and CO ₂	*1.0	0	3.0
*58340 Injection procedure for hysterosalpingography	0.8	0	
58350 Hydrotubation of oviduct, including materials	1.0	0	

(For materials supplied by physician, see 99070)

REPAIR

58400 Uterine suspension, with or without shortening of round ligaments, with or without shortening of sacrouterine ligaments; (separate procedure)	12.0	45	4.0
58410 with presacral sympathectomy	14.0	45	5.0

(Interposition operation has been deleted. If necessary to report, use 58999)

(58500 Hysterosalpingostomy has been deleted. To report, use 58752)

58520 Hysterorrhaphy, repair of ruptured uterus (nonobstetrical)	12.0	45	4.0
58540 Hysteroplasty, repair of uterine anomaly (Strassman type)	14.0	45	4.0

SUTURE

(For closure of vesicouterine fistula, see 51920)

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-330, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-330, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-330, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-330, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-330, filed 1/30/74; Order 68-7, § 296-22-330, filed 11/27/68, effective 1/1/69.]

WAC 296-22-337 Ovary.

	Unit Value	Follow-up Days=	Basic Anes@
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OVARY

INCISION

58800 Drainage of ovarian cyst(s), unilateral, or bilateral, (separate procedure); vaginal approach	4.0	15	4.0
58805 abdominal approach	12.0	45	4.0
58820 Drainage of ovarian abscess; vaginal approach	4.0	15	4.0
58822 abdominal approach	6.0	15	4.0

EXCISION

58900 Biopsy of ovary, unilateral or bilateral (separate procedure)	12.0	45	4.0
58920 Wedge resection or bisection of ovary, unilateral or bilateral	12.0	45	4.0
58925 Ovarian cystectomy, unilateral or bilateral	12.0	45	4.0
58940 Oophorectomy, partial or total, unilateral or bilateral;	12.0	45	4.0
58942 with concomitant debulking procedure, ovarian malignancy	BR	45	4.0
58945 with total omentectomy	16.0	60	4.0

ENDOSCOPY-LAPAROSCOPY

The endoscopic descriptors in this publication are listed so that the main procedure can easily be identified without having to list all the minor related procedures that may be performed at the same time (such as lysis of adhesions and fulguration of bleeding points during laparoscopy with fulguration transection of the oviducts). When the secondary procedures involve significant additional time and effort, they may be listed using modifier -50.

(For peritoneoscopy, see 49300-49303)

58980 Laparoscopy for visualization of pelvic viscera;	6.0	10	5.0
58982 with fulguration of oviducts (with or without transection)	8.0	10	5.0
58983 with occlusion of oviducts			

Surgical Fees

296-22-340

	Unit Value	Follow-up Days=	Basic Anes@
by device (e.g., band, clip, or Falope ring).....	BR		5.0
(For vaginal or suprapubic approach), see 58615)			
58984 with fulguration of ovarian or peritoneal lesions by any method	8.0	10	5.0
58985 with lysis of adhesions	8.0	10	5.0
58986 with biopsy (single or multiple)	8.0	10	5.0
58987 with aspiration (single or multiple)	8.0	10	5.0
58990 Hysteroscopy, diagnostic	BR		3.0
58995 therapeutic	BR		3.0

OTHER PROCEDURES

58999 Unlisted procedure, female genital system nonobstetrical	BR		3.0
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[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-337, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-337, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-337, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-337, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-337, filed 1/30/74. Formerly WAC 296-22-320.]

MATERNITY CARE AND DELIVERY

WAC 296-22-340 Maternity care and delivery.

NOTES

The services normally required in uncomplicated maternity cases include antepartum care, delivery and postpartum care.

Antepartum care includes usual prenatal services (initial and subsequent history, physical examinations, recording of weight, blood pressure, fetal heart tones, routine chemical urinalyses, maternity counseling).

Delivery includes vaginal delivery (with or without episiotomy, with or without forceps or breech delivery) or Cesarean section, and resuscitation of new born infant when necessary.

Postpartum care includes hospital and office visits following vaginal or Cesarean section delivery.

For medical complications of pregnancy (toxemia, cardiac problems, neurological problems or other problems requiring additional or unusual services or requiring hospitalization), see services in MEDICINE section. For surgical complications of pregnancy not listed below, see appropriate procedures in SURGERY.

If a physician provides all or part of the antepartum and/or postpartum patient care but does not perform the delivery due to termination of pregnancy by abortion or referral to another physician for delivery, see 59420-59430.

(For circumcision of newborn, see 54150-54160)

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
59000 Amniocentesis for diagnostic purposes, abdominal approach ..	1.0	0	
(For ultrasonic guidance, see 76946, 76947)			
59010* Amnioscopy	1.0	0	
59011* Amnioscopy (intraovular)	BR	0	

59015 Chorionic villus sampling	BR	0	
59020* Fetal oxytocin stress test	1.0	0	
59025 Fetal nonstress test	1.0		
59030* Fetal scalp blood sampling;	1.0	0	
59031* repeat	0.5	0	
59050 Initiation and/or supervision of internal fetal monitoring during labor by consultant	1.0	0	

EXCISION

59100 Hysterotomy, abdominal, for removal of hydatidiform mole;	14.0	45	5.0
59101 with tubal ligation	14.0	45	6.0
59105 Hysterotomy, abdominal, for legal abortion;	16.0	45	6.0
59106 with tubal ligation	18.0	45	6.0

EXCISION

59120 Surgical treatment of ectopic pregnancy; tubal, requiring sanpinglectomy and/or oophorectomy, abdominal or vaginal approach	14.0	45	5.0
59121 tubal, without sanpinglectomy and/or oophorectomy	BR		5.0
59125 ovarian, requiring oophorectomy and/or sanpinglectomy ..	BR		5.0
59126 ovarian, without oophorectomy and/or sanpinglectomy	BR		5.0
59130 abdominal	BR		5.0
59135 interstitial, uterine pregnancy requiring hysterectomy, total or subtotal	BR		5.0
59140 cervical	BR		5.0
59160 Dilatation and curettage for postpartum hemorrhage (separate procedure)	4.0	15	3.0

INTRODUCTION

(For intrauterine fetal transfusion, see 36460)

(For introduction of hypertonic solution and/or prostaglandins to initiate labor, see 59850)

59200 Insertion of hygroscopic cervical dilator (e.g., laminaria) (separate procedure)	BR		
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REPAIR

(For tracheloplasty, see 57700)

59300 Episiotomy or vaginal repair only, by other than delivering physician; simple	2.0	0	3.0
59305 extensive	BR		3.0
59350 Hysterorrhaphy of ruptured uterus; (separate procedure)	BR		3.0
59351 following dilatation and curettage, including both procedures	BR		3.0

DELIVERY, ANTEPARTUM AND POSTPARTUM CARE

59400 Total obstetrical care (all-inclusive, "global" care) includes antepartum care, vaginal delivery (with or without episiotomy, and/or forceps or breech delivery) and postpartum care	8.0	45	3.0
59410 Vaginal delivery only (with or without episiotomy, forceps or breech delivery) including in-			

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-340, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-340, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-340, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-340, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-340, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-340, filed 1/30/74; Order 68-7, § 296-22-340, filed 11/27/68, effective 1/1/69.]

	Unit Value	Follow-up Days=	Basic Anes@
hospital postpartum care (separate procedure)	4.0	45	3.0
59420 Antepartum care only (separate procedure)	Sv.&		
59430 Postpartum care only (separate procedure)	Sv.&		

CESAREAN SECTION

(For standby attendance of infant, see 99151)

59500 Cesarean section, low cervical, including in-hospital postpartum care; (separate procedure)	10.0	7	5.0
59501 including antepartum and postpartum care	13.0	45	5.0
59520 Cesarean section, classic, including in-hospital postpartum care; (separate procedure)	10.0	7	5.0
59521 including antepartum and postpartum care	13.0	45	5.0
59540 Cesarean section, extraperitoneal, including in-hospital postpartum care; (separate procedure)	12.0	7	5.0
59541 including antepartum and postpartum care	16.0	45	5.0
59560 Cesarean section with hysterectomy, subtotal, including in-hospital postpartum care; (separate procedure)	12.0	7	6.0
59561 including antepartum and postpartum care	16.0	45	6.0
59580 Cesarean section with hysterectomy, total, including in-hospital postpartum care; (separate procedure)	12.0	7	6.0
59581 including antepartum and postpartum care	16.0	45	6.0

ABORTION

59800 Treatment of abortion, first trimester; completed medically	Sv.&		
59801 completed surgically (separate procedure)	4.0	45	3.0
59810 Treatment of abortion, second trimester; completed medically	Sv.&		
59811 completed surgically (separate procedure)	4.0	45	3.0
59820 Treatment of missed abortion, any trimester, completed medically or surgically	Sv.&		3.0
59830 Treatment of septic abortion	Sv.&		
59840 Legal (therapeutic) abortion, by dilation and curettage, and/or vacuum extraction	6.0	45	3.0
59841 Legal (therapeutic) abortion, by dilation and evacuation	6.0	45	3.0
59850 Legal (therapeutic) abortion, by one or more intra-amniotic injections (amniocentesis-injections) (including hospital admission and visits, delivery of fetus and secundines);	6.0	45	5.0
59851 with dilation and curettage	BR		
59852 with hysterotomy (failed saline)	BR		

OTHER PROCEDURES

59899 Unlisted procedure, maternity care and delivery	BR		3.0
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ENDOCRINE SYSTEM

(For pituitary and pineal surgery, see Nervous system)

WAC 296-22-350 Thyroid gland.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
*60000 Incision and drainage of thyroglossal cyst, infected	*0.6	0	3.0
EXCISION			
*60100 Biopsy, thyroid, percutaneous needle	1.2	7	
(For ultrasonic guidance, see 76942, 76943)			
60200 Excision of cyst or adenoma of thyroid, or transection of isthmus	9.5	45	5.0
60220 Total thyroid lobectomy, unilateral	14.0	45	5.0
60225* with contralateral subtotal lobectomy, including isthmus	14.0	45	5.0
60240 Thyroidectomy, total or complete	16.0	45	5.0
(60242 has been deleted, use 60245)			
60245 Thyroidectomy, subtotal or partial;	14.5	45	5.0
60246 with removal of substernal thyroid gland, cervical approach	BR		5.0
60252 Thyroidectomy, total or subtotal for malignancy; with limited neck dissection	24.0	180	5.0
60254 with radical neck dissection	28.0	180	6.0
(For parathyroid transplant, see 60510)			
60260 Thyroidectomy, secondary; unilateral	15.0	45	5.0
60261 bilateral	18.0	45	5.0
60270 Thyroidectomy, including substernal thyroid gland, sternal split or transthoric approach	BR	45	5.0
60280 Excision of thyroglossal duct cyst or sinus;	11.0	45	4.0
60281 recurrent	BR		4.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-350, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-350, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-350, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-350, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-350, filed 1/30/74; Order 68-7, § 296-22-350, filed 11/27/68, effective 1/1/69.]

WAC 296-22-355 Parathyroid, thymus, adrenal glands and carotid body.

	Unit Value	Follow-up Days=	Basic Anes@
EXCISION			
(For pituitary and pineal surgery, see Nervous System)			
60500 Parathyroidectomy or exploration of parathyroid(s);	18.0	45	5.0
60502 reexploration	BR		5.0
60505 with mediastinal exploration, sternal split or transthoric approach	24.0	60	12.0
60520 Thymectomy, partial or total (separate procedure)	18.0	60	12.0
60540 Adrenalectomy, partial or complete, or exploration of adrenal with or without biopsy, transabdominal, lumbar or dorsal (separate procedure), unilateral;	19.0	90	9.0
60545 with excision of adjacent retroperitoneal tumor	22.0	90	9.0
60550 Adrenalectomy, partial or complete, or exploration of adrenal gland with or without biopsy, transabdominal, lumbar or dorsal, bilateral; one stage	24.0	90	9.0
60555 two stages	BR		9.0
60600 Excision of carotid body tumor; without excision of carotid artery	17.0	60	8.0
60605 with excision of carotid artery	24.0	60	8.0
60699 Unlisted procedure, endocrine system	BR		5.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-355, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-355, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-355, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-355, filed 1/30/74; Order 68-7, § 296-22-355, filed 11/27/68, effective 1/1/69.]

NERVOUS SYSTEM

WAC 296-22-365 Skull, meninges, and brain.

(For injection procedure for cerebral angiography, see 36100-36220)

(For injection procedure for ventriculography, see 61025, 61030, 61120, 61130)

(For injection procedure for pneumoencephalography, see 61053, 62286)

	Unit Value	Follow-up Days=	Basic Anes@
PUNCTURE FOR INJECTION, DRAINAGE OR ASPIRATION			
*61000 Subdural tap through fontanelle (infant); unilateral or bilateral; initial	*2.0	0	
*61001 subsequent taps	*1.4	0	
*61020 Ventricular puncture through previous burr hole, fontanelle, or implanted ventricular catheter/reservoir; without injection	*2.0	0	

(61025 has been deleted. To report, use 61026)			
61026*	with injection of drug or other substance for diagnosis or treatment	BR	7.0
(61030, 61045 have been deleted. To report, use 61026)			
*61050	Cisternal or lateral cervical puncture; without injection (separate procedure)	*1.8	0
(61051, 61052, and 61053 have been deleted. To report, use 61055)			
61055*	with injection of drug or other substance for diagnosis or treatment	BR	6.0
61070*	Puncture of shunt tubing or reservoir for aspiration or injection procedure	2.0	0

BURR HOLE(S) OR TREPHINE

61105	Twist drill hole for subdural or ventricular puncture; not followed by other surgery	BR	
61106	followed by other surgery	BR	
61107	for implanting ventricular catheter or pressure recording device	8.0	30
61120	Burr hole(s) for ventricular puncture (including injection of gas, contrast media, dye, or radioactive material); not followed by other surgery	10.0	30
61130	followed by other surgery	7.0	0
61140	Burr hole(s) or trephine; with biopsy of brain or intracranial lesion	20.0	0
61150	Burr hole(s) with drainage of brain abscess or cyst	24.0	90
61151	with subsequent tapping (aspiration) of intracranial abscess or cyst	2.0	0
61154	Burr hole(s); with evacuation and/or drainage of hematoma, extradural or subdural; unilateral	26.0	90
61155	bilateral	39.0	90
61156	with aspiration of hematoma or cyst, intracerebral	25.0	90
61210	for implanting ventricular catheter, reservoir, or pressure recording device (separate procedure)	8.0	30
61215	Insertion of subcutaneous reservoir, pump or continuous infusion system for connection to ventricular catheter	BR	7.0
61250	Burr hole(s) or trephine, supratentorial, exploratory, not followed by other surgery; unilateral	15.0	30
61251	bilateral	22.0	30
61253	Burr hole(s) or trephine, infratentorial, unilateral or bilateral	BR	
(If burr hole(s) or trephine followed by craniotomy at same operative session, use 61304-61321; do not use 61250, 61251, or 61253)			

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@		
CRANIECTOMY OR CRANIOTOMY				61524	brain abscess	30.0	90	13.0	
61304	Craniectomy or craniotomy, exploratory; supratentorial	34.0	90	9.0	61524	for excision or fenestration of cyst	30.0	90	13.0
61305	infratentorial (posterior fossa)	40.0	90	10.0	61526	Craniectomy, bone flap craniotomy, transtemporal (mastoid) for excision of cerebellopontine angle tumor;	30.0	90	13.0
61310	Craniectomy or craniotomy, evacuation of hematoma, extradural, subdural or intracerebral; supratentorial	28.0	90	11.0	61530	combined with middle/posterior fossa craniotomy	BR		13.0
61311	infratentorial	26.0	90	13.0	61532	Craniectomy, trephination, bone flap craniotomy; for excision of intracranial vascular malformation	BR		13.0
61320	Craniectomy or craniotomy, drainage of intracranial abscess; supratentorial	28.0	90	11.0	61533	for insertion of epidural electrode array	BR		9.0
61321	infratentorial	28.0	90	13.0	(For continuous EEG monitoring, see 95950-95954)				
61330	Decompression of orbit only, transcranial approach; unilateral	26.0	90	9.0	61534	for excision of epileptogenic focus without electrocorticography during surgery	BR		9.0
61331	bilateral	BR		9.0	61535	for removal of epidural electrode array, without excision of cerebral tissue (separate procedure)	BR		9.0
61332	Exploration of orbit (transcranial approach); with biopsy	BR		9.0	61536	for excision of cerebral, epileptogenic focus with electrocorticography during surgery (includes removal of electrode array)	BR		9.0
61333	with removal of lesion	BR		9.0	61538	for lobectomy with electrocorticography during surgery, temporal lobe	38.0	90	9.0
61334	with removal of foreign body	BR		9.0	61539	for lobectomy with electrocorticography during surgery, other than temporal lobe, partial or total	38.0	90	9.0
61340	Other cranial decompression (e.g., subtemporal), supratentorial; unilateral	16.0	90	9.0	61541	for transection of corpus callosum	BR		9.0
61341	bilateral	24.0	90	9.0	61542	for total hemispherectomy	48.0	90	9.0
61345	Other cranial decompression, posterior fossa	22.0	90	13.0	61543	for partial or subtotal hemispherectomy	BR		9.0
(For orbital decompression by lateral wall approach, Kroenlein type, see 67440)				61544	for excision or coagulation of choroid plexus	30.0	90	11.0	
61440	Craniotomy for section of tentorium cerebelli (separate procedure)	BR		10.0	61546	Craniotomy for hypophysectomy; intracranial approach	34.0	90	10.0
61450	Craniotomy for section, compression, or decompression of sensory root of gasserian ganglion	28.0	90	10.0	61548	Hypophysectomy, transnasal or transseptal approach, nonstereotactic	BR		4.0
61458	Craniectomy, suboccipital; for exploration or decompression of cranial nerves	30.0	90	10.0	(For stereotaxis, see 61715)				
61460	for section of one or more cranial nerves	34.0	90	10.0	61550	Craniectomy for craniostenosis; single suture	18.0	90	9.0
61470	for medullary tractotomy	40.0	90	11.0	61552	multiple sutures, one stage	22.0	90	9.0
61480	for mesencephalic tractotomy or pedunculotomy	40.0	90	11.0	61553	each stage of multiple stages	BR		9.0
61490	Craniotomy for lobotomy, including cingulotomy; unilateral	24.0	90	9.0	61555	Reconstruction of skull by multiple bone flaps	BR		9.0
61491	bilateral	30.0	90	11.0	(For cranial reconstruction for orbital hypertelorism, see 21260-21263)				
61500	Craniectomy; with tumor or other bone lesion of skull	BR		8.0	(For sequestrectomy for osteomyelitis, see 21020)				
61501	for osteomyelitis	BR		8.0	61561	Reconstruction of skull by orbital advancement, including suturectomy or craniotomy; unilateral	BR		9.0
61510	Craniectomy, trephination, bone flap craniotomy; for excision of brain tumor, supratentorial; except meningioma	34.0	90	12.0	61562	bilateral	BR		9.0
61512	for excision of meningioma, supratentorial	40.0	90	11.0	61570	Craniectomy or craniotomy for excision of foreign body from brain	BR		9.0
61514	for excision of brain abscess, supratentorial	32.0		9.0					
61516	for excision or fenestration of cyst, supratentorial	30.0		11.0					
61518	Craniectomy for excision of brain tumor, infratentorial or posterior fossa; except meningioma or cerebellopontine angle tumor, or midline tumor at base of skull	40.0	90	11.0					
61519	meningioma	44.0	90	13.0					
61520	cerebellopontine angle tumor	40.0	90	11.0					
61521	midline tumor at base of skull	BR		11.0					
61522	Craniectomy, infratentorial or posterior fossa; for excision of								

Surgical Fees

296-22-365

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
61571 with treatment of penetrating wound of brain.....	BR		9.0	61855 electrodes; cortical.....	15.0	30	8.0
(For sequestrectomy for osteomyelitis, see 21020)				61860 subcortical.....	18.0	30	8.0
SURGERY FOR ANEURYSM OR ARTERIOVENOUS MALFORMATION				61865 Craniectomy or craniotomy for implantation of neurostimulator electrodes, cerebral; cortical....	15.0	30	6.0
(For excision of vascular malformation, see 61532)				61870 subcortical.....	18.0	30	6.0
61700 Surgery of intracranial aneurysm, intracranial approach; carotid circulation.....	40.0	90	13.0	61870 Craniectomy for implantation of neurostimulator electrodes, cerebellar; cortical.....	18.0	30	7.0
61702 vertebral-basilar circulation..	44.0	90	15.0	61875 subcortical.....	19.0	30	7.0
61703 Surgery of intracranial aneurysm, cervical approach by application of occluding clamp to cervical carotid artery (Selvestone-Crutchfield type).....	BR		7.0	61880 Revision or removal of intracranial neurostimulator electrodes...	BR		7.0
(For cervical approach for direct ligation of carotid artery, see 37600-37606)				61885 Incision for subcutaneous placement of neurostimulator receiver, direct or inductive coupling....	BR		7.0
61705 Surgery of aneurysm, vascular malformation or carotid-cavernous fistula; by intracranial and cervical occlusion of carotid artery.....	32.0	90	15.0	61888 Revision or removal of intracranial neurostimulator receiver....	BR		7.0
61708 by intracranial electrothrombosis.....	30.0	90	9.0	(See WAC 296-22-010, item 2)			
61710 by intra-arterial embolization, injection procedure or balloon catheter.....	24.0	90	9.0	REPAIR			
61711 Anastomosis, arterial, extracranial-intracranial (e.g., middle cerebral/cortical) arteries.....	36.0	90	15.0	62000 Elevation of depressed skull fracture; simple, extradural.....	18.0	90	9.0
(For carotid or vertebral thromboendarterectomy, see 35300)				62005 compound or comminuted, extradural.....	24.0	90	9.0
61712 Microdissection, intracranial or spinal procedure (list separately in addition to code for primary procedure).....	BR		9.0	62010 with debridement of brain and repair of dura.....	29.0	90	11.0
STEREOTAXIS				62100 Repair of dural/CSF leak, including surgery for rhinorrhea/otorrhea.....	30.0	90	9.0
(For nonstereotaxis, see 61548)				(For repair of spinal dural/CSF leak, see 63708)			
61720 Stereotactic lesion, any method, including burr hole(s) and localizing and recording techniques, single or multiple stages; globus pallidus or thalamus.....	38.0	90	8.0	62120 Repair of encephalocele, including cranioplasty.....	BR		9.0
61735 subcortical structure other than globus pallidus or thalamus.....	38.0	90	8.0	62140 Cranioplasty for skull defect, up to 5 cm diameter.....	20.0	90	9.0
61750 Stereotactic biopsy, aspiration or excision, including burr hole(s) for intracranial lesion.....	BR		8.0	62141 larger than 5 cm diameter..	BR		9.0
61751 with computerized axial tomography.....	BR		8.0	62142 Removal of bone flap or prosthetic plate of skull.....	BR		9.0
61780 Stereotactic localization, including burr hole(s), ventriculography and introduction of subcortical electrodes.....	BR+		8.0	62145 Cranioplasty for skull defect with reparative brain surgery.....	BR+		11.0
61790 Stereotactic lesion of gasserian ganglion, percutaneous, by neurolytic agent (e.g., alcohol, thermal, electrical, radiofrequency) ..	18.0	90	7.0	CSF SHUNT			
NEUROSTIMULATORS, INTRACRANIAL				62180 Ventriculocisternostomy (Torkildsen type operation).....	32.0	90	11.0
61850 Burr or twist drill hole(s) for implantation of neurostimulator				62190 Creation of shunt; subdural-atrial, -jugular, -auricular.....	24.0	90	9.0
				62192 subdural-peritoneal, -pleural, -other terminus.....	22.0	90	9.0
				62194 Replacement or irrigation, subdural catheter.....	6.0	90	5.0
				62200 Ventriculocisternostomy, third ventricle.....	32.0	90	11.0
				62220 Creation of shunt; ventriculo-atrial, -jugular, -auricular.....	26.0	90	11.0
				62223 ventriculo-peritoneal, -pleural, -other terminus.....	24.0	90	9.0
				62225 Replacement or irrigation, ventricular catheter.....	10.0	90	5.0
				62230 Replacement or revision of shunt, obstructed valve, or distal catheter in shunt system.....	20.0	90	11.0
				62256 Removal of complete shunt system; without replacement.....	10.0	90	11.0
				62258 with replacement by similar or other shunt at same operation	3.0	0	9.0
				(For percutaneous irrigation or aspiration of shunt reservoir, see 61070)			

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-365, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-365, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-365, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-365, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-365, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-365, filed 1/30/74; Order 68-7, § 296-22-365, filed 11/27/68, effective 1/1/69.]

WAC 296-22-370 Spine and spinal cord.

(For application of caliper or tongs, see 20660)

(For treatment of fracture or dislocation of spine, see 22305-22327)

	Unit Value	Follow-up Days=	Basic Anes@
62268* Percutaneous aspiration, spinal cord cyst or syrinx	BR		
(For CT guidance, see 76365, 76366; for ultrasonic guidance, see 76938, 76939)			
62269* Biopsy of spinal cord, percutaneous needle	BR		
(For CT guidance, see 76360, 76361; for ultrasonic guidance, see 76942, 76943)			
62270* Spinal puncture, lumbar; diagnostic	1.6	0	
62272* Spinal puncture, therapeutic, for drainage of spinal fluid (by needle or catheter)	BR		
62273* Injection, lumbar epidural, of blood or clot patch	2.1		
62274* Injection of anesthetic substance, diagnostic or therapeutic; subarachnoid or subdural, simple	2.1	0	
62276* subarachnoid or subdural, differential	3.5	0	
62277* subarachnoid or subdural, continuous	3.0		
62278* epidural or caudal, single	2.1	0	
62279* epidural or caudal, continuous	3.0		
62280* Injection of neurolytic substance (e.g., alcohol, phenol, iced saline solutions); subarachnoid	5.0		
62282* epidural or caudal	5.0		
62284* Injection procedure for myelography, spinal or posterior fossa	3.0	7	
(62286 has been deleted, use 64999)			
62288* Injection of substance other than anesthetic, contrast, or neurolytic solutions; subarachnoid (separate procedure)	BR		
62289* Injection of substance other than anesthetic, contrast, or neurolytic solutions; epidural or caudal	2.8		
62290* Injection procedure for diskography, single or multiple levels; lumbar	2.8		
62291* cervical	2.8		
62292 Injection procedure for chemonucleolysis; including diskography, intervertebral disc; one or more			

	Unit Value	Follow-up Days=	Basic Anes@
levels-lumbar	13.0	180	4.0
62293 Cervical	13.0	180	4.0
62294* Injection procedure, arterial, for occlusion of arteriovenous malformation, spinal	2.8		

LAMINECTOMY OR LAMINOTOMY, FOR EXPLORATION OR DECOMPRESSION

62295 Laminectomy for exploration of intraspinal canal, one or two segments; cervical	32	90	10.0
62296 thoracic	32.0	90	10.0
62297 lumbar	26.0	90	8.0
62299 sacral	26.0	90	10.0
62301 Laminectomy for exploration of intraspinal canal, more than two segments; cervical	BR		10.0
62302 thoracic	BR		10.0
62303 lumbar	BR		8.0
63001 Laminectomy for decompression of spinal cord and/or cauda equina, one or two segments; cervical	30.0	90	10.0
63003 thoracic	30.0	90	10.0
63005 lumbar, except for spondylolisthesis	24.0	90	8.0
63010 lumbar for spondylolisthesis (Gill type procedure)	28.0	90	8.0
63011 sacral	24.0	90	10.0
63015 Laminectomy for decompression of spinal cord and/or cauda equina, more than two segments; cervical	BR		10.0
63016 thoracic	BR		10.0
63017 lumbar	BR		8.0
(When followed by arthrodesis, see 22550-22565)			
63020 Laminotomy (hemilaminectomy), for herniated intervertebral disk, and/or decompression of nerve root; one interspace, cervical, unilateral	26.0	90	10.0
63021 one interspace, cervical, bilateral	28.0	90	10.0
63030 one interspace, lumbar, unilateral	25.0	90	8.0
63031 one interspace, lumbar, bilateral	27.0	90	8.0
63035 additional interspaces, cervical or lumbar	BR		10.0
63040 Laminotomy (hemilaminectomy), for herniated intervertebral disk, and/or decompression of nerve root, any level, extensive or reexploration; cervical	BR		10.0
63041 thoracic	BR		10.0
63042 lumbar	BR		8.0
(When followed by arthrodesis, see 22550-22565)			
(Do not use both 63035 and 63040-63042 for same procedure)			
63060 Hemilaminectomy (laminectomy) for herniated intervertebral disk, thoracic; posterior approach	28.0	90	8.0
63064 costovertebral approach	30.0	90	8.0
63065 Transthoracic approach for herniated intervertebral disk or other mass lesion, thoracic spine	32.7	90	8.0

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
Somatic				direct or inductive coupling	BR		
64400* Injection, anesthetic agent; trigeminal nerve, any division or branch	*3.0	0		64595 Revision or removal of peripheral neurostimulator receiver	BR		
64402* facial nerve	*2.5	0		DESTRUCTION BY NEUROLYTIC AGENT (E.G., CHEMICAL, THERMAL, ELECTRICAL, RADIOFREQUENCY) SOMATIC NERVES			
64405* greater occipital nerve	*2.5	0		64600 Destruction by neurolytic agent, trigeminal nerve; supraorbital, infraorbital, mental, or inferior alveolar branch	5.0	7	
64408* vagus nerve	*2.5	0		64605 second and third division branches at foramen ovale	5.0	30	
64410* phrenic nerve	*2.5	0		64610 second and third division branches at foramen ovale under radiologic monitoring	5.0	30	
64412* spinal accessory nerve	*2.5	0		64620 Destruction by neurolytic agent; intercostal nerve	4.0	7	
64413* cervical plexus	*2.5	0		64622 paravertebral facet joint nerve, lumbar, single level	BR		
64415* brachial plexus	*2.5	0		64623 paravertebral facet joint nerve, lumbar, each additional level	BR		
64417* axillary nerve	*2.5	0		64630 pudendal nerve	5.0		
64418* suprascapular nerve	2.0	0		64640 Other peripheral nerve or branch	5.0		
64420* intercostal nerve, single	*2.0	0		SYMPATHETIC NERVES			
64421* intercostal nerves, multiple, regional block	*2.5	0		64680 Destruction by neurolytic agent, celiac plexus, with or without radiologic monitoring	6.0	7	
64425* ilioinguinal, iliohypogastric nerves	*2.0	0		EXPLORATION, NEUROLYSIS OR NERVE DECOMPRESSION (NEUROPLASTY)			
64430* pudendal nerve	*2.5	0		Decompression or freeing of intact nerve from scar tissue, including external neurolysis and transposition			
64435* paracervical (uterine) nerve	*2.5	0		(For internal neurolysis by dissection, see 64727)			
64440* paravertebral nerve (thoracic, lumbar, sacral, coccygeal), single	*3.0	0		(For facial nerve decompression, see 69720)			
64441* paravertebral nerves, multiple, regional block	*3.2	0		64702 Neurolysis; digital, one or both, same digit	4.8	90	3.0
64442* paravertebral facet joint nerve, lumbar, single level	2.5	0		64704 same nerve of hand or foot	8.0	90	3.0
64443* paravertebral facet joint nerve, lumbar, each additional level	0.5	0		64708 Neurolysis, major peripheral nerve; arm or leg; other than specified	12.0	90	4.0
64445* sciatic nerve	*2.5	0		64712 sciatic nerve	BR		6.0
64450* other peripheral nerve or branch	*2.0	0		64713 brachial plexus	BR		6.0
(For phenol destruction, see 64600-64640)				64714 lumbar plexus	BR		6.0
(For subarachnoid or subdural, see 62274-62277)				64716 Neurolysis and/or transposition; cranial nerve (specify)	BR		6.0
(For epidural or caudal, see 62278, 62279)				64718 ulnar nerve at elbow	15.0	90	3.0
SYMPATHETIC NERVES				64719 ulnar nerve at wrist	9.0	90	3.0
64505* Injection, anesthetic agent; sphenopalatine ganglion	*3.0	0		64721 median nerve at carpal tunnel	10.0	90	3.0
64508* carotid sinus (separate procedure)	*2.5	0		64722 Decompression; unspecified nerve(s) (specify)	BR		
64510* stellate ganglion (cervical sympathetic)	*2.0	0		64726 plantar digital nerve	6.0	90	3.0
64520* lumbar or thoracic (paravertebral sympathetic)	*3.0	0		64727 Internal neurolysis by dissection, with or without microdissection (list separately in addition to code for primary neuroplasty)	BR		3.0
64530* celiac plexus, with or without radiologic monitoring	*4.0			TRANSECTION OR AVULSION OF NERVES			
NEUROSTIMULATORS, PERIPHERAL NERVE				(For stereotactic lesion of gasserian ganglion, see 61790)			
64550 Application of surface (transcutaneous) neurostimulator	BR			64732 Transection or avulsion of; supra-orbital nerve	7.0	30	3.0
64553 Percutaneous implantation of neurostimulator electrodes; cranial nerve	BR			64734 infraorbital nerve	7.0	30	3.0
64555 peripheral nerve	BR			64736 mental nerve	7.0	30	3.0
64560 autonomic nerve	BR			64738 inferior alveolar nerve by osteotomy	10.0	30	3.0
64565 neuromuscular	BR						
64573 Incision for implantation of neurostimulator electrodes; cranial nerve	BR						
64575 peripheral nerve	BR						
64577 autonomic nerve	BR						
64580 neuromuscular	BR						
64585 Revision or removal of peripheral neurostimulator electrodes	BR						
64590 Incision for subcutaneous placement of neurostimulator receiver,							

	Unit Value	Follow-up Days=	Basic Anes@
64892 Nerve graft (includes obtaining graft), single strand, arm or leg; up to 4 cm length	BR	90	3.0
64893 more than 4 cm length	BR	90	3.0
64895 Nerve graft (includes obtaining graft), multiple strands (cable), hand or foot; up to 4 cm length	BR	90	3.0
64896 more than 4 cm length	BR	90	3.0
64897 Nerve graft (includes obtaining graft), multiple strands (cable), arm or leg; up to 4 cm length	BR	90	3.0
64898 more than 4 cm length	BR	90	3.0
64901 Nerve graft, each additional nerve; single strand	BR	90	3.0
64902 multiple strands (cable)	BR	90	3.0
64905 Nerve pedicle transfer; first stage	BR	90	3.0
64907 second stage	BR	90	3.0

OTHER PROCEDURES

64999 Unlisted procedure, nervous system	BR		3.0
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[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-375, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-375, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-375, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-375, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-375, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-375, filed 1/30/74; Order 68-7, § 296-22-375, filed 11/27/68, effective 1/1/69.]

EYE AND OCULAR ADNEXA

(For diagnostic and treatment ophthalmological services, see medicine, ophthalmology, page 18, and 92002 et seq)

WAC 296-22-405 Eyeball.

(For goniotomy, see 65820)

REMOVAL OF EYE

65091 Evisceration ocular contents; without implant	10.0	30	3.0
65093 with implant	12.0	30	3.0
65101 Enucleation of eye, without implant	10.0	30	3.0
65103 with implant, muscles not attached to implant	11.0	30	3.0
65105 with, muscles attached to implant, muscles attached to implant	12.0	30	3.0

(For conjunctivoplasty after enucleation, see 68320 et seq)

65110 Exenteration orbit (does not include skin graft), removal orbital contents; only	20.0	60	4.0
65112 with therapeutic removal of bone	BR		4.0
65114 with temporalis muscle transplant	25.0	60	4.0

(For skin graft to orbit (split skin), see 15120, 15121; free, full thickness, see 15260, 15261)

(For eyelid repair involving more than skin, see 67930 et seq)

SECONDARY IMPLANT PROCEDURES

An ocular implant is an implant inside muscular cone; an orbital implant is an implant outside muscular cone.

65130 Insertion ocular implant secondary; after evisceration, in scleral shell	8.0	30	4.0
65135 after enucleation, muscles not attached to implant	10.0	30	4.0
65140 after enucleation, muscles attached to implant	14.0	30	4.0
65150 Reinsertion ocular implant; with or without conjunctival graft	BR		4.0
65155 with use of foreign material for reinforcement and/or attachment of muscles to implant	BR		4.0
65175 Removal ocular implant	BR		4.0

(For orbital implant (implant outside muscle cone) insertion, see 67550; removal, see 67560)

REMOVAL OF OCULAR FOREIGN BODY

(For removal of implanted material: Ocular implant, see 65175; anterior segment implant, see 65920; posterior segment implant, see 67120; orbital implant, see 67560)

(For diagnostic x-ray for foreign body, see 70030-70050)

(For diagnostic echography for foreign body, see 76529)

(For removal of foreign body from orbit: Frontal approach, see 67413; lateral approach, see 67430; transcranial approach, see 61334)

(For removal of foreign body from eyelid, embedded, see 67938)

(For removal of foreign body from lacrimal system, see 68530)

65205* Removal foreign body, external eye; conjunctival superficial	0.2	0	4.0
65210* conjunctival embedded (includes concretions), subconjunctival, or scleral nonperforating	0.6	0	4.0
65220* corneal, without slit lamp	0.6	0	4.0
65222* corneal, with slit lamp	0.8	0	4.0

(For repair of corneal laceration with foreign body, see 65275)

65230 Removal foreign body intraocular; from anterior chamber, magnetic extraction	12.0	45	6.0
65235 from anterior chamber, non-magnetic extraction	16.0	45	8.0
65240 from lens (without extraction lens), magnetic extraction	12.0	30	6.0
65245 from lens (without extraction lens), nonmagnetic extraction	BR		8.0

(For removal implanted material anterior segment, see 65920)

Surgical Fees

296-22-410

	Unit Value	Follow-up Days=	Basic Anes@
65260 from posterior segment, magnetic extraction, anterior or posterior route	12.0	30	6.0
65265 from posterior segment, non-magnetic extraction	18.0	30	8.0

(For paracentesis of cornea, see 65800-65815)

(For removal of foreign body, cornea, see 65220-65222)

REPAIR OF LACERATION OF EYEBALL

(For fracture of orbit, see 21380 et seq)

(For repair wound of eyelid, skin, linear, simple, see 12011-12018; intermediate, layered closure, see 12051-12057; linear, complex, see 13150-13300; other, see 67930-67935)

(For repair wound of lacrimal system, see 68700)

(For repair operative wound, see 66250)

65270* Repair laceration; conjunctiva, with or without nonperforating laceration sclera, direct closure	0.9	0	4.0
65272 conjunctiva, by mobilization and rearrangement, without hospitalization	BR		4.0
65273 conjunctiva, by mobilization and rearrangement, with hospitalization	BR		4.0
65275 cornea, nonperforating, with or without removal foreign body	SV		4.0
65280 cornea and/or sclera, perforating, not involving uveal tissue	BR	30	5.0
65285 cornea and/or sclera, perforating, with reposition or resection of uveal tissue	15.4	30	6.0

(Repair of laceration includes use of conjunctival flap and restoration of anterior chamber, by air or saline injection when indicated)

(For repair of iris or ciliary body, see 66680)

65290 Repair wound extraocular muscle, tendon and/or Tenon's capsule	4.4	30	4.0
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[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-405, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-405, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-22-405, filed 11/30/81, effective 1/1/82; 80-18-055 (Order 80-25), § 296-22-405, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-405, filed 1/30/74; Order 68-7, § 296-22-405, filed 11/27/68, effective 1/1/69.]

WAC 296-22-410 Anterior segment--Cornea.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
65300 Delimiting keratotomy	2.0	15	3.0

EXCISION

65400 Excision lesion cornea (keratectomy, lamellar, partial), except pterygium	8.0	30	3.0
65410* Biopsy cornea	1.0	0	3.0
65420 Excision or transposition, pterygium; without graft	6.0	30	3.0
65426 with graft	BR		3.0

REMOVAL OR DESTRUCTION

65430* Scraping cornea, diagnostic, for smear and/or culture	0.4	0	4.0
65435* Removal corneal epithelium; with or without chemocauterization (abrasion, curettage)	1.0	0	4.0
65436 with application of chelating agent, e.g., EDTA	BR		

(65445, 65455 have been deleted, use 65450)

65450 Destruction of lesion of cornea by cryotherapy; photocoagulation or thermocauterization	1.6	7	4.0
65600 Tattoo of cornea, mechanical or chemical	8.0	30	3.0

KERATOPLASTY

(Corneal transplant includes preparation of donor material)

65710 Keratoplasty (corneal transplant) lamellar; autograft	24.0	90	8.0
65720 homograft, fresh	24.0	90	8.0
65725 homograft, preserved	24.0	90	8.0
65730 Keratoplasty (corneal transplant) penetrating (except in aphakia); autograft	30.0	90	8.0
65740 homograft, fresh	30.0	90	8.0
65745 homograft, preserved	30.0	90	8.0
65750 Keratoplasty (corneal transplant) penetrating, in aphakia	30.0	90	8.0

OTHER PROCEDURES

65760 Keratomileusis	30.0	90	8.0
65765 Keratophakia	30.0	90	8.0
65767 Epikeratophakia	BR	90	8.0
65770 Keratoprosthesis	32.0	90	8.0

(For fitting of contact lens for treatment of disease, see 92070)

(For unlisted procedures on cornea, see 66999)

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-410, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-410, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-410, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-410, filed 1/30/74; Order 68-7, § 296-22-410, filed 11/27/68, effective 1/1/69.]

WAC 296-22-425 Anterior segment--Lens.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
66800			
Discussion of lens capsule; incisional technique (needling of lens); initial	5.0	45	3.0
66801			
subsequent	2.4	45	3.0
66802			
laser surgery (one or more stages)	BR	45	3.0
66820			
Discussion of secondary membranous cataract ("after cataract") and/or anterior hyaloid; incisional technique (Ziegler or Wheeler Knife)	5.0	45	3.0
66821			
laser surgery (one or more stages)	BR	45	3.0

REMOVAL CATARACT

66830			
Removal of secondary membranous cataract ("after cataract"), with corneoscleral section, with or without iridectomy (iridocapsulotomy, iridocapsulectomy)	12.0	90	3.0
66840			
Removal of lens material; aspiration technique, one or more stages	12.0	30	3.0
66850			
phacofragmentation technique (mechanical or ultrasonic, e.g., phacoemulsification), with aspiration	16.0	90	3.0
66915			
Expression lens, linear, one or more stages	20.0	90	3.0
66920			
Extraction lens with or without iridectomy; intracapsular, with or without enzymes	20.0	90	3.0
66930			
intracapsular, for dislocated lens	22.0	90	3.0
66940			
extracapsular (other than 66840, 66850, 66915)	20.0	90	3.0
66945			
in presence of fistulization bleb and/or by temporal, inferior or inferotemporal route, intracapsular or extracapsular	22.0	90	3.0

Preliminary iridectomy, done as a separate procedure prior to extraction of lens, is included in the listed extraction of lens

(For removal of intralenticular foreign body without lens extraction, see 65240-65245)

(For repair of operative wound, see 66250)

ANTERIOR SEGMENT--OTHER PROCEDURES

(66980 Cataract extraction with lens implantation has been deleted. To report, see 66983, 66984)			
66983			
Intracapsular cataract extraction with insertion of intraocular lens prosthesis (one stage procedure) ..	BR		3.0
66984			
Extracapsular cataract removal with insertion of intraocular lens prosthesis (one stage procedure), manual or phacoemulsification technique	BR		3.0
66985			
insertion of intraocular lens subsequent to cataract extraction (separate procedure)	BR		3.0

(For removal of implanted material from anterior segment, see 65920)

(For intraocular lens prosthesis supplied by physician, see 99070)

(For ultrasonic determination of intraocular lens power, see 76516, 76517)

(For secondary fixation (separate procedure), see 66682)

66999 Unlisted procedure, anterior segment of eye

Unit Value Follow-up Days= Basic Anes@

BR 3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-425, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-425, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-22-425, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-425, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-425, filed 1/30/74; Order 68-7, § 296-22-425, filed 11/27/68, effective 1/1/69.]

WAC 296-22-427 Posterior segment--Vitreous.

	Unit Value	Follow-up Days=	Basic Anes@
67005			
Removal of vitreous, anterior approach (open sky technique or limbal incision); partial removal ..	BR		3.0
67010			
subtotal removal with mechanical vitrectomy (such as VISC or rotoextractor)	BR		3.0
(For removal of vitreous by paracentesis of anterior chamber, see 65810)			
(For removal of corneovitreous adhesions, see 65880)			
67015			
Aspiration or release of vitreous, subretinal or choroidal fluid, pars plana approach (posterior sclerotomy)	9.0	15	3.0
67025			
Injection of vitreous substitute, pars plana approach (separate procedure), excludes air or balanced salt solutions	12.0	30	3.0
67030			
Discission of vitreous strands (without removal), pars plana approach	BR		3.0
67031			
Severing of vitreous strands, vitreous face adhesions, sheets, membranes, or opacities, laser surgery (one or more stages)	BR		3.0
(67035 has been deleted. To report use 67036)			
67036			
Vitrectomy, mechanical, pars plana approach	BR		3.0
(For associated lensectomy, see 66850)			
(For use of vitrectomy in retinal detachment surgery, see 67108)			
(For associated removal of foreign body, see 65260-65265)			
(For unlisted procedures on vitreous, see 67299)			

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-427, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-427, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-427, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-427, filed 1/30/74. Formerly WAC 296-22-425.]

WAC 296-22-430 Posterior segment--Retinal detachment.

REPAIR

(If diathermy, cryotherapy and/or photocoagulation are combined, report under principle modality used)

(67102, 67103 have been deleted, use 67101)

(67104, 67106 have been deleted, use 67105)

	Unit Value	Follow-up Days=	Basic Anes@
67101 Repair of retinal detachment, one or more sessions, same hospitalization; cryotherapy or diathermy, with or without drainage of subretinal fluid	BR		3.0
67105 photocoagulation (laser or xenon arc, one or more sessions) with drainage of subretinal fluid	22.0		3.0
67107 scleral buckling (such as lamellar excision, imbrication, or encircling procedure), with or without implant, may include procedures 67101-67105	30.0	90	8.0
67108 with vitrectomy, any method, with or without air tamponade, may include procedures 67101-67107 and/or removal of lens by same technique	30.0	120	5.0
67109 by technique other than 67101-67108	BR		3.0
67112 previously operated upon, any technique	BR		3.0
(For aspiration or drainage of subretinal or subchoroidal fluid, see 67015)			
67115 Release of encircling material (posterior segment)	BR		3.0
67120 Removal implanted material, posterior segment extraocular	BR		3.0
67121 intraocular	BR		3.0
(For removal from anterior segment, use 65920)			
(For removal of foreign body, see 65260, 65265)			

PROPHYLAXIS

Repetitive services. The services listed below are often performed in multiple sessions or groups of sessions. The methods of reporting vary. The following descriptors are intended to include all sessions in a defined treatment period.

67141 Prophylaxis of retinal detachment (e.g., retinal break, lattice degeneration), without drainage, one or more sessions; cryotherapy, diathermy	10.0	30	3.0
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67145 photocoagulation (laser or xenon arc)	10.0	30	3.0
(67142-67143 have been deleted, use 67141)			
(67144, 67146 have been deleted, use 67145)			

POSTERIOR SEGMENT--OTHER PROCEDURES

DESTRUCTION--RETINA, CHOROID

67208 Destruction of localized lesion of retina (e.g. maculopathy, chorioidopathy, small tumors), one or more sessions; cryotherapy, diathermy	10.0	30	3.0
67210 photocoagulation, (laser or xenon arc)	10.0	30	3.0
(67212-67213 have been deleted, use 67208)			
(67214-67216 have been deleted, use 67210)			
67218 radiation by implantation of source (includes removal of source)	BR		3.0
67227 Destruction of extensive or progressive retinopathy (eg, diabetic), one or more sessions; cryotherapy, diathermy	12.0	30	3.0
67228 photocoagulation (laser or xenon arc)	12.0	30	3.0
(67222-67223 have been deleted, use 67227)			
(67224-67226 have been deleted, use 67228)			
(For unlisted procedures on retina, see 67299)			

SCLERAL REPAIR

(For excision lesion sclera, see 66130)			
67250 Scleral reinforcement (separate procedure); without graft	22.0	90	3.0
67255 with graft	24.0	90	3.0
(For repair scleral staphyloma, see 66220-66225)			
67299 Unlisted procedure, posterior segment	BR		3.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-430, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-430, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-430, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-430, filed 1/30/74; Order 68-7, § 296-22-430, filed 11/27/68, effective 1/1/69.]

WAC 296-22-445 Ocular adnexa--Eyelids.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION			
*67700 Blepharotomy, drainage abscess eyelid	*0.4	0	3.0
67710 Severing tarsorrhaphy	0.4	0	3.0

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
67715	0.4	0	3.0	67904	16.0	60	3.0
Canthotomy (separate procedure)				(tarso) levator resection, external approach			
(For canthoplasty, see 67950)				67906 superior rectus technique with fascial sling (includes obtaining fascia)			
(For division symblepharon, see 68340)				67907 superior rectus tendon transplant			
EXCISION OR REMOVAL OF LESION INVOLVING MORE THAN SKIN (I.E., INVOLVING LID MARGIN, TARSUS AND/OR PALPEBRAL CONJUNCTIVA")				67908 conjunctivo-tarso-levator resection (Fasanella-Servat type)			
(For removal of lesion, involving mainly skin of eyelid, see 11440-11446; 11640-11646; 17000-17010)				67909 Reduction of overcorrection of ptosis			
(For repair wounds, blepharoplasty, grafts, reconstructive surgery, see 67930-67975)				67911 Correction of lid retraction			
67800	1.2	15	3.0	REPAIR ECTROPION, ENTROPION			
67801	1.4	15	3.0	(For correction trichiasis by mucous membrane graft, see 67835)			
67805	1.6	15	3.0	67914	1.6	15	3.0
67808				67915	1.4	15	3.0
under general anesthesia and/or requiring hospitalization, single or multiple				67916	9.0	60	3.0
67810*	3.2	30	3.0	67917	11.0	60	3.0
*67820	1.0	37	3.0	(For correction everted punctum, see 68705)			
Biopsy eyelid				67921	1.6	15	3.0
*67825	*0.4	0		67922	1.4	15	3.0
Correction trichiasis; epilation, forceps only				67923	9.0	60	3.0
67825	*1.0	0	3.0	67924	11.0	60	3.0
epilation, (e.g., by electro-surgery or cryotherapy)				(For repair cicatricial ectropion or entropion requiring scar excision or skin graft, see also 67961 et seq.)			
67830	BR		3.0	RECONSTRUCTIVE SURGERY, BLEPHAROPLASTY INVOLVING MORE THAN SKIN (I.E., INVOLVING LID MARGIN, TARSUS, AND/OR PALPEBRAL CONJUNCTIVA)			
67835	BR		3.0	67930	1.6	15	3.0
incision lid margin, with free mucous membrane graft				67935	3.4	30	3.0
67840*	1.6	0	3.0	67938	BR		3.0
Excision of lesion of eyelid (except chalazion) without closure or with simple direct closure				(For repair skin of eyelid, see 12011-12018; 12051-12057; 13150-13300)			
(For excision and repair of eyelid by reconstructive surgery, see 67961-67966)				(For repair lacrimal canaliculi, see 68700)			
67850*	1.6	0	3.0	(For tarsorrhaphy, canthorrhaphy, see 67880-67882)			
Destruction of lesion of lid margin (up to 1 cm)				(For repair blepharoptosis and lid retraction, see 67901-67911)			
(For chemosurgery technique of malignancies of skin, see 17300-17302)				(For blepharoplasty for entropion, ectropion, see 67916, 67917, 67923, 67924)			
(For initiation or follow-up care of topical chemotherapy, e.g., 5-FU or similar agents, see appropriate office visits)				(For correction blepharochalasis (blepharorhytidectomy), see 15820-15823)			
TARSORRHAPHY				(For repair skin of eyelid, adjacent tissue transfer, see 14060, 14061; preparation for graft, see 15000; free graft, see 15120, 15121, 15260, 15261)			
67880	2.0	30	3.0	REPAIR BLEPHAROPTOSIS, LID RETRACTION			
Construction intermarginal adhesions, median tarsorrhaphy, or canthorrhaphy;				67901	12.0	60	3.0
67882	14.0	60	3.0	Repair blepharoptosis; frontalis muscle technique with suture ...			
with transposition of tarsal plate				67902	16.0	60	3.0
(For severing of tarsorrhaphy, see 67710)				frontalis muscle technique with fascial sling (includes obtaining fascia)			
(For canthoplasty, reconstruction canthus, see 67950)				67903 (tarso) levator resection, internal approach			
(For canthotomy, see 67715)							

	Unit Value	Follow-up Days=	Basic Anes@
(For excision lesion of eyelid, see 67800 et seq.)			
(For repair lacrimal canaliculi, see 68700)			
67950 Canthoplasty (reconstruction of canthus)	BR		3.0
67961 Excision and repair of eyelid, involving lid margin, tarsus, conjunctiva, canthus, or full thickness, may include preparation for skin graft or pedicle flap with adjacent tissue transfer or rearrangement; up to one-fourth of lid margin	12.0	60	3.0
67966 over one-fourth of lid margin	15.0	60	3.0
(For canthoplasty, see 67950)			
(For free skin grafts, see 15120, 15121, 15260, 15261)			
(For tubed pedicle flap preparation, see 15515; for delay, see 15630; for attachment, see 15555)			
67971 Reconstruction eyelid full thickness by transfer of tarsoconjunctival flap from opposing eyelid; up to two-thirds of eyelid, one stage or first stage	15.0	60	3.0
67973 total eyelid, lower, one stage or first stage	17.0	60	3.0
67974 total eyelid, upper, one stage or first stage	20.0	60	3.0
67975 second stage	2.4	60	3.0
OTHER PROCEDURES			
67999 Unlisted procedure, eyelids	BR		3.0
(For cicatricial ectropion or entropion requiring scar excision, skin graft, etc., see 15100-15260)			

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-445, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-445, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-445, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-445, filed 1/30/74; Order 68-7, § 296-22-445, filed 11/27/68, effective 1/1/69.]

AUDITORY SYSTEM

(For diagnostic services, e.g., audiometry, vestibular tests, see 92502 et seq.)

WAC 296-22-475 Inner ear.

	Unit Value	Follow-up Days=	Basic Anes@
INCISION, DESTRUCTION			
69801 Labyrinthotomy, with or without cryosurgery or other nonexcisional destructive procedures or tack procedure; transcanal	20.0	180	6.0
69802 with mastoidectomy	BR		6.0
69805 Endolymphatic sac operation; without shunt	BR		6.0

	Unit Value	Follow-up Days=	Basic Anes@
69806 with shunt	BR		6.0
69820 Fenestration semicircular canal	22.0	180	6.0
69840 Revision fenestration operation	11.0	180	6.0

EXCISION

69905 Labyrinthectomy; transcanal	BR		6.0
69910 with mastoidectomy	BR		6.0
69915 Vestibular nerve section, translabyrinthine approach	BR	180	6.0
(For transcranial approach, see 69950)			

INSERTION

69930 Cochlear device implantation, with or without mastoidectomy	BR		
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OTHER PROCEDURES

69949 Unlisted procedure, inner ear	BR		6.0
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TEMPORAL BONE, MIDDLE FOSSA APPROACH

(For external approach, see 69535)

69950 Vestibular nerve section, transcranial approach	BR		6.0
69955 Total facial nerve decompression and/or repair (may include graft)	BR		6.0
69960 Decompression internal auditory canal	BR		6.0
69965 Eustachian tuboplasty	BR		6.0
69970 Removal of tumor	BR		6.0

OTHER PROCEDURES

69979 Unlisted procedure, temporal bone, middle fossa approach	BR		6.0
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[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-22-475, filed 7/23/87; 86-06-032 (Order 86-19), § 296-22-475, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 80-18-055 (Order 80-25), § 296-22-475, filed 12/3/80, effective 3/1/81; Order 74-7, § 296-22-475, filed 1/30/74; Order 68-7, § 296-22-475, filed 11/27/68, effective 1/1/69.]

Chapter 296-23 WAC

RADIOLOGY, RADIATION THERAPY, NUCLEAR MEDICINE, PATHOLOGY, HOSPITAL, CHIROPRACTIC, PHYSICAL THERAPY, DRUGLESS THERAPEUTICS, NURSING, AND VOCATIONAL SERVICES

WAC

RADIOLOGY

296-23-01006	Radiology, radiation therapy, nuclear medicine and modifiers.
296-23-015	Head and neck.
296-23-020	Chest.
296-23-025	Spine and pelvis.
296-23-030	Upper extremities.
296-23-035	Lower extremities.
296-23-040	Abdomen.
296-23-045	Gastrointestinal tract.
296-23-050	Urinary tract.
296-23-055	Female genital tract.
296-23-065	Vascular system.
296-23-079	Miscellaneous.
296-23-07902	Head and neck.

- 296-23-07903 Heart.
 296-23-07904 Thorax.
 296-23-07905 Abdomen and retroperitoneum.
 296-23-07906 Obstetrics, gynecology and pelvis.
 296-23-07907 Vascular studies.
 296-23-07908 Miscellaneous.
- THERAPEUTIC RADIOLOGY**
- 296-23-080 Radiotherapy—General information and instructions.
 296-23-115 Repealed.
- NUCLEAR MEDICINE**
- 296-23-125 Diagnostic.
- PATHOLOGY**
- 296-23-20102 Pathology modifier.
 296-23-204 Panel or profile tests.
 296-23-212 Chemistry and toxicology.
 296-23-216 Hematology.
 296-23-221 Immunology.
 296-23-224 Microbiology.
 296-23-228 Anatomic pathology.
 296-23-232 Miscellaneous.
- HOSPITAL**
- 296-23-300 Repealed.
- HOSPITAL RULES**
- 296-23-301 Repealed.
 296-23-305 Repealed.
 296-23-310 Repealed.
 296-23-315 Repealed.
 296-23-330 Repealed.
 296-23-335 Repealed.
 296-23-340 Repealed.
 296-23-356 Repealed.
 296-23-357 Repealed.
- MISCELLANEOUS SERVICES AND APPLIANCES**
- 296-23-500 Miscellaneous services and appliances.
 296-23-50014 Stimulators.
- CHIROPRACTIC**
- 296-23-615 Office visits and special services.
- PHYSICAL THERAPY**
- 296-23-715 Modalities.
 296-23-725 Tests and measurements.
- DRUGLESS THERAPUTICS**
- 296-23-811 Office visits and special services.
- VOCATIONAL SERVICES**
- 296-23-980 Occupational therapy services.
- DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER**
- 296-23-115 Special adjunctive services. [Statutory Authority: RCW 51.04.020(4) and 51.04.030. 83-16-066 (Order 83-23), § 296-23-115, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-115, filed 12/23/80, effective 3/1/81; Order 74-7, § 296-23-115, filed 1/30/74.] Repealed by 87-16-004 (Order 87-18), filed 7/23/87. Statutory Authority: RCW 51.04.020(4) and 51.04.030.
- 296-23-300 General statement. [Statutory Authority: RCW 51.04.020(4) and 51.04.030. 86-20-074 (Order 86-36), § 296-23-300, filed 10/1/86, effective 11/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-300, filed 12/23/80, effective 3/1/81; Order 75-39, § 296-23-300, filed 11/28/75, effective 1/1/76; Order 68-7, § 296-23-300, filed 11/27/68, effective 1/1/69.] Repealed by 87-03-005 (Order 86-47), filed 1/8/87. Statutory Authority: RCW 51.04.020(4) and 51.04.030.
- 296-23-301 Rates for daily and ancillary services. [Statutory Authority: RCW 51.04.020(4) and 51.04.030. 86-20-074 (Order 86-36), § 296-23-301, filed 10/1/86, effective 11/1/86; 86-04-035 (Order 86-15), § 296-23-301, filed 1/30/86. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-301, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-301, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-23-301, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-23-301, filed 11/28/75, effective 1/1/76.] Repealed by 87-03-005 (Order 86-47), filed 1/8/87. Statutory Authority: RCW 51.04.020(4) and 51.04.030.
- 296-23-305 Questionable beneficiary. [Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-305, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-23-305, filed 11/24/76, effective 1/1/77; Order 70-12, § 296-23-305, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-23-305, filed 11/27/68, effective 1/1/69.] Repealed by 87-03-005 (Order 86-47), filed 1/8/87. Statutory Authority: RCW 51.04.020(4) and 51.04.030.
- 296-23-310 Refund of incorrect payments. [Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-310, filed 12/23/80, effective 3/1/81; Order 68-7, § 296-23-310, filed 11/27/68, effective 1/1/69.] Repealed by 87-03-005 (Order 86-47), filed 1/8/87. Statutory Authority: RCW 51.04.020(4) and 51.04.030.
- 296-23-315 Treatment of unrelated conditions. [Statutory Authority: RCW 51.04.020(4) and 51.04.030. 83-16-066 (Order 83-23), § 296-23-315, filed 8/2/83; Order 70-12, § 296-23-315, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-23-315, filed 11/27/68, effective 1/1/69.] Repealed by 87-03-005 (Order 86-47), filed 1/8/87. Statutory Authority: RCW 51.04.020(4) and 51.04.030.
- 296-23-330 Closed claims. [Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-330, filed 12/23/80, effective 3/1/81; Order 74-7, § 296-23-330, filed 1/30/74; Order 70-12, § 296-23-330, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-23-330, filed 11/27/68, effective 1/1/69.] Repealed by 87-03-005 (Order 86-47), filed 1/8/87. Statutory Authority: RCW 51.04.020(4) and 51.04.030.
- 296-23-335 RX's take home. [Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-335, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-23-335, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-23-335, filed 11/28/75, effective 1/1/76; Order 68-7, § 296-23-335, filed 11/27/68, effective 1/1/69.] Repealed by 87-03-005 (Order 86-47), filed 1/8/87. Statutory Authority: RCW 51.04.020(4) and 51.04.030.
- 296-23-340 Routine laboratory procedures on admission. [Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-340, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-23-340, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-23-340, filed 11/28/75, effective 1/1/76; Order 74-39, § 296-23-340, filed 11/22/74, effective 1/1/75; Order 68-7, § 296-23-340, filed 11/27/68, effective 1/1/69.] Repealed by 87-03-005 (Order 86-47), filed 1/8/87. Statutory Authority: RCW 51.04.020(4) and 51.04.030.
- 296-23-356 Billing procedures. [Statutory Authority: RCW 51.04.020(4) and 51.04.030. 86-20-074 (Order 86-36), § 296-23-356, filed 10/1/86, effective 11/1/86; 83-16-066 (Order 83-23), § 296-23-356, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-356, filed 11/30/81, effective 1/1/82; 81-

01-100 (Order 80-29), § 296-23-356, filed 12/23/80, effective 3/1/81; Order 77-27, § 296-23-356, filed 11/30/77, effective 1/1/78; Emergency Order 77-26, § 296-23-356, filed 12/1/77; Emergency Order 77-16, § 296-23-356, filed 9/6/77; Order 76-34, § 296-23-356, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-23-356, filed 11/28/75, effective 1/1/76; Order 74-39, § 296-23-356, filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-356, filed 1/30/74; Order 71-6, § 296-23-356, filed 6/1/71; Order 70-12, § 296-23-356, filed 12/1/70, effective 1/1/71. Formerly WAC 296-23-355 (part).] Repealed by 87-03-005 (Order 86-47), filed 1/8/87. Statutory Authority: RCW 51.04.020(4) and 51.04.030.

296-23-357 X-rays. [Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-357, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-357, filed 12/23/80, effective 3/1/81; Order 77-27, § 296-23-357, filed 11/30/77, effective 1/1/78; Emergency Order 77-26, § 296-23-357, filed 12/1/77; Emergency Order 77-16, § 296-23-357, filed 9/6/77; Order 76-34, § 296-23-357, filed 11/24/76, effective 1/1/77; Order 74-7, § 296-23-357, filed 1/30/74.] Repealed by 87-03-005 (Order 86-47), filed 1/8/87. Statutory Authority: RCW 51.04.020(4) and 51.04.030.

RADIOLOGY

WAC 296-23-01006 Radiology, radiation therapy, nuclear medicine and modifiers. Listed services and procedures may be modified under certain circumstances. When applicable, the modifying circumstance should be identified by the addition of the appropriate modifier code which is a two digit number placed after the usual procedure number from which it is separated by a hyphen. If more than one modifier is used, the "multiple modifiers" code placed first after the procedure code indicates that one or more additional modifier codes will follow. Modifiers commonly used in RADIOLOGY (INCLUDING NUCLEAR MEDICINE AND DIAGNOSTIC ULTRASOUND) are as follows:

- 22 UNUSUAL SERVICES: When the service(s) provided is greater than that usually required for the listed procedure, it may be identified by adding modifier '-22' to the usual procedure number. List modified value. A report may also be appropriate. Note: Modifier -22 may be utilized with computerized tomography numbers when additional slices are required or a more detailed examination is necessary.
- 25 DIGITAL RADIOLOGY (e.g., digital subtraction angiography, digital fluoroscopy, digital radiography): When this technique is utilized, the modifier '-25' may be appended to the appropriate five digit number of the radiologic procedure to indicate that the digital modality was applied. The modifier would be applied to both the supervision and interpretation service and complete procedure. When the supervision and interpretation service code is utilized and the injection is done by a second physician, the modifier need not be applied to the surgical injection codes.
- 26 PROFESSIONAL COMPONENT: Certain procedures (e.g., laboratory, radiology, electrocardiogram, specific diagnostic and therapeutic services,) are a combination of a physician component and a technical component. When the physician component is billed separately, the procedure may be identified by adding the modifier '-26' to the usual procedure number and value as appropriate. The total cost of procedure cannot exceed the basic unit value. Payment is made on the basis of up to and including forty percent of the fee maximum.
- 27 TECHNICAL COMPONENT: Certain procedures (e.g., laboratory, radiology, electrocardiogram, specific diagnostic and therapeutic services) are a combination of a physician component and a technical component. When the technical component is billed separately, the procedure may be identified by adding the modifier '-27' to the usual procedure number and value as appropriate. The total cost of procedure cannot exceed the basic unit value. Payment is made on the basis of up to and including sixty percent of the fee maximum.
- 50 MULTIPLE OR BILATERAL PROCEDURES: When multiple or bilateral procedures are provided at the same operative session, the first major procedure may be reported as listed. The secondary or lesser procedure(s) may be identified by adding the modifier '-50' to the usual procedure number(s) and value at 50 percent of the listed values unless otherwise indicated.
- 52 REDUCED SERVICES: Under certain circumstances a service or procedure is partially reduced or eliminated at the physician's election. Under these circumstances the service provided can be identified by its usual procedure number and the addition of the modifier '-52' signifying that the service is reduced. This provides a means of reporting reduced services at reduced charge without disturbing the identification of the basic service. Note: Modifier -52 may be utilized with computerized tomography numbers for a limited study or a follow-up study.
- 62 TWO SURGEONS: Under certain circumstances the skills of two surgeons (usually with different skills) may be required in the management of a specific surgical procedure. Under such circumstances the services of each may be identified by adding the modifier '-62' to the procedure number used by each surgeon for reporting his services.
- 66 SURGICAL TEAM: Under some circumstances, highly complex procedures (requiring the concomitant services of several physicians, often of different specialties, plus other highly skilled, specially trained personnel and various types of complex equipment) are carried out under the 'surgical team' concept. Such circumstances may be identified by each participating physician with the addition of the modifier '-66' to the basic procedure number used for reporting services.

			Unit Value
-75 CONCURRENT CARE, SERVICES RENDERED BY MORE THAN ONE PHYSICIAN: When the patient's condition requires the additional services of more than one physician, each physician may identify his or her services by adding the modifier '-75' to the basic service performed.		(70022 has been deleted. To report CT guidance for stereotactic localization, use 76355)	
-76 REPEAT PROCEDURE BY SAME PHYSICIAN: The physician may need to indicate that a procedure or service was repeated subsequent to the original service. This may be reported by adding the modifier '-76' to the procedure code of the repeated service.	70030	Radiologic examination, eye, for detection of foreign body	8.8
	70040	for localization of foreign body (does not include detection)	14.0
	70050	for detection and localization of foreign body	18.0
	70100	Radiologic examination, mandible, less than four views	6.0
	70110	complete, minimum of four views	10.0
-77 REPEAT PROCEDURE BY ANOTHER PHYSICIAN: The physician may need to indicate that a basic procedure performed by another physician had to be repeated. This may be reported by adding modifier '-77' to the repeated service.	70120	Radiologic examination, mastoid(s), less than three views per side	6.0
	70130	complete minimum of three views per side	12.0
	70134	Radiologic examination, internal auditory meati, complete	12.0
-80 ASSISTANT SURGEON: Surgical assistant services may be identified by adding the modifier '-80' to the usual procedure number(s).	70140	Radiologic examination, facial bones, less than three views	6.0
	70150	complete, minimum of three views	10.0
	70160	Radiologic examination, nasal bones complete, minimum of three views	6.4
-90 REFERENCE (OUTSIDE) LABORATORY: When laboratory procedures are performed by a party other than the treating or reporting physician the procedure(s) may be identified by adding the modifier '-90' to the usual procedure number and shall be billed as charged to the physician.	70170	Nasolacrimal duct (dacryocystography) supervision and interpretation only	4.0
	70171	complete procedure	10.0
		(For injection procedure for dacryocystography, see 68850)	
	70190	Radiologic examination, optic foramina, orbits, complete, minimum of four views	6.0
	70200	Paranasal sinuses, less than three views	8.0
-99 MULTIPLE MODIFIERS: Under certain circumstances two or more modifiers may be necessary to completely delineate a service. In such situations modifier '-99' should be added to the basic procedure, and other applicable modifiers may be listed as a part of the description of the service. Value in accordance with appropriate modifiers.	70210	Radiologic examination, sinuses, paranasal, complete, minimum of three views	5.0
	70220		8.8
		(70230, 70231 have been deleted. To report, use 76499)	
	70240	Radiologic examination, sella turcica	5.0
	70250	Radiologic examination, skull, limited, less than four views, with or without stereo	6.0
	70260	complete, minimum of four views, with or without stereo	12.0
	70300	Radiologic examination, teeth, single view	2.0
	70310	partial examination, less than full mouth	4.0
	70320	complete examination, full mouth	8.0
	70328	Radiologic examination, temporomandibular joints, unilateral, open and closed mouth	6.0
	70330	bilateral	8.8
	70332	Temporomandibular joint arthrotomography (includes a contrast arthrogram and appropriate laminographic studies); supervision and interpretation only	8.4
	70333	complete procedure	21.1
		(For injection procedure only for arthrotomography, see 21116)	
	70350	Cephalogram (orthodontic)	4.0
	70355	Orthopantomogram	10.0
	70360	Radiologic examination, neck for soft tissues	4.0
	70370	pharynx or larynx, including fluoroscopy and/or magnification technique	8.0
	70373	Laryngography, contrast; supervision and interpretation only	9.6
	70374	complete procedure	24.0

WAC 296-23-015 Head and neck.

Unit
Value

(70002, 70003 have been deleted. To report, use 76499)

70010 Myelography, posterior fossa supervision and interpretation only

BR

70011 complete procedure

BR

(For injection procedure, see 61052)

70015 Cisternography, positive contrast; supervision and interpretation only

BR

70016 complete procedure

BR

(For injection procedure only for cisternography, see 61053)

(70020, 70021 have been deleted. To report, use 76499)

	Unit Value	WAC 296-23-020	Chest.	Unit Value
			(71000 Chest minifilm has been deleted)	
(For injection procedure only for laryngography, see 31708)				
70380 Radiologic examination, salivary gland for calculus	6.4	71010	radiologic examination, chest, single view, frontal	4.0
70390 Sialography supervision and interpretation only	3.2	71015	stereo, frontal	5.0
70391 complete procedure	8.0	71020	radiologic examination, chest, two views, frontal and lateral;	7.0
(For injection procedure only for sialography, see 42550)		71021	with apical lordotic procedure	7.2
70400 Orbitography, air or positive contrast; supervision and interpretation only	BR	71022	with oblique projections	7.2
70401 complete procedure	BR	71023	with fluoroscopy	
(For injection procedure only for orbitography, see 67510)		71030	radiologic examination, chest, complete, minimum of four views;	8.0
70450 Computerized axial tomography, head or brain; without contrast material	58.0	71034	with fluoroscopy	10.0
70460 with contrast material	64.0		(For separate chest fluoroscopy, see 76000)	
70470 without intravenous contrast material, followed by contrast materials and further sections	71.0	71035	Radiologic examination, chest, special views, e.g., lateral decubitus, Bucky studies	BR
(For coronal, sagittal, and/or oblique sections, see 76375)		71036	Fluoroscopic localization for needle biopsy of intrathoracic lesion, including follow-up films	BR
70480 Computerized axial tomography, orbit, sella, or posterior fossa or outer, middle, or inner ear; without contrast material	58.0	71038	Fluoroscopic localization for transbronchial biopsy or brushing	BR
70481 with contrast material	64.0		(For biopsy procedure, see 32420)	
70482 without contrast material, followed by contrast material and further sections	71.0	71040	Bronchography, unilateral; supervision and interpretation only	5.6
(For coronal, sagittal, and/or oblique sections, see 76375)		71041	complete procedure	14.0
70486 Computerized axial tomography, maxillofacial area; without contrast material	58.0	71060	bronchography, bilateral; supervision and interpretation only	8.8
70487 with contrast material(s)	64.0	71061	complete procedure	22.0
70488 without contrast material, followed by contrast material(s) and further sections	71.0		(For injection procedure only for bronchography, see 31715, 31710)	
(For coronal, sagittal, and/or oblique sections, see 76375)		71090	Insertion pacemaker, fluoroscopy and radiography, supervision and interpretation only	BR
70490 Computerized axial tomography, soft issue neck; without contrast material	BR	71100	Ribs, unilateral, minimum of two views	7.2
70491 with contrast material(s)	BR	71101	including posteroanterior chest; minimum of three views	11.2
70492 without contrast material followed by contrast material(s) and further sections	BR	71110	bilateral, minimum of three views	10.0
(For coronal, sagittal, and/or oblique sections, see 76375)		71111	including posteroanterior chest, minimum of four views	14.0
(For cervical spine, see 72125, 72126)		71120	Sternum, minimum of two views	6.0
70540 Magnetic resonance (e.g., proton) imaging; orbit, face and neck	120.0	71130	Sternoclavicular joint(s), minimum of three views	6.0
70551 Magnetic resonance imaging (e.g., proton) imaging, brain (including brain stem)	120.0	71250	Computerized tomography, thorax; without contrast material	77.0
		71260	with contrast material(s)	84.0
		71270	without contrast material, followed by contrast material and further sections	90.0
			(For coronal, sagittal, and/or oblique sections, see 76375)	
		71550	Magnetic resonance (e.g., proton) imaging, chest (e.g., for evaluation of hilar and mediastinal lymphadenopathy)	120.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-015, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-015, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-23-015, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-015, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-015, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-23-015, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-23-061 (codified as WAC 296-23-015), filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-015, filed 1/30/74; Order 68-7, § 296-23-015, filed 11/27/68, effective 1/1/69.]

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-020, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-020, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-23-020, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-020, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-020, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-23-020, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-23-064 (codified as WAC 296-23-020), filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-020, filed 1/30/74; Order 68-7, § 296-23-020, filed 11/27/68, effective 1/1/69.]

WAC 296-23-025 Spine and pelvis.

	Unit Value		Unit Value
		(For pelvimetry, see 74710)	
72010 Spine, entire, survey study (A-P & lateral)	16.0	72200 Sacro-iliac joints, less than three views	5.0
72020 Radiologic examination, spine, single view, specify level	6.5	72202 complete, minimum of three views	8.0
72040 cervical, A-P and lateral	6.0	72220 Sacrum and coccyx, minimum of two views	6.4
72050 complete, minimum of four views	10.0	72240 Myelography, cervical supervision and interpretation only	7.2
72052 including oblique and flexion and extension views	15.2	72241 complete procedure	18.0
72070 thoracic, A-P and lateral	9.0	72255 thoracic supervision and interpretation only	7.2
72072 thoracic, A-P and lateral, including swimmer's view of the cervicothoracic junction	12.0	72256 complete procedure	18.0
72074 thoracic, complete inc. obliques, minimum of four views	16.0	72265 lumbosacral supervision and interpretation only	7.2
72080 thoraco-lumbar, A-P and lateral	9.0	72266 complete procedure	18.0
72090 scoliosis study, including supine and erect studies	6.0	72270 entire spinal canal supervision and interpretation only	12.0
72100 lumbo-sacral, A-P and lateral	9.0	72271 complete procedure	30.0
72110 lumbosacral, complete, with oblique views	16.0	(For injection procedures for myelography, see 62284)	
72114 including bending views	18.5	72285 Diskography, cervical supervision and interpretation only	8.0
72120 bending views only, minimum of four views	10.0	72286 complete procedure	20.0
72125 Computerized axial tomography, cervical spine; without contrast material	62.4	72295 lumbar supervision and interpretation only	8.0
72126 with contrast material	72.8	72296 complete procedure	20.0
72127 without contrast material, followed by contrast material(s) and further sections		(For injection procedures for diskography, see 62290, 62291)	
(For injection procedure 72127, 72129, 72130, 72133, see 62284)		BR	
72128 Computerized axial tomography, thoracic spine; without contrast material	62.4	[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-025, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-025, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-23-025, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-025, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-025, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-23-025, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-23-067 (codified as WAC 296-23-025), filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-025, filed 1/30/74; Order 68-7, § 296-23-025, filed 11/27/68, effective 1/1/69.]	
72129 with contrast material	72.8		
72130 without contrast material, followed by contrast material(s) and further sections		BR	
72131 Computerized axial tomography, lumbar spine; without contrast material	60.0		
72132 with contrast material	70.0		
(For coronal, sagittal, and/or oblique sections, see 76375)			
72133 without contrast material, followed by contrast material(s) and further sections		BR	
(72140 has been deleted. To report, see 72141-72144)			
72141 Magnetic resonance (e.g., proton) imaging, spinal canal and contents (two sequences or standard examination); cervical	120.0	73000 Clavicle	4.8
72143 thoracic	120.0	73010 Scapula	6.0
72144 lumbar	120.0	73020 Shoulder, limited, one view	4.0
(72145 has been deleted. To report, see 72125-72132)		73030 complete, minimum of two views	6.0
72170 Pelvis, A-P only	5.0	73040 arthrography supervision and interpretation only	4.0
72180 stereo	6.4	73041 complete procedure	10.0
72190 complete, minimum of three views	8.0	(For injection procedure for arthrography, see 23350)	
(For pelvimetry, see 74710)			
72192 Computerized tomography, pelvis; without contrast material		73050 Acromio-clavicular joints, bilateral, with or without weighted distraction	7.0
72193 with contrast material(s)		73060 Humerus, minimum of two views	4.8
72194 without contrast material, followed by contrast material(s) and further sections		73070 Elbow, limited, A-P and lateral	4.8
		73080 complete, minimum of three views	6.0
		73085 Radiologic examination, elbow, arthrography; supervision and interpretation only	4.0
		73086 complete procedure	10.0
		(For injection procedure only for arthrography, see 24220)	
		73090 Forearm, including one joint, A-P and lateral	4.8
		73100 Wrist, limited, A-P and lateral	4.0
		73110 complete, minimum of three views	6.0

WAC 296-23-030 Upper extremities.

	Unit Value
73115 Radiologic examination, wrist, arthrography; supervision and interpretation only	4.0
73116 complete procedure	10.0
(For injection procedure only for arthrography, see 25246)	
73120 Hand, limited, minimum of two views	4.0
73130 complete, minimum of three views	6.0
73140 Finger(s), minimum of two views	3.6
73200 Computerized tomography, upper extremity; without contrast material	58.0
73201 with contrast material(s)	64.0
73202 without contrast material, followed by contrast material(s) and further sections	71.0
(For coronal, sagittal and oblique sections, see 76375)	
73220 Magnetic resonance (e.g., proton) imaging, upper extremity	120.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-030, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-030, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-030, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-030, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-23-030, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-23-071 (codified as WAC 296-23-030), filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-030, filed 1/30/74; Order 68-7, § 296-23-030, filed 11/27/68, effective 1/1/69.]

WAC 296-23-035 Lower extremities.

	Unit Value
73500 Radiologic examination, hip, unilateral, one view	5.0
73510 complete, minimum of two views	7.0
73520 Radiologic examination, hips, bilateral, complete minimum of two views of each hip (including A-P of pelvis)	9.6
73525 Radiologic examination, hip, arthrography; supervision and interpretation only	BR
73526 complete procedure	BR
(For injection procedure only for arthrography, see 27093, 27094)	
73530 Radiologic examination, hip, during operative procedure	16.0
73550 Radiologic examination, femur (thigh), A-P and lateral	6.0
73560 Radiologic examination, knee, A-P and lateral	4.4
73562 A-P and lateral, with oblique(s), minimum three views	6.4
73564 complete, including obliques, and/or tunnel, and/or patella and/or standing views	8.4
73580 Radiologic examination, knee, arthrography supervision and interpretation only	6.4
73581 complete procedure	16.0
(For injection procedure for arthrography, see 27370)	
73590 Radiologic examination, tibia and fibula (leg), including one joint, A-P and lateral	4.8
73592 lower extremity, infant, minimum of	

two views	4.0
73600 Radiologic examination, ankle, limited, A-P and lateral	4.4
73610 complete, minimum of three views	6.0
73615 Radiologic examination, ankle, arthrography; supervision and interpretation only	4.0
73616 complete procedure	10.0
(For injection procedure only for arthrography, see 27648)	
73620 Radiologic examination, foot, limited, A-P and lateral	4.0
73630 complete, minimum of three views	5.6
73650 Radiologic examination, calcaneus, minimum of two views	4.4
73660 Toe(s), minimum of two views	3.6
73700 Computerized tomography, lower extremity; without contrast material	58.0
73701 with contrast material(s)	64.0
73702 without contrast material, followed by contrast materials and further sections	71.0
(For coronal, sagittal and/or oblique sections, see 76375)	
73720 Magnetic resonance (e.g., proton) imaging, lower extremity	120.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-035, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-035, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-23-035, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-035, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-035, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-23-035, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-23-074 (codified as WAC 296-23-035), filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-035, filed 1/30/74; Order 68-7, § 296-23-035, filed 11/27/68, effective 1/1/69.]

WAC 296-23-040 Abdomen.

	Unit Value
74000 Abdomen, single view (KUB) A-P	6.0
74010 with additional oblique or cone view ..	8.0
74020 complete, includes ducubitus and/or erect views	11.0
74022 complete acute abdomen series, including supine, erect, and/or decubitus views, upright PA chest	BR
74150 Computerized tomography, abdomen; without contrast material	77.0
74160 with contrast material	84.0
74170 without contrast material, followed by contrast material and further sections .	90.0
(For coronal, sagittal and/or oblique sections, see 76375)	
74181 Magnetic resonance (e.g., proton) imaging, abdomen	120.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-040, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-040, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-23-040, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-040, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-040, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-23-040, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-23-077 (codified as WAC 296-23-040), filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-040, filed 1/30/74; Order 68-7, § 296-23-040, filed 11/27/68, effective 1/1/69.]

WAC 296-23-045 Gastrointestinal tract.

	Unit Value
74210 Pharynx and/or cervical esophagus	8.8
74220 Esophagus	8.8
74230 Swallowing function, pharynx and/or esophagus, by cineradiography and/or video.	12.0
74235 Removal of foreign body(s), esophageal, with use of balloon catheter under fluoroscopic guidance	BR
74240 Uppergastrointestinal tract, with or without delayed films, without KUB.	14.0
74241 with KUB	15.2
74245 with small bowel, includes multiple serial films.	17.6
74246 Radiological exam gastrointestinal tract, upper, air contrast, with specific high density barium, effervescent agent, with or without glucagon, with or without delayed films; without KUB	BR
74247 with KUB	BR
74249 with small bowel follow through	BR
74250 Small bowel, includes multiple serial films.	14.0
74260 Duodenography, hypotonic	BR
74270 Colon, barium enema	12.0
74280 Air contrast with specific high density barium with or without glucagon	14.0
74290 Cholecystography, oral contrast	9.6
74291 repeat examination, same study or multiple exam	4.8
74300 Cholangiography and/or pancreatography; during surgery	10.0
74301 additional set during surgery	3.0
74305 postoperative	12.0
(For biliary duct stone extraction, percutaneous, see 47630; via basket catheter, see 74327)	
74310 intravenous	16.0
74315 oral	12.0
74320 percutaneous, transhepatic supervision and interpretation only	6.4
74321 complete procedure	16.0
(For injection procedure for percutaneous or transhepatic cholangiography, see 47500)	
(74325, 74326 have been deleted. To report use 76499)	
74327 Postoperative biliary duct stone removal, fluoroscopic monitoring and radiography	BR
74328 Endoscopic catheterization of the biliary ductal system, fluoroscopic monitoring and radiography	BR
74329 Endoscopic catheterization of the pancreatic ductal system, fluoroscopic monitoring and radiography.	BR
74330 Combined endoscopic catheterization of the biliary and pancreatic ductal systems, fluoroscopic monitoring and radiography	BR
(74331 has been deleted. For endoscopic sphincterotomy, use 43262)	
74340 Introduction of long gastrointestinal tube (e.g., Miller-Abbott), with multiple fluoroscopies and films	BR
74350 Percutaneous placement of gastrostomy tube; radiological guidance only	BR
74351 complete procedure	BR
(For endoscopic approach, use 43246)	

74355 Percutaneous placement of enteroclysis tube; radiologic guidance only	BR
74356 complete procedure	BR
(For surgical procedure only, use 44015)	
74360 Intraluminal dilation of strictures and/or obstructions (e.g., esophagus or biliary tree); radiologic guidance only	BR
74361 complete procedure	BR
(For dilation only, use 43455 or 47555)	
[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-045, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-045, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-23-045, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-045, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-045, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-23-045, filed 11/24/76, effective 1/1/77; Order 74-7, § 296-23-045, filed 1/30/74; Order 68-7, § 296-23-045, filed 11/27/68, effective 1/1/69.]	

WAC 296-23-050 Urinary tract.

	Unit Value
(For kidney, ureter and bladder, see 74000-74020)	
74400 Urography, (pyelography) intravenous, with or without KUB	15.2
74405 with special hypertensive contrast concentration and/or clearance studies	16.0
74410 Urography, infusion, drip technique and/or bolus technique;	20.0
74415 with nephrotomography	26.0
74420 Urography retrograde, with or without KUB	12.0
74425 Urography, antegrade, (pyelostogram, nephrostogram, loopogram); supervision and interpretation only	BR
74426 complete procedure	BR
(For injection procedure only, see 50394, 50684, 50690)	
74430 Cystography, minimum of three views, supervision and interpretation only	3.5
74431 Cystography, complete procedure	8.8
(For injection procedure for cystography, see 51600, 51605)	
74440 Vasography, vesiculography, or epididymography supervision and interpretation only	3.5
74441 complete procedure	8.8
(For injection procedure, see 52010, 52110, 55300)	
74445 Corpora cavernosography; supervision and interpretation only	BR
74446 complete procedure	BR
(For injection procedure only, see 54230)	
74450 Urethrocystography, retrograde	3.8
74451 complete procedure	9.6
74455 voiding	5.6
74456 complete procedure	14.0
(For injection procedure only for voiding urethrocystography, see 51600)	

	Unit Value	WAC 296-23-065 Vascular system.	Unit Value
		(For vascular injection procedures, see 36000-36299)	
		(For cardiac fluoroscopy, see 93280)	
		(For cardiac catheterization, see 93501-93599)	
(74460, 74461 have been deleted. To report use 76499)		When multiple vascular radiographic procedures are performed at the same time (e.g., aortic arch study plus renal arteriogram), the total value shall be the value for the major procedure plus 50% of the value for the lesser procedure(s) unless otherwise indicated. See modifier -5. The cost of catheters, drugs and contrast media is included in the listed value for the radiographic procedure.	
74470 Translumbar renal cyst study, translumbar, contrast visualization; supervision and interpretation only	4.0		
74471 complete procedure	10.0		
(For injection procedure only for translumbar renal cyst study, see 50390)			
74475 Introduction of intracatheter or catheter into renal pelvis for drainage and/or injection, percutaneous, with fluoroscopic monitoring and radiography; supervision and interpretation only			
74476 complete procedure	BR BR	HEART	
(For injection procedure only, see 50392)		75500 Angiocardiography, by cineradiography supervision and interpretation only	8.8
74480 Introduction of ureteral catheter or stent into ureter through renal pelvis for drainage and/or injection, percutaneous, with fluoroscopic monitoring and radiography; supervision and interpretation only		75501 complete procedure (including catheterization)	22.0
74481 complete procedure	BR BR	75505 Angiocardiography by serialography (single plane); supervision and interpretation only	9.2
(For injection procedure only, see 50392 - 50398)		75506 complete procedure (including catheterization)	23.0
74485 Dilation of nephrostomy or ureters with fluoroscopic monitoring and radiography; supervision and interpretation only		75507 Angiocardiography by serialography, multi-plane; supervision and interpretation only	18.4
74486 complete procedure	BR BR	75509 complete procedure (including catheterization)	46.0
[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-050, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-050, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-23-050, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-050, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-23-050, filed 11/24/76, effective 1/1/77; Order 74-7, § 296-23-050, filed 1/30/74; Order 68-7, § 296-23-050, filed 11/27/68, effective 1/1/69.]		(75510, 75511 CO2 or positive contrast angiocardiography have been deleted. To report, use 76499.)	
		75519 Cardiac radiography, selective cardiac catheterization; right side, supervision and interpretation only	17.2
		75520 complete procedure	43.0
		75523 left side, supervision and interpretation only	8.6
		75524 left side, complete procedure	21.5
		75528 Cardiac radiography, selective cardiac catheterization, right and left side, complete procedure	55.0
		75552 Magnetic resonance (e.g., proton) imaging, myocardium	120.0
WAC 296-23-055 Female genital tract.		AORTA AND ARTERIES	
		(For injection procedure only, see 36100-36299)	
		(For digital radiology, use modifier -25, page 290)	
(For abdomen and pelvis, see 74000-74170, 72170-72190)		Aortography	
74710 Pelvimetry with or without placental localization	10.0	75600 thoracic or abdominal, without serialography supervision and interpretation only	8.0
74720 Abdomen for fetal age, fetal position and/or placental localization, single view	4.0	75601 complete procedure	20.0
74725 multiple views	6.0	75605 by serialography supervision and interpretation only	11.0
74740 Hysterosalpingography supervision and interpretation only	4.3	75606 complete procedure	30.0
74741 complete procedure	10.8	75620 Abdominal, including lower extremities, without serialography	32.0
(For injection procedure for hysterosalpingography, see 58340)		75622 Abdominal, catheter, without serialography	32.0
74775 Perineogram (e.g., vaginogram, for sex determination or extent of anomalies)		75625 Aortography, abdominal, translumbar, by serialography; supervision and interpretation only	15.2
[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-055, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-055, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-055, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-23-055, filed 11/24/76, effective 1/1/77; Order 74-7, § 296-23-055, filed 1/30/74; Order 68-7, § 296-23-055, filed 11/27/68, effective 1/1/69.]		75626 complete procedure	40.0
		75627 Aortography, abdominal, catheter, by serialography; supervision and interpretation only	17.0

	Unit Value		Unit Value
75628	complete procedure	48.0	
75630	Aortography, abdominal plus bilateral ileofemoral lower extremity, catheter, by serialography; supervision and interpretation only		
	complete procedure	BR	
75631	complete procedure	BR	
75650	Angiography, cervicocerebral, catheter, including vessel origin; supervision and interpretation only	17.2	
75651	complete procedure	40.0	
75652	Angiography, cervicocerebral, selective catheter, including vessel origin; one vessel, supervision and interpretation only	12.6	
75653	one vessel, complete procedure	36.0	
75654	two vessels, supervision and interpretation only	13.3	
75655	two vessels, complete procedure	38.0	
75656	three or four vessels, supervision and interpretation only	17.2	
75657	three or four vessels, complete procedure	40.0	
75658	Angiography, brachial, retrograde; supervision and interpretation only	17.2	
75659	complete procedure	40.0	
75660	Angiography, external carotid, cerebral, unilateral, selective; supervision and interpretation only	17.2	
75661	complete procedure	40.0	
75662	Angiography, external carotid, cerebral, bilateral, selective; supervision and interpretation only	21.5	
75663	complete procedure	50.0	
75665	Angiography, carotid, cerebral, unilateral; supervision and interpretation only	17.2	
75667	direct puncture, complete procedure	40.0	
75669	catheter, complete procedure	46.0	
75671	Angiography, carotid, cerebral, bilateral; supervision and interpretation only	21.5	
75672	direct puncture, complete procedure	50.0	
75673	catheter, complete procedure	54.0	
75676	Angiography, carotid, cervical, unilateral; supervision and interpretation only	17.2	
75677	direct puncture, complete procedure	40.0	
75678	catheter, complete procedure	46.0	
75680	Angiography, carotid, cervical, bilateral; supervision and interpretation only	21.5	
75681	direct puncture, complete procedure	50.0	
75682	catheter, complete procedure	54.0	
75685	Angiography, vertebral; supervision and interpretation only	17.2	
75686	direct puncture, complete procedure	40.0	
75687	catheter, complete procedure	46.0	
75690	Angiography, vertebral, cervical, unilateral; supervision and interpretation only	17.2	
75691	direct puncture, complete procedure	40.0	
75692	catheter, complete procedure	46.0	
75695	Angiography, vertebral, cervical, bilateral; supervision and interpretation only	21.5	
75696	direct puncture, complete procedure	50.0	
75697	catheter, complete procedure	54.0	
75705	Angiography, spinal, selective; supervision and interpretation only	9.8	
75706	complete procedure	28.0	
75710	Angiography, extremity, unilateral, supervision and interpretation only	10.5	
75711	without serialography, complete procedure	30.0	
75712	by serialography, complete procedure	32.0	
75716	Angiography, extremity, bilateral; supervision and interpretation only	11.2	
75717	without serialography, complete procedure	32.0	
75718	by serialography, complete procedure	34.0	
75722	Angiography, renal, unilateral, selective (including flush aortogram); supervision and interpretation only		17.2
	complete procedure		40.0
75723	complete procedure		
75724	Angiography, renal, bilateral, selective (including flush aortogram); supervision and interpretation only		25.8
	complete procedure		60.0
75725	complete procedure		
75726	Angiography, visceral; selective or supraseductive, supervision and interpretation only		19.7
75727	selective (with or without flush aortogram), complete procedure		46.0
75728	supraseductive, complete procedure		48.0
	(For selective angiography, additional visceral vessels studied after basic examination, see 75772, 75773)		
75731	Angiography, adrenal, unilateral, selective; supervision and interpretation only		19.7
75732	complete procedure		46.0
75733	Angiography, adrenal, bilateral, selective; supervision and interpretation only		20.6
75734	complete procedure		48.0
75736	Angiography, pelvic; selective or supraseductive, supervision and interpretation only		18.9
75737	selective, complete procedure		44.0
75738	supraseductive, complete procedure		46.0
75741	Angiography, pulmonary, unilateral, selective; supervision and interpretation only		10.5
75742	complete procedure		30.0
75743	Angiography, pulmonary, bilateral, selective; supervision and interpretation only		21.5
75744	complete procedure		50.0
75746	Angiography, pulmonary; by nonselective catheter or venous injection, supervision and interpretation only		10.5
75747	catheter, nonselective, complete procedure		30.0
75748	venous injection, complete procedure		40.0
75750	Angiography, coronary, root injection; supervision and interpretation only		25.8
75751	complete procedure		60.0
75752	Angiography, coronary, unilateral selective injection, including left ventricular and supravalvular angiogram and pressure recording; supervision and interpretation only		30.1
75753	complete procedure		70.0
75754	Angiography, coronary, bilateral selective injection, including left ventricular and supravalvular angiogram and pressure recording; supervision and interpretation only		34.4
75755	complete procedure		80.0
75756	Angiography, internal mammary; supervision and interpretation only		15.2
75757	complete procedure		40.0
75762	Angiography, coronary bypass, unilateral selective injection; supervision and interpretation only		BR
75764	complete procedure		BR
75766	Angiography, coronary bypass, multiple selective injection; supervision and interpretation only		BR
75767	complete procedure		BR
75774	Angiography, coronary bypass, selective, each additional vessel studied after basic examination; supervision and interpretation only		BR
75775	complete procedure		BR

	Unit Value		Unit Value
(75772, 75773 have been deleted. To report, see 75774 - 75775)			
75790 Angiography, arteriovenous shunt (e.g., dialysis patient)	BR	75872 puncture	32.0
VEINS AND LYMPHATICS		75873 Venography, epidural; supervision and interpretation only	BR
(For injection procedure only for venous system, see 36400-36510)		75880 complete procedure	BR
(For injection procedure only for lymphatic system, see 38790-38794)		75881 Venography, orbital; supervision and interpretation only	13.7
75801 Lymphangiography, extremity only, unilateral; supervision and interpretation only	9.6	75885 complete procedure	36.0
75802 complete procedure	25.0	75886 Percutaneous transhepatic portography with hemodynamic evaluation; supervision and interpretation only	13.7
75803 Lymphangiography, extremity only, bilateral; supervision and interpretation only	12.0	75887 complete procedure	36.0
75804 complete procedure	35.0	75888 Percutaneous transhepatic portography without hemodynamic evaluation; supervision and interpretation only	12.9
75805 Lymphangiography, pelvic/abdominal, unilateral; supervision and interpretation only	12.0	75889 complete procedure	34.0
75806 complete procedure	35.0	75889 Hepatic venography wedged or free, with hemodynamic evaluation; supervision and interpretation only	14.4
75807 Lymphangiography, pelvic/abdominal, bilateral; supervision and interpretation only	12.0	75890 complete procedure	38.0
75808 complete procedure	35.0	75891 Hepatic venography, wedged or free, without hemodynamic evaluation; supervision and interpretation only	12.9
75810 Splenoportography; supervision and interpretation only	15.2	75892 complete procedure	34.0
75811 complete procedure	40.0	75893 Venous sampling thru catheter without angiography (e.g., for parathyroid hormone, renin)	5.0
(For injection procedure for splenoportography, see 38200)		TRANSCATHETER THERAPY AND BIOPSY	
75820 Venography, extremity, unilateral supervision and interpretation only	8.0	75894 Transcatheter therapy, embolization, including angiography; supervision and interpretation only	15.2
75821 complete procedure	16.0	75895 complete procedure	40.0
75822 Venography, extremity, bilateral; supervision and interpretation only	10.0	75896 Transcatheter therapy, infusion, including angiography; supervision and interpretation only	15.9
75823 complete procedure	26.0	75897 complete procedure	42.0
75825 caval, inferior or superior, with serialography	16.0	75898 Angiogram through existing catheter for follow-up study for transcatheter therapy, embolization or infusion	10.0
75826 complete procedure	32.0	75940 Percutaneous placement of IVC filter; supervision and interpretation only	BR
75827 Venography, caval, superior, with serialography; supervision and interpretation only	12.0	75941 complete procedure	BR
75828 complete procedure	35.0	(For surgical procedure, use 37620)	
75831 Venography, renal, unilateral, selective; supervision and interpretation only	15.2	75950 Transcatheter intravascular occlusion, temporary, including angiography; supervision and interpretation only	BR
75832 complete procedure	40.0	75951 complete procedure	BR
75833 Venography, renal, bilateral, selective; supervision and interpretation only	19.5	75955 Transcatheter intravascular occlusion, permanent, including angiography; supervision and interpretation only	BR
75834 complete procedure	45.0	75956 complete procedure	BR
75840 Venography, adrenal, unilateral, selective; supervision and interpretation only	10.8	75961 Transcatheter retrieval, percutaneous, of fractured venous or arterial catheter	BR
75841 complete procedure	30.0	75962 Percutaneous transluminal angioplasty, peripheral artery; supervision and interpretation only	BR
75842 Venography, adrenal, bilateral, selective; supervision and interpretation only	12.2	75963 complete procedure	BR
75843 complete procedure	32.0	75964 Percutaneous transluminal angioplasty, each additional peripheral artery; supervision and interpretation only	BR
75845 Venography, azygos; selective or nonselective, supervision and interpretation only	10.6	75965 complete procedure	BR
75846 selective, complete procedure	30.0	75966 Percutaneous transluminal angioplasty, visceral artery; supervision and interpretation only	BR
75847 nonselective, complete procedure	28.0	75967 complete procedure	BR
75850 Venography, intraosseous; supervision and interpretation only	12.2	75968 Percutaneous transluminal angioplasty, each additional visceral artery; supervision and interpretation only	BR
75851 complete procedure	32.0	75969 complete procedure	BR
75860 Venography, sinus or jugular, catheter; supervision and interpretation only	12.2	75970 Transcatheter biopsy; supervision and interpretation only	BR
75861 complete procedure	32.0	75971 complete procedure	BR
75870 Venography, superior sagittal sinus; supervision and interpretation only	12.2		
75871 complete procedure, including direct			

	Unit Value		Unit Value
(For transcatheter renal and ureteral biopsy, see 52007)		76003	Fluoroscopic localization for needle biopsy or aspiration BR
(For percutaneous needle biopsy of pancreas, see 48102; of retroperitoneal lymph node or mass, see 49180)		76020	Bone age studies 6.0
(For injection procedure only for percutaneous transluminal angioplasty, see 36100-36299)		76040	Bone length studies (orthoroentgenogram, scanogram) 10.0
(For percutaneous transluminal coronary angioplasty, see 93570)		76061	Radiological examination, osseous survey; limited (e.g., for metastases) 15.2
75980 Percutaneous transhepatic biliary drainage with monitoring; supervision and interpretation only BR		76062	complete (axial and appendicular skeleton) BR
75981 complete procedure BR		76065	osseous survey, infant 13.2
75982 Percutaneous placement of drainage catheter for combined internal and external biliary drainage or of a drainage stent for internal biliary drainage in patients with an inoperable mechanical biliary obstruction; supervision and interpretation only BR		76066	Joint survey, single view, one or more joints (specify) BR
75983 complete procedure BR		76070	Computerized tomography, bone density study BR
(For injection procedure only for percutaneous biliary drainage, see 47510)		76080	Fistula or sinus tract study supervision and interpretation only 4.8
75984 Change of percutaneous drainage catheter with contrast monitoring (i.e., biliary tract, urinary tract); supervision and interpretation only BR		76081	complete procedure 12.0
75985 complete procedure BR		76086	Mammary ductogram or galactogram, single duct; supervision and interpretation only 6.3
(For injection procedure only for percutaneous biliary drainage, see 47510)		76087	complete procedure 15.8
(For percutaneous nephrostolithotomy or pyelostolithotomy, see 50080, 50081)		76088	Mammary ductogram or galactogram, multiple ducts; supervision and interpretation only 10.6
75990 Drainage of abscess, percutaneous, with radiologic guidance (i.e., fluoroscopy, ultrasound, or computed tomography), with or without placement of indwelling catheter BR		76089	complete procedure 26.5
(75990 is neither organ nor area specific. For drainage of abscess performed without radiology or fluoroscopy, see under specific anatomic site)			(For injection procedure only for mammary ductogram or galactogram, see 19030)
[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-065, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-065, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-23-065, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-065, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-065, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-23-065, filed 11/24/76, effective 1/1/77; Order 74-7, § 296-23-065, filed 1/30/74; Order 68-7, § 296-23-065, filed 11/27/68, effective 1/1/69.]		76090	Mammography, unilateral 8.8
		76091	bilateral 13.2
			(For xeromammography, list 76150 in addition to code for mammography)
		76096	Localization of breast nodule or calcification before operation, with marker and confirmation of its position with appropriate imaging (e.g., ultrasound or radiologic) 14.6
		76097	each additional localization 7.3
		76098	Radiological examination, breast surgical specimen BR
		76100	Laminography (tomography, planigraphy, body section radiography) (independent procedure) 13.2
		76101	Radiologic examination, complex motion (i.e., hypercycloidal) body section (e.g., mastoid polytomography), other than kidney; unilateral 19.3
		76102	bilateral 35.0
			(For nephrotomography, see 74415)
		76105	to complement routine examination ... 7.0
		76120	Cineradiography (independent procedure) 13.2
		76125	to complement routine examination ... 7.0
			(76127 has been deleted. The use of photographic media is not reported separately but is considered to be a component of the basic procedure)
		76140	Written consultation on x-ray examination made elsewhere BR
		76150	Xeroradiography 6.0
			(76300 has been deleted. For thermography of the breast, use 76499)
		76350	Subtraction in conjunction with contrast studies BR
		76355	Computerized tomography guidance for stereotactic localization BR
76000 Fluoroscopy (separate procedure, other than 71023 or 71034) 3.0			

WAC 296-23-079 Miscellaneous.

(For arthrography of shoulder, see 73040, 73041; elbow, see 73085, 73086; wrist, see 73115, 73116; hip, see 73525, 73526; knee, see 73580, 73581; ankle, see 73615, 73616)

76000 Fluoroscopy (separate procedure, other than 71023 or 71034) 3.0

	Unit Value
76360 Computerized tomography guidance for needle biopsy; supervision and interpretation only	BR
76361 complete procedure	BR
76365 Computerized tomography guidance for cyst aspiration; supervision and interpretation only	BR
76366 complete procedure	BR
76370 Computerized tomography guidance for placement of radiation therapy fields . . .	BR
76375 Computerized tomography, coronal, sagittal, multiplanar, and/or oblique reconstruction	23.5
76400 Magnetic resonance (e.g., proton) imaging, bone marrow blood supply	120.0
76499 Unlisted diagnostic radiologic procedure .	BR

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-079, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-079, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-23-079, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-079, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-079, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-23-079, filed 11/24/76, effective 1/1/77; Order 74-7, § 296-23-079, filed 1/30/74.]

WAC 296-23-07902 Head and neck.

	Unit Value
76500 Echoencephalography, A-mode, diencephalic midline,	7.7
(76505 has been deleted. To report complete A-mode echoencephalography, use 76999)	
76506 Echoencephalography, B-mode (gray scale) complete (for determination of ventricular size, delineation of cerebral contents and detection of fluid, masses or other intracranial abnormalities), including A-mode encephalography as secondary component where indicated.	BR
76511 Ophthalmic, ultrasound, echography; spectral analysis with amplitude quantitation, A-mode ..	22.9
76512 contact scan B-mode	22.9
76516 Ophthalmic biometry by ultrasound echography; A-mode	15.4
76519 with intraocular lens power calculation	BR
76529 Ophthalmic ultrasound foreign body locatization .	BR
(76530 has been deleted. To report A-mode echography of thyroid, use 76999)	
76536 Echography, soft tissues of head and neck (e.g., thyroid, parathyroid, parotid) B-scan and/or real time with image documentation	11.4
(76535 has been deleted. To report use 76536)	
(76550, carotid imaging has been deleted. To report, use 93870)	

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-07902, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-07902, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-23-07902, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-07902, filed 12/23/80, effective 3/1/81; Order 75-39, § 296-23-07902, filed 11/28/75, effective 1/1/76.]

WAC 296-23-07903 Heart.

	Unit Value
(76601 has been deleted. To report use 76999)	
76604 Echography, chest B-scan (includes mediastinum) and/or real time with image documentation	11.4
76620 Echocardiography, M-mode, complete	15.4
76625 limited, e.g., follow-up or limited study	7.7
76627 Echocardiography, real-time scan; complete	11.4
76628 limited	9.7
76629 Echocardiography M-mode and real time with image documentation	BR
76632 Doppler echocardiography	
(Procedure 76632 is often performed in combination with M-mode or 2-dimensional echocardiography)	
(For echocardiography as a cardiovascular procedure, see 93300-93320)	
(76640 has been deleted. To report A-mode echography of the breast, use 76999)	

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-07903, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-07903, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-23-07903, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-07903, filed 12/23/80, effective 3/1/81; Order 75-39, § 296-23-07903, filed 11/28/75, effective 1/1/76.]

WAC 296-23-07904 Thorax.

	Unit Value
76645 Echography, breast(s) (unilateral or bilateral), B-scan and/or real time with image documentation	19.2
[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-07904, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-07904, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-07904, filed 12/23/80, effective 3/1/81; Order 75-39, § 296-23-07904, filed 11/28/75, effective 1/1/76.]	

WAC 296-23-07905 Abdomen and retroperitoneum.

	Unit Value
76700 Echography, scan B-mode, abdominal, complete .	22.9
76705 limited, (e.g., single organ, quadrant, follow-up)	15.4
76770 Echography, scan B-mode, retroperitoneal (e.g., renal, aorta, nodes), complete	22.9
76775 limited	19.2
[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-07905, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-07905, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-07905, filed 12/23/80, effective 3/1/81; Order 75-39, § 296-23-07905, filed 11/28/75, effective 1/1/76.]	

WAC 296-23-07906 Obstetrics, gynecology and pelvis.

	Unit Value
76805 Echography, pregnant uterus pelvic B-scan and/or real time with image documentation; complete	21.2
76815 fetal growth rate only	9.7
76816 follow-up or repeat (e.g., for follicles)	9.7
76855 Echography, pelvic area (Doppler)	11.4
76856 Echography, pelvic, (nonobstetric), B-scan and/or real time with image documentation	BR
76857 limited or follow-up	BR

GENITALIA

76870 Echography, scrotum and contents	BR
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EXTREMITIES

76880 Echography, extremity, B-scan and/or real time with image documentation	BR
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[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-07906, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-07906, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-23-07906, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-07906, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-07906, filed 12/23/80, effective 3/1/81; Order 75-39, § 296-23-07906, filed 11/28/75, effective 1/1/76.]

WAC 296-23-07907 Vascular studies.

	Unit Value
(Doppler peripheral flow studies, 76900-76920 have been deleted. To report, see 93850-93950)	
76925 Peripheral imaging, B-scan, Doppler or real-time scan	BR

ULTRASONIC GUIDANCE PROCEDURES

76930 Ultrasonic guidance for pericardiocentesis; supervision and interpretation	BR
76931 complete procedure	BR
76934 Ultrasonic guidance for thoracentesis; supervision and interpretation only	3.0
76935 complete procedure	5.0
76938 Ultrasonic guidance for cyst (any location,) or renal pelvis aspiration; supervision and interpretation only	1.0
76939 complete procedure	2.0
76942 Ultrasonic guidance for needle biopsy; supervision and interpretation only	4.0
76943 complete procedure	6.0
76944 Ultrasonic guidance for abscess or collection drainage; supervision and interpretation only	BR
76945 complete procedure	BR
76946 Ultrasonic guidance for amniocentesis; supervision and interpretation only	4.0
76947 complete procedure	6.0
76950 Echography for placement of radiation therapy fields, B-scan	17.1
76960 Ultrasonic guidance for placement of radiation therapy fields except for B-scan echography	14.3

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-07907, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-07907, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-23-07907, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-07907, filed 12/23/80, effective 3/1/81; Order 75-39, § 296-23-07907, filed 11/28/75, effective 1/1/76.]

WAC 296-23-07908 Miscellaneous.

	Unit Value
76970 Ultrasound study follow-up specify	10.0
76986 Echography, intraoperative	5.7
76991 Intraluminal ultrasound study (e.g., transrectal, transvesical)	BR
76999 Unlisted ultrasound examination (see guidelines)	BR

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-07908, filed 7/23/87. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-07908, filed 12/23/80, effective 3/1/81; Order 75-39, § 296-23-07908, filed 11/28/75, effective 1/1/76.]

THERAPEUTIC RADIOLOGY

WAC 296-23-080 Radiotherapy—General information and instructions. (1) Radiation therapy as listed in this section provides for teletherapy and brachytherapy to include initial consultation, clinical treatment planning, simulation, medical radiation physics, dosimetry, treatment devices, special services, and clinical treatment management procedures. They include normal follow-up care during course of treatment and for three months following its completion.

CONSULTATION: CLINICAL MANAGEMENT

Preliminary consultation, evaluation of patient prior to decision to treat, or full medical care (in addition to treatment management) when provided by the therapeutic radiologist may be identified by the appropriate procedure codes from medicine or surgery sections.

TREATMENT PLANNING PROCESS (EXTERNAL AND INTERNAL SOURCES)

(Procedures 77260, 77265, 77270, 77275 have been deleted. To report, use 77261-77263)

CLINICAL TREATMENT PLANNING (EXTERNAL AND INTERNAL SOURCES)

The clinical treatment planning process is a complex service including interpretation of special testing, tumor localization, treatment volume determination, treatment time/dosage determination, choice of treatment modality, determination of number and size of treatment ports, selection of appropriate treatment devices, and other procedures.

DEFINITIONS: Simple—planning requiring single treatment area of interest encompassed in a single port or simple parallel opposed ports with minimal blocking.

Intermediate—planning requiring three or more converging ports, two separate treatment areas, special blocking standard wedges, or special time dose constraints.

Complex—planning requiring highly complex blocking, tangential ports, special wedges or compensators, three or more separate treatment areas, special beam considerations.

	Unit Value		Unit Value
77261 Therapeutic radiology treatment planning; simple	BR		
77262 intermediate	BR		
77263 complex	BR		
77280 Therapeutic radiology simulation-aided field setting; (requiring simulator, with or without fluoroscopy); simple	BR	77400 Daily megavoltage treatment management; simple	2.0
77285 intermediate	BR	77405 intermediate	3.0
77290 complex	BR	77410 complex	4.0
77299 Unlisted procedure, therapeutic radiology clinical treatment planning	BR	77415 Therapeutic radiology treatment port film interpretation and verification, per treatment course	3.0
MEDICAL RADIATION PHYSICS, DOSIMETRY, TREATMENT DEVICES AND SPECIAL SERVICES		77420 Weekly megavoltage treatment management; simple	4.0
77300 Basic radiation dosimetry calculation, central axis depth dose, TDF, NSD, gap calculation, off axis factor, tissue inhomogeneity factors, as required during course of treatment	4.0	77425 intermediate	5.0
77305 Teletherapy, isodose plan (whether hand or computer calculated); simple (one or two parallel opposed unmodified ports directed to a single area of interest)	3.0	77430 complex	6.0
77310 intermediate (three or more treatment ports directed to a single area of interest)	4.0	(Procedures 77435-77460 have been deleted. To report, use 77400-77499 as appropriate)	
77315 complex (mantle or inverted Y, tangential ports, the use of wedges, compensators, complex rotational blocking or special beam considerations)	6.0	(For complicated shielding devices, see treatment aids, 77600-77635)	
(Procedures 77320, 77325, 77330, 77335, 77340 have been deleted. To report, use 77300-77399 as appropriate)		77465 Daily kilovoltage treatment management	2.0
77321 Special teletherapy port plan, particles, hemi-body, total body	BR	77470 Special treatment procedure (e.g., total body irradiation, hemi-body irradiation, per oral, vaginal cone irradiation)	BR
77326 Brachytherapy isodose calculation; simple (calculation made from single plane, one to four source/ribbon application)	BR	(77470 assumes that the procedure be performed one or more times during the course of therapy, in addition to daily or weekly patient management)	
(For definition of source/ribbon, see page 316B)		77499 Unlisted procedure, therapeutic radiology clinical treatment management	BR
77327 intermediate (multiplane dosage calculations, application involving five to ten sources/ribbons)	BR	HYPERTHERMIA	
77328 complex (multiplane isodose plan, volume implant calculations, over ten sources/ribbons used, special spatial reconstruction)	BR	Hyperthermia treatments as listed in this section include external (superficial and deep) and interstitial. Radiation therapy when given concurrently is listed separately.	
77331 Special dosimetry (e.g., TLD, microdosimetry) (specify)	BR	Hyperthermia is used only as an adjunct to radiation therapy or chemotherapy. It may be induced by a variety of sources, e.g., microwave, ultrasound, low energy radiofrequency conduction, or by probes.	
77332 Treatment devices, design and construction; simple (simple block, simple bolus)	BR	The listed treatments include management during the course of therapy and follow-up care for three months after completion. Preliminary consultation is not included (see medicine 90600-90630). Physics planning and interstitial insertion of temperature sensors, and use of external or interstitial heat generating sources are included.	
77333 intermediate (multiple blocks, stents, bite blocks, special bolus)	BR	77600 Hyperthermia, externally generated; superficial (i.e., heating to a depth of 4 cm or less)	BR
77334 complex (irregular blocks, special shields, compensators, wedges, molds or casts)	BR	77605 deep (i.e., heating to depths greater than 4 cm)	BR
77336 Continuing medical radiation physics consultation in support of therapeutic radiologist, including continuing quality assurance	BR	77610 Hyperthermia generated by interstitial probe(s); 5 or fewer interstitial applicators	BR
(Procedures 77345-77360 have been deleted. To report, use 77300-77399 as appropriate)		77615 more than 5 interstitial applicators	BR
77370 Special medical radiation physics consultation	BR	CLINICAL BRACHYTHERAPY	
77399 Unlisted procedure, medical radiation physics, dosimetry and treatment devices	BR	Clinical brachytherapy requires the use of either natural or man-made radioelements applied into or around a treatment field of interest. The supervision of radioelements and dose interpretation are performed solely by the the therapeutic radiologist. When a procedure requires the service of a surgeon in addition, the modifier '-66' or '-80' may be used (see modifiers in radiology guidelines, page 290). Services 77750-77799 include admission to the hospital and daily visits.	

CLINICAL TREATMENT MANAGEMENT

Except where specified, assumes treatment on a daily basis (4 or 5 fractions per week) with the use of megavoltage photon or high energy particle sources. Daily and weekly clinical treatment management are mutually exclusive for the same dates.

DEFINITIONS: Simple—single treatment area, single port or parallel opposed ports, simple blocks.

Intermediate—two separate treatment areas, three or more ports on a single treatment area, use of special blocks.

DEFINITIONS: (Sources refer to intracavitary placement or permanent interstitial placement; ribbons refer to temporary interstitial placement)

Simple—application with one to four sources/ribbons

Intermediate—application with five to ten sources/ribbons

Complex—application with greater than ten sources/ribbons

(Procedures 77600-77699 have been deleted. To report, use 77332-77334 or 77399 as appropriate)

	Unit Value
(Procedures 77700-77749 have been deleted. To report, use 77300-77399 as appropriate)	
(Professional service component only)	
77750 Infusion or instillation of radioelement solution of radioactive materials for therapy (includes handling and loading)	12.5
(Procedures 77755-77785 have been deleted. To report, use 77761-77799 as appropriate)	
77761 Intracavitary radioelement application; simple ...	BR
77762 intermediate	BR
77763 complex	BR
77776 Interstitial radioelement application; simple	BR
77777 intermediate	BR
77778 complex	BR
77789 Surface application of radioelement	24.75
77790 Supervision, handling, loading of radioelement ...	33.5
77799 Unlisted procedure, clinical brachytherapy	BR

(Procedure 77800 has been deleted. To report, use 77331)

(Procedures 77805-77810 have been deleted. To report, use 77305-77321 or 77326-77328 as appropriate)

(Procedure 77850 has been deleted. To report, use 77300, 77336 or 77370)

(Procedure 77860 has been deleted. To report, use 77336)

(Procedure 77999 has been deleted. To report, use 77399)

[Statutory Authority: RCW 51.04.020(4) and 51.04.030, 87-16-004 (Order 87-18), § 296-23-080, filed 7/23/87; 83-16-066 (Order 83-23), § 296-23-080, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3), 81-24-041 (Order 81-28), § 296-23-080, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-080, filed 12/23/80, effective 3/1/81; Order 74-7, § 296-23-080, filed 1/30/74; Order 68-7, § 296-23-080, filed 11/27/68, effective 1/1/69.]

WAC 296-23-115 Repealed. See Disposition Table at beginning of this chapter.

NUCLEAR MEDICINE

WAC 296-23-125 Diagnostic.

	Unit Value
ENDOCRINE SYSTEM	
78000 Thyroid uptake, single determination	6.0
78001 multiple determinations (as 6 and 24 hours, etc.)	8.0
78003 Thyroid stimulation, suppression or discharge (not including initial uptake studies)	9.0
78006 Thyroid imaging, with uptake; single determination	16.0
78007 multiple determinations	18.0
78010 Thyroid imaging only	10.0
78011 with vascular flow	BR
78015 Thyroid carcinoma metastases imaging; limited area (e.g., neck and chest only)	20.0
78016 with additional studies (e.g., urinary recovery, etc.)	25.0
78017 multiple areas	BR
78018 whole body	BR

(For triiodothyronine true (TT-3), RIA, see 84480)

(For triiodothyronine, free (FT-3), RIA (unbound T-3 only), see 84481)

(For T-4 thyroxine, CPB or resin uptake, see 84435)

(For TT-4 thyroxine, RIA, see 84436)

(For T-4 thyroxine, neonatal, see 84437)

(For FT-4 thyroxine, free, RIA (unbound T-4 only), see 84439)

(For calcitonin, RIA, see 82308)

(78070 has been deleted. To report parathyroid imaging, use 78099)

78075 Adrenal imaging, cortical

(For adrenal cortex antibodies, RIA, see 86681)

(For cortisol, RIA, plasma, see 82533)

(For cortisol, RIA, urine, see 82534)

(For aldosterone, double isotope technique, see 82087)

(For aldosterone, RIA, blood, see 82088)

(For aldosterone, RIA, urine, see 82089)

(For 17-ketosteroids, RIA, see 83588)

(For 17-OH ketosteroids, RIA, see 83599)

(For 17-hydroxycorticosteroids, RIA, see 83491)

(For insulin, RIA, see 83525)

(For insulin antibodies, RIA, see 86337)

(For insulin factor antibodies, RIA, see 86338)

(For proinsulin, RIA, see 84206)

(For glucagon, RIA, see 82943)

(For adrenocorticotrophic hormone (ACTH), RIA, see 82024)

(For human growth hormone (HGH), (somatotropin), RIA, see 83003)

(For human growth hormone antibody, RIA, see 86277)

(For thyroglobulin antibody, RIA, see 86800)

(For thyroid microsomal antibody, RIA, see 86376)

(For thyroid stimulating hormone (TSH), RIA, see 84443)

(For thyrotropin releasing factor, RIA, see 84444)

(For plus long-acting thyroid stimulator (LATS), see 84445)

(For follicle stimulating hormone (FSH component of pituitary gonadotropin), RIA, see 83001)

(For luteinizing hormone (LH component of pituitary gonadotropin), (ICSH), RIA, see 83002)

(For luteinizing releasing factor (LRH), RIA, see 83727)

(For prolactin level (mammatropin), RIA, see 84146)

(For oxytocin level, (oxytocinase), RIA, see 83949)

(For vasopressin level (antidiuretic hormone), RIA, see 84588)

(For estradiol, RIA, see 82670)

	Unit Value		Unit Value
(For progesterone, RIA, see 84144)		(If combined with liver study, use procedures 78215 and 78216)	
(For testosterone, blood, RIA, see 84403)			
(For testosterone, urine, RIA, see 84405)		78186 with vascular flow	25.0
(For etiocholanolone, RIA, see 82696)		78191 Platelet survival	BR
(For chemical analysis, RIA tests, see WAC 296-23-212, chemistry and toxicology)		78192 White blood cell localization; limited area scanning	BR
78099 Unlisted endocrine procedure, diagnostic nuclear medicine	BR	78193 whole body	BR
(For chemical analysis, RIA tests, see Chemistry and Toxicology section)		78195 Lymphatics and lymph glands imaging	BR
		78199 Unlisted hematopoietic, R-E and lymphatic procedure, diagnostic nuclear medicine	BR
		(For chemical analysis, RIA tests, see WAC 296-23-212, chemistry and toxicology)	
HEMATOPOIETIC, RETICULOENDOTHELIAL AND LYMPHATIC SYSTEM		GASTROINTESTINAL SYSTEM	
78102 Bone marrow imaging; limited area	BR	78201 Liver imaging; static only	20.0
78103 multiple areas	BR	78202 with vascular flow	25.0
78104 whole body	BR	(For spleen imaging only, use 78185 and 78186)	
78110 Plasma volume, radionuclide-dilution technique; (separate procedure) single sampling	8.0	78215 Liver and spleen imaging; static only	25.0
78111 multiple sampling	BR+	78216 with vascular flow of liver and/or spleen	30.0
(For dye method, see 84605, 84610)		78220 Liver function study with hepatobiliary agents; with serial images	20.0
78120 Red cell volume determination (separate procedure); single sampling	12.0	(78221 has been deleted. To report liver function study with probe technique, use 78299)	
78121 multiple sampling	BR+	78223 Hepatobiliary ductal system imaging, including gallbladder	BR
78122 Whole blood volume determination, including separate measurement of plasma volume and red cell volume (radionuclide volume-dilution technique)	8.0	78225 Liver-lung study, imaging (e.g., subphrenic abscess)	BR
78130 Red cell survival study (e.g., radiochromium)	20.0	78230 Salivary gland imaging; static	14.0
78135 plus splenic and/or hepatic sequestration	30.0	78231 with serial views	16.0
78140 Red cell splenic and/or hepatic sequestration	20.0	78232 Salivary gland function study	BR
78160 Plasma radio-iron turnover rate	16.0	(78240 has been deleted. To report pancreas imaging, use 78299)	
78162 Radio-iron oral absorption	BR	78258 Esophageal motility	BR
78170 Radio-iron red cell utilization	24.0	78261 Gastric mucosa imaging	BR
78172 Chelatable iron for estimation of total body iron	BR	78262 Gastroesophageal reflux study	BR
(78180 has been deleted. To report radioiron body distribution and storage pools, use 78199)		78264 Gastric emptying study	BR
(For hemosiderin, RIA, see 83071)		78270 Vitamin B-12 absorption studies (e.g., Schilling test); without intrinsic factor	10.0
(For intrinsic factor antibodies, RIA, see 86340)		78271 with intrinsic factor	20.0
(For cyanocobalamin (vitamin B-12), RIA, see 82607)		78272 Vitamin B-12 absorption studies combined, with and without intrinsic factor	25.0
(For folic acid (folate) serum, RIA, see 82746)		78276 Gastrointestinal aspirate blood loss localization	BR
(For human hepatitis antigen, hepatitis associated agent (Australian antigen) (HAA), RIA, see 86287)		78278 Acute gastrointestinal blood loss imaging	BR
(For hepatitis A antibody (HAAb), RIA, see 86296)		78280 Gastrointestinal blood loss study (e.g., stool counting)	16.0
(For hepatitis A virus antibody (HAVAb), see 86297)		78282 Gastrointestinal protein loss (e.g., radiochromium albumin)	12.0
(For hepatitis B core antigen (HB _c Ag), RIA, see 86288)		(78285, 78286 have been deleted. To report gastrointestinal fat or fatty acid absorption studies, use 78299)	
(For hepatitis B core antibody (HB _c Ab), RIA, see 86289)		(For gastrin, RIA, see 82941)	
(For hepatitis B surface antigen (HB _s Ag), RIA, see 86287)		(For intrinsic factor level, see 83528)	
(For hepatitis B surface antibody (HB _s Ab), RIA, see 86291)		(For carcinoembryonic antigen level (CEA), RIA, see 86151)	
(For hepatitis Be antigen (HB _e Ag), RIA, see 86293)		78290 Bowel imaging (e.g., ectopic gastric mucosa, Meckel's localization, volvulus)	20.0
(For hepatitis Be antibody (HB _e Ab), RIA, see 86295)		78291 Peritoneal-venous shunt patency test (e.g., for LeVeen shunt)	BR
78185 Spleen imaging only; static	20.0	78299 Unlisted gastrointestinal procedure, diagnostic nuclear medicine	BR
		(For chemical analysis, RIA tests, see WAC 296-23-212, chemistry and toxicology)	

	Unit Value		Unit Value
MUSCULOSKELETAL SYSTEM			
(Bone and joint imaging can be used in the diagnosis of a variety of infectious inflammatory diseases, e.g., osteomyelitis, as well as for localization of primary and/or metastatic neoplasms)			
(For positron method or other complex instrumentation, see WAC 296-20-010, Item 10)			
78300		Bone, imaging limited area (e.g., spine, pelvis, or skull, etc.)	25.0
78305		multiple areas	40.0
78306		whole body	48.2
78310	BR	vascular flow only	
78315	BR	by three phase technique	
78350		Bone density (mineral content) study single photon absorptiometry	BR
78351	BR	dual photon absorptiometry	
78380	BR	Joint imaging; limited area	
78381	BR	multiple areas	
78399	BR	Unlisted musculoskeletal procedure, diagnostic nuclear medicine	
CARDIOVASCULAR SYSTEM			
(78401 has been deleted. To report, see 78402-78415)			
78402		Cardiac blood pool imaging with vascular flow assessment (sequential imaging with or without time activity curve evaluation)	25.0
78403		Cardiac blood pool imaging by gated equilibrium blood pool techniques with determination of global or regional ventricular function (specify right, left, or both) including but not necessarily limited to ejection fraction and wall motion, at rest;	BR
78404		with exercise and/or pharmacologic intervention, including but not necessarily limited to continuous vital signs and ECG monitoring, and treadmill or bicycle exercise for cardiovascular stress at submaximal or maximal levels	
78407		with determination of ventricular volume (specify right, left, or both)	BR
(78409 has been deleted. To report, use 78403)			
78411		Cardiac blood pool imaging by first pass technique, with determination of global or regional ventricular function (specify right, left, or both) including but not necessarily limited to ejection fraction and wall motion, at rest;	BR
78412		with exercise and/or pharmacologic intervention, including but not necessarily limited to continuous vital signs and ECG monitoring, and treadmill or bicycle exercise for cardiovascular stress at submaximal or maximal levels.	BR
(78413 has been deleted. To report, use 78411)			
(78405, 78406 Myocardium imaging has been deleted. To report, use 78418-78424)			
78414		Determination of ventricular ejection fraction with probe technique.	BR
78415		Cardiac blood pool imaging, functional imaging (e.g., phase and amplitude analysis)	
78418		Myocardium imaging; regional myocardial perfusion at rest	BR
78419		regional myocardial perfusion at rest and with exercise and/or pharmacologic intervention, including but not necessarily limited to continuous vital signs and ECG monitoring, and treadmill or bicycle exercise for cardiovascular stress at submaximal or maximal levels	
78420		with quantitative evaluation (e.g., pharmacokinetic temporal assessment)	
78422		for evaluation of infarction (infarct avid imaging)	BR
78424		regional myocardial perfusion (redistribution resting or postexercise study)	BR
78425		Regurgitant index	BR
78428		Cardiac shunt detection	BR
78435		Cardiac flow study, imaging (i.e., angiocardio-graphy)	BR
78445		Vascular flow study, imaging (i.e., angiography, venography)	BR
78455		Venous thrombosis study (e.g., radioactive fibrinogen)	BR
78457		Venous thrombosis imaging (e.g., venogram); unilateral	BR
78458		bilateral	BR
78470		Cardiac output	BR
(78490 has been deleted. To report tissue clearance studies, use 78499)			
(For digoxin, RIA, see 82643)			
(For digitoxin (digitalis), RIA, see 82640)			
78499		Unlisted cardiovascular procedure, diagnostic nuclear medicine	BR
(For chemical analysis, RIA tests, see WAC 296-23-212, chemistry and toxicology)			
RESPIRATORY SYSTEM			
78580		Pulmonary perfusion imaging; particulate	26.0
78581		gaseous	BR
78582		gaseous, with ventilation, rebreathing and washout	BR
78584		Pulmonary perfusion imaging, particulate, with ventilation; single breath	BR
78585		rebreathing and washout, with or without single breath	1.6
78586		Pulmonary ventilation imaging, aerosol; single projection	BR
78587		multiple projections (e.g., anterior, posterior, lateral views)	BR
78591		Pulmonary ventilation imaging, gaseous, single breath, single projection	BR
78593		Pulmonary ventilation imaging, gaseous, with rebreathing and washout with or without single breath; single projection	22.0
78594		multiple projections (e.g., anterior, posterior, lateral views)	BR
78599		Unlisted respiratory procedure, diagnostic nuclear medicine	BR
NERVOUS SYSTEM			
78600		Brain imaging, limited procedure; static	26.0
78601		with vascular flow	31.0
78605		Brain imaging, complete; static	30.0
78606		with vascular flow	35.0
78610		Brain imaging, vascular flow study only	10.0
78615		Cerebral blood flow, inert radionuclide gas washout	BR
78630		Cerebrospinal fluid flow, imaging; cisternography (not including introduction of material)	35.0
(For injection procedure, see 61000-61070; 62270-62294)			
78635		ventriculography	35.0
(For injection procedure, see 61000-61070; 62270-62294)			
(78640 has been deleted. To report, use 78699)			
(For injection procedure, see 61000-61070; 62270-62294)			
78645		shunt evaluation	35.0

	Unit Value		Unit Value
		(For injection procedure, see 61000-61070; 62270-62294)	
78650	32.0	CSF leakage detection and localization	
		(For injection procedure, see 61000-61070; 62270-62294)	
		(For myelin basic protein, CSF, RIA, see 83873)	
78655	BR	Eye tumor identification with radiophosphorus . . .	
78660	BR	Dacryocystography (lacrima flow study)	
78699	BR	Unlisted nervous system procedure, diagnostic nuclear medicine	
GENITOURINARY SYSTEM			
78700	18.0	Kidney imaging; static only	
78701	20.0	with vascular flow	
78704	23.0	with function study (i.e., imaging renogram) . .	
78707	30.0	with vascular flow and function study	
		(For introduction of radioactive substance in association with renal endoscopy, see 50558, 50559, 50578)	
78715	BR	Kidney vascular flow	
78725	BR	Kidney function study only	
78726	BR	with pharmacological intervention	
		(For renin (angiotensin I), RIA, see 84244)	
		(For angiotensin II, RIA, see 82163)	
		(For beta-2 microglobulin, RIA, see 82231, 82232)	
78727	BR	Kidney transplant evaluation	
78730	BR	Urinary bladder residual study	
		(For introduction of radioactive substance in association with cystotomy or cystostomy, see 51020; in association with cystourethroscopy, see 52250)	
78740	BR	Ureteral reflux study (radionuclide voiding cystogram)	
		(For estradiol, RIA, see 82670)	
		(For estriol, RIA, see 82677, 84680)	
		(For progesterone, RIA, see 84144)	
		(For prostatic acid phosphatase, RIA, see 84066)	
78760	BR	Testicular imaging	
78761	BR	with vascular flow	
		(For testosterone, blood, RIA, see 84403)	
		(For testosterone, urine, RIA, see 84405)	
		(For introduction of radioactive substance in association with ureteral endoscopy, see 50958, 50959, 50978)	
		(78770, 78775 have been deleted. To report either placenta imaging or placenta localization, use 78799)	
		(For lactogen, placental (HPL) chorionic somatomammotropin, RIA, see 83632)	
		(For chorionic gonadotropin, RIA, see 82998)	
		(For chorionic gonadotropin beta subunit, RIA, see 84701)	
		(For pregnanediol, RIA, see 84135)	
		(For pregnantrial, RIA, see 84138)	
78799	BR	Unlisted genitourinary procedure, diagnostic nuclear medicine	
		(For chemical analysis, RIA tests, see WAC 296-23-212 chemistry and toxicology)	
MISCELLANEOUS STUDIES			
78800		Tumor localization (e.g., gallium, selenomethionine); limited area	BR
		(For specific organ, see appropriate heading)	
		(For eye tumor identification, see 78655)	
78801		multiple areas	BR
78802		whole body	BR
78805		Abscess localization; limited area	BR
78806		whole body	BR
		(For imaging bone infectious inflammatory disease, see 78300-78381)	
		(For Rast, see 86421, 86422)	
		(For gamma-E immunoglobulin, RIA, see 82785)	
		(For gamma-G immunoglobulin, see 82784)	
		(For alpha-1 antitrypsin, RIA, see 86064)	
		(For alpha-1 fetoprotein, RIA, see 86244)	
		(For antinuclear antibodies, RIA, see 86038)	
		(For lactic dehydrogenase, RIA, see 83610)	
		(For amikacin, see 82112)	
		(For aminophylline, see 82137)	
		(For amitriptyline, see 82138)	
		(For amphetamine, chemical, quantitative, see 82145)	
		(For chlordiazepoxide, see 82420, 82425)	
		(For chlorpromazine, see phenothiazine, urine, 84021, 84022)	
		(For clonazepam, see 82510)	
		(For cocaine, quantitative, see 82520)	
		(For diazepam, see 82636)	
		(For dihydromorphinone, quantitative, see 82649)	
		(For phenytoin (diphenylhydantoin), see 84045)	
		(For flucytosine, see 82741)	
		(For gentamicin, see 84695)	
		(For glutethimide, see 82980)	
		(For lysergic acid diethylamide (LSD), RIA, see 83728)	
		(For morphine (heroin), RIA, see 83862)	
		(For phencyclidine (PCP), see 83992)	
		(For phenobarbital, see barbiturates, 82205, 82210)	
		(For tobramycin, see 84840)	
		(For kanamycin, see 83578)	
78890		Generation of automated data: Interactive process involving nuclear physician and/or allied health professional personnel; simple manipulations and interpretation, not to exceed 30 minutes	BR
78891		complex manipulations and interpretation, exceeding 30 minutes	BR
		(use 78890 or 78891 in addition to primary procedure)	

	Unit Value
78895 Bedside unit required	BR
(use 78895 in addition to primary procedure)	
78990 Provision of diagnostic radionuclide(s)	12.0
78999 Unlisted miscellaneous procedure, diagnostic nuclear medicine	BR

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-125, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-125, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-23-125, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-125, filed 12/23/80, effective 3/1/81; Order 74-7, § 296-23-125, filed 1/30/74. Formerly WAC 296-23-100.]

PATHOLOGY

WAC 296-23-20102 Pathology modifier. MODIFIERS: Listed services and procedures may be modified under certain circumstances. When applicable, the modifying circumstance should be identified by the addition of the appropriate modifier code, which is a two digit number placed after the usual procedure number from which it is separated by a hyphen. If more than one modifier is used, the "multiple modifiers" code placed first after the procedure code indicates that one or more additional modifier codes will follow. All modifiers and their respective codes are listed in Appendix A. Modifiers commonly used in PATHOLOGY AND LABORATORY are as follows:

- 22 UNUSUAL SERVICES: When the service(s) provided is greater than that usually required for the listed procedure, it may be identified by adding modifier '-22' to the usual procedure number. A report may also be appropriate. BR
- 26 PROFESSIONAL COMPONENT: Certain procedures (e.g., laboratory, radiology, electrocardiogram, specific diagnostic and therapeutic services) are a combination of a physician component and a technical component. When the professional component is reported separately, the service may be identified by adding the modifier '-26' to the usual procedure number. Payment is made on the basis of up to and including forty percent of the fee maximum.
- 52 REDUCED SERVICES: Under certain circumstances a service or procedure is partially reduced or eliminated at the doctor's election. Under these circumstances the service provided can be identified by its usual procedure number and the addition of the modifier '-52', signifying that the service is reduced. This provides a means of reporting

reduced services without disturbing the identification of the basic service.

- 90 REFERENCE (OUTSIDE) LABORATORY: When laboratory procedures are performed by a party other than the treating or reporting doctor, the procedure may be identified by adding the modifier '-90' to the usual procedure number. The procedure shall be billed as charged to the ordering doctor. BR

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23-20102, filed 1/8/87; 83-16-066 (Order 83-23), § 296-23-20102, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-20102, filed 12/23/80, effective 3/1/81.]

WAC 296-23-204 Panel or profile tests.

The following list contains those tests that can be and are frequently done as groups and combinations ("profiles") on automated multichannel equipment. For any combination of tests among those listed immediately below, use the appropriate number 80002-80019. Groups of the tests listed here are distinguished from multiple tests performed individually for immediate or "stat" reporting.

The following unit values apply when three or more of the tests listed below are performed on the same blood or urine specimen under the conditions described under item 6, page 188.

(For collection and handling of specimen, see 99000 and 99001)

- Albumin
- Albumin/globulin ratio
- Bilirubin, direct
- Bilirubin, total
- Calcium
- Carbon dioxide content
- Chloride
- Cholesterol
- Creatinine
- Globulin
- Glucose (sugar)
- Lactic dehydrogenase (LDH)
- Phosphatase, acid
- Phosphatase, alkaline
- Phosphorus
- Potassium
- Protein, total
- Sodium
- Transaminase, glutamic, oxaloacetic (SGOT)
- Transaminase, glutamic, pyruvic (SGPT)
- Urea nitrogen (BUN)
- Uric acid

	Unit Value
80002 Automated multichannel test; 1 or 2 clinical chemistry test(s)	21.0

	Unit Value
80003	3 clinical chemistry tests 28.0
80004	4 clinical chemistry tests 32.0
80005	5 clinical chemistry tests 36.0
80006	6 clinical chemistry tests 40.0
80007	7 clinical chemistry tests 44.0
80008	8 clinical chemistry tests 48.0
80009	9 clinical chemistry tests 52.0
80010	10 clinical chemistry tests 56.0
80011	11 clinical chemistry tests 60.0
80012	12 clinical chemistry tests 64.0
80016	13-16 clinical chemistry tests 66.8
80018	17-18 clinical chemistry tests 69.6
80019	19-24 clinical chemistry tests 72.4
80020	25-30 clinical chemistry tests 75.2
80021	31 or more clinical chemistry tests 78.0

THERAPEUTIC DRUG MONITORING

(e.g., antiepilepsy drugs, cardiac drugs, antibiotics, sedatives)

80031	Therapeutic quantitative drug monitoring in blood and/or urine; measurement one drug (if drug not specified by individual code number)	BR
80032	2 drugs measured	BR
80033	3 drugs measured	BR
80034	4 or more drugs measured	BR
80040	Serum radioimmunoassay for circulating antibiotic levels	BR

ORGAN OR DISEASE ORIENTED PANELS

Organ "panels" as an approach to diagnosis have been developed in response to the increased use of general screening programs that are now in use in physicians' offices, health centers, clinics, and hospitals. Also included here are profiles that combine laboratory tests together under a problem oriented classification. The lack of an expanded list of laboratory tests under each number is deliberate. Because no two laboratories utilize the same array of tests in a particular panel, each laboratory should establish its own profile and accompany each reported panel by a listing of the components of that panel performed by the laboratory.

	Unit Value	
80050	General health screen panel	BR
80056	Amenorrhea profile	BR
80057	Male infertility and/or gynecomastia profile	BR
80058	Hepatic function panel	BR
80059	Hepatitis panel	BR
80060	Hypertension panel	BR
80061	Lipid profile	BR
80062	Cardiac evaluation (including coronary risk) panel	BR
80063	Cardiac injury panel;	BR
80064	with creatine phosphokinase (CPK) and/or lactic dehydrogenase (LDH) isoenzyme determination	BR
80065	Metabolic panel	BR
80066	Malabsorption panel	BR
80067	Pulmonary (lung function) panel	BR
80068	Lung maturity profile	BR
80070	Thyroid panel;	BR
80071	with thyrotropin releasing hormone (TRH)	BR
80072	Arthritis panel	BR
80073	Renal panel	BR
80075	Parathyroid panel	BR
80080	Prostatic panel	BR
80082	Pancreatic panel	BR
80084	Pituitary panel	BR
80085	Microcytic anemia panel	BR
80086	Macrocytic anemia panel	BR
80089	Muscle panel	BR
80090	Antibody panel (e.g., TORCH: Toxoplasma IFA, rubella HI, cytomegalovirus CF, herpes virus CF)	BR

	Unit Value	
80099	Unlisted panel	BR

CONSULTATIONS (CLINICAL PATHOLOGY)

A clinical pathology consultation is a service, including a written report, rendered by the pathologist in response to a request from an attending physician in relation to a test result(s) requiring additional medical interpretive judgment. Reporting of a test result(s) without medical interpretive judgment is not considered a clinical pathology consultation.

80500	Clinical pathology consultation; limited, without review of patient's history and medical records	BR
80502	comprehensive, for a complex diagnostic problem, with review of patient's history and medical records	BR

(For consultations involving the examination and evaluation of the patient, see 90600-90643)

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-204, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-204, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-23-204, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-204, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-204, filed 12/23/80, effective 3/1/81; Order 74-39, § 296-23-204, filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-204, filed 1/30/74.]

WAC 296-23-212 Chemistry and toxicology.

The material for examination can be from any source. Examination is quantitative unless specified. (For list of automated, multi-channel tests, see 80003-80019.)

	Unit Value	
82000	Acetaldehyde, blood	40.0
82003	Acetaminophen, urine	40.0
(Acetic anhydride, see volatiles, 84600)		
82005	Acetoacetic acid, serum	40.0
82009	Acetone, qualitative	12.0
82010	quantitative	12.0
(For acetone bodies, see 82009-82010, 82635, 83947)		
82011	Acetylsalicylic acid; quantitative	32.0
82012	qualitative	32.0
82013	Acetylcholinesterase	40.0
(Acid, gastric, see gastric acid, 82926-82932)		
(Acid phosphatase, see 84060-84065)		
82015	Acidity, titratable, urine	30.0
(ACTH, see 82024)		
(Adrenalin-Noradrenalin, see catecholamines, 82382-82384)		
82024	Adrenocorticotrophic hormone (ACTH), RIA	120.0
82030	Adenosine; 5'-diphosphate (ADP) and 5'-monophosphate (AMP), cyclic, RIA, blood	40.0
82035	5'-triphosphate, blood	40.0
82040	Albumin, serum	20.0
82042	urine, quantitative (specify method, e.g., Esbach)	20.0
(For albumin/globulin ratio, albumin/globulin ratio by electrophoretic method, see 84155-84200)		
82055	Alcohol (ethanol), blood, chemical	30.0
82060	by gas-liquid chromatography	40.0
82065	urine, chemical	30.0
82070	by gas-liquid chromatography	40.0
82072	Alcohol (ethanol) gelation	30.0
82075	breath	60.0
82076	Alcohol; isopropyl	60.0

	Unit Value		Unit Value
82078 methyl	60.0		
82085 Aldolase, blood, kinetic ultraviolet method	26.0	(Atherogenic index, blood, ultracentrifugation, quantitative, see 83717)	
82086 colorimetric	20.0		
82087 Aldosterone; double isotope technique	120.0	82205 Barbiturates quantitative	60.0
82088 RIA blood	100.0	82210 quantitative and identification	80.0
82089 RIA urine	100.0	(For qualitative screen, see 82486, 82660, 82662, 82755, 84231)	
82091 saline infusion test	BR	82225 Barium	BR
(Alkaline phosphatase, see 84075-84080)		(Bence-Jones protein, 84185)	
82095 Alkaloids, tissue, screening	80.0	82230 Beryllium, urine	80.0
82096 quantitative	120.0	82231 Beta-2 microglobulin, RIA; urine	BR
82100 urine, screening	80.0	82232 serum	BR
82101 quantitative	120.0	82235 Bicarbonate excretion, urine	BR
(See also 82486, 82600, 82662, 82755, 84231)		82236 Bicarbonate loading test	BR
(Alpha amino acid nitrogen, see 82126)		(Bicarbonate, see 82374)	
(Alpha-hydroxybutyric (HBD) dehydrogenase, see 83485, 83486)		82240 Bile acids, blood, fractionated	120.0
(Alphaketoglutarate, see 83584)		82245 Bile pigments, urine	8.0
(Alpha tocopherol (Vitamin E), see 84446)		82250 Bilirubin, blood, total or direct	24.0
82112 Amikacin	BR	82251 blood, total and direct	30.0
(Amikacin serum radioimmunoassay, see 80040)		82252 feces, qualitative	BR
82126 Alpha amino acid nitrogen	50.0	82260 urine, quantitative	12.0
82128 Amino acids, qualitative	40.0	82265 amniotic fluid, quantitative	30.0
82130 Amino acids, urine or plasma chromatographic fractionation and quantitation	180.0	82268 Bismuth	80.0
82134 Aminohippurate, para (PAH)	30.0	82270 Blood, feces, occult, screening	8.0
(For administration, see 36410, 99070)		82273 duodenal, gastric contents, qualitative	BR
82135 Aminolevulinic acid, delta (ALA)	50.0	(Blood urea nitrogen (BUN), see 84520-84525, 84545)	
82137 Aminophylline	60.0	(Blood volume, see 84605-84610, 78110, 78111)	
82138 Amitriptyline	60.0	82280 Boric acid, blood	100.0
82140 Ammonia, blood	40.0	82285 urine	100.0
82141 urine	40.0	82286 Bradykinin	BR
82142 Ammonium chloride loading test	40.0	82290 Bromides, blood	24.0
82143 Amniotic fluid scan (spectrophotometric)	50.0	82291 urine	40.0
(For L/S ratio, see 83661)		(For bromsulphthalein (BSP), see 84382)	
(Amobarbital, see 82205-82210)		82300 Cadmium, urine	100.0
82145 Amphetamine, or methamphetamine, chemical, quantitative	80.0	82305 Caffeine	60.0
82150 Amylase, serum	30.0	82306 Calcifediol (25-OH Vitamin D-3), chromatographical technique	BR
82155 isoenzymes electrophoretic	BR+	82307 Calciferol (Vitamin D) RIA	BR
82156 urine (diastase)	30.0	82308 Calcitonin, RIA	80.0
82157 Androstenedione RIA	80.0	82310 Calcium, blood, chemical	22.0
82159 Androsterone	50.0	82315 fluorometric	22.0
82160 RIA	50.0	82320 emission flame photometry	22.0
(See also 83593-83596)		82325 atomic absorption flame photometry	24.0
(Angiotensin I, see renin, 84244)		82330 fractionated, diffusible	60.0
82163 Angiotensin II, RIA	BR	82331 after calcium infusion test	24.0
82164 Angiotensin-converting enzyme	BR	82335 urine, qualitative (Sulkowitch)	11.0
82165 Aniline	BR	82340 quantitative timed specimen	32.0
(Antidiuretic hormone, RIA, see 84588)		82345 feces, quantitative timed specimen	80.0
82168 Antihistamines	BR	82355 Calculus (stone) qualitative, chemical	40.0
82170 Antimony, urine	80.0	82360 quantitative, chemical	60.0
(Antimony, screen, see 83015)		82365 infrared spectroscopy	60.0
(Antitrypsin, alpha-1-, see 86329)		82370 X-ray diffraction	50.0
82172 Apolipoprotein	BR	(Carbamates, see individual listings)	
82173 Arginine tolerance test	BR	82372 Carbamazepine, serum	BR
82175 Arsenic, blood, urine, gastric contents, hair or nails, quantitative	80.0	82374 Carbon dioxide, combining power or content	10.0
(For heavy metal screening, see 83015)		(See also 82801-82803, 82817)	
82180 Ascorbic acid (Vitamin C) blood	40.0	82375 Carbon monoxide, (carboxyhemoglobin); quantitative	48.0
(Aspirin, see acetylsalicylic acid, 82011, 82012)		82376 qualitative	48.0
		(Carbon tetrachloride, see 84600)	
		(Carboxyhemoglobin, see 82375, 82376)	
		82380 Carotene, blood	40.0
		(Carotene plus Vitamin A, see 84595)	

	Unit Value		Unit Value
82382 Catecholamines (dopamine, norepinephrine, epinephrine); total urine	BR	82537 48 hours after continuous ACTH infusion	BR
82383 blood	BR	82538 after metyrapone tartrate administration	BR
82384 fractionated	BR	82539 dexamethasone suppression test, plasma and/or urine	BR
(For urine metabolites, see 83835, 84585)		82540 Creatine, blood	24.0
82390 Ceruloplasmin, chemical (copper oxidase), blood	40.0	82545 urine	40.0
(For gel diffusion technique, see 86331; immunodiffusion technique, see 86329)		82546 Creatine and creatinine	50.0
82400 Chloral hydrate, blood	60.0	82550 Creatine phosphokinase (CPK), blood, timed kinetic ultraviolet method	26.0
82405 urine	40.0	82552 isoenzymes	30.0
82415 Chloramphenicol, blood	40.0	82555 colorimetric	20.0
82418 Chlorazepate dipotassium	40.0	82565 Creatinine, blood	°20.0
82420 Chlordiazepoxide, blood	60.0	82570 urine	°20.0
82425 urine	60.0	82575 clearance	°40.0
82435 Chlorides, blood, (specify chemical or electrometric)	°20.0	82585 Cryofibrinogen, blood	40.0
82436 urine, (specify chemical, electrometric or Fantus test)	20.0	82595 Cryoglobulin, blood	40.0
82437 sweat (without iontophoresis)	20.0	(Crystals, pyrophosphate vs. urate, see 84208)	
(For iontophoresis, see 89360)		82600 Cyanide, blood	80.0
82438 spinal fluid	20.0	82601 tissue	80.0
82441 Chlorinated hydrocarbons, screen	20.0	82606 Cyanocobalamin (Vitamin B-12); bioassay	70.0
82443 Chlorothiazide-hydrochlorothiazide	60.0	82607 RIA	45.0
(Chlorpromazine, see 84021, 84022)		82608 unsaturated binding capacity	60.0
82465 Cholesterol, serum; total	°22.0	(Cyclic AMP, see 82030)	
82470 total and esters	30.0	(Cyclic GMP, see 83008)	
82480 Cholinesterase, serum	40.0	82614 Cystine, blood, qualitative	BR
82482 RBC	60.0	82615 Cystine, and homocystine, urine, qualitative	30.0
82484 serum and RBC	80.0	82620 quantitative	40.0
82485 Chondroitin B sulfate, quantitative	BR	82624 Cystine aminopeptidase	BR
(Chorionic gonadotropin, see gonadotropin, 82996-83002)		(D hemoglobin, see 83053)	
82486 Chromatography; gas-liquid, compound and method not elsewhere specified	BR	(Delta-aminolevulinic acid (ALA), see 82135)	
82487 paper, 1-dimensional, compound and method not elsewhere specified	BR	82626 Dehydroepiandrosterone, RIA	BR
82488 paper, 2-dimensional, not elsewhere specified	BR	(See also 83593-83596)	
82489 thin layer, not elsewhere specified	BR	(Deoxycortisol, 11- (compound S), RIA, see 82634)	
82490 Chromium, blood	100.0	82628 Desipramine	BR
82495 urine	100.0	82633 Desoxycorticosterone, 11-RIA	BR
82505 Chymotrypsin, duodenal contents	30.0	(See also 83593-83596)	
82507 Citric acid	80.0	82634 Desoxycortisol, 11-(compound S), RIA	80.0
82512 Clonazepam	BR	(See also 83492)	
82520 Cocaine, quantitative	60.0	82635 Diacetic acid	18.0
(Cocaine, screen, see 82486, 82660, 82662, 82755, 84231)		(Diagnex blue, tubeless gastric, see 82939)	
(Codeine, quantitative, see 82096, 82101)		(Diastase, urine, see 82156)	
(Complement, see 86159-86162)		82636 Diazepam	50.0
(Compound S, see 82634)		82638 Dibucaine number	34.0
82525 Copper, blood	60.0	82639 Dicumarol	BR
82526 urine	60.0	(Dichloroethane, see 84600)	
(Coprobilinogen, feces, 84575)		(Dichloromethane, see 84600)	
(Coproporphyrins, see 84118-84121)		(Diethylether, see 84600)	
(Corticosteroids, see 83492-83496)		82640 Digitoxin digitalis, blood RIA	BR+
82528 Corticosterone, RIA	BR	82641 urine	BR+
(See also 83593-83597)		82643 Digoxin, RIA	36.0
82529 Cortisol; fluorometric, plasma	36.0	82646 Dihydrocodinone	BR
82531 CPB, plasma	75.0	(Dihydrocodinone screen, see 82486-82489, 82662, 82755, 84231)	
82532 CPB, urine	75.0	82649 Dihydromorphinone, quantitative	75.0
82533 RIA, plasma	90.0	(Dihydromorphinone screen, see 82486, 82489, 82662, 82755, 84231)	
82534 RIA, urine	90.0	82651 Dihydrotestosterone (DHT)	BR
82536 after adrenocorticotrophic hormone (ACTH) Administration	BR	82652 Dihydroxy vitamin D, 1, 25	BR
		82654 Dimethadione	BR

	Unit Value		Unit Value
(Diphenylhydantoin, see 84045)		(Fructose, TLC screen, see 84375)	
(Dopamine, see 82382-82384)		82759 Galactokinase, RBC	BR
82656 Doxepin	BR	82760 Galactose, blood	40.0
82660 Drug screen (amphetamines, barbiturates, alkaloids)	65.0	82763 tolerance test	75.0
(See also 82486-82489, 82662, 82755, 84231)		82765 urine	40.0
(Duodenal contents, see individual enzymes; for intubation and collection, see 89100)		82775 Galactose-1-phosphate uridyl transferase	60.0
82662 Enzyme immunoassay technique for drugs, EMIT	30.0	(For TLC screen, see 84375)	
82664 Electrophoretic technique, not elsewhere specified	45.0	82776 screen	18.0
82666 Epiandrosterone	BR	82780 Gallium	BR
(See also 83593, 83596)		82784 Gammaglobulin, A, D, G, M nephelometric, each	12.0
(Epinephrine, see 82382-82384)		82785 Gammaglobulin, E, (e.g., RIA, EIA)	75.0
82668 Erythropoietin, bioassay	BR	82786 Gammaglobulin, salt precipitation method	21.0
(For HI method, see 86280)		(Gammaglobulin by gel (immuno) diffusion, see 86329)	
82670 Estradiol, RIA (placental)	90.0	(Gamma-glutamyl transpeptidase (GGT), see 82977)	
82671 Estrogens; fractionated	85.0	82790 Gases, blood, oxygen saturation; by calculation from pO ₂	40.0
82672 total	60.0	82791 by manometry	40.0
82673 Estriol; fluorometric	54.0	82792 by oximetry	20.0
82674 GLC	45.0	82793 by spectrophotometry	40.0
82676 Chemical	75.0	82795 by calculation from pCO ₂	6.0
82677 RIA	105.0	82800 Gases, blood, pH, only	20.0
(Estrogen receptor assay, see 84233)		82801 pCO ₂	24.0
82678 Estrone; chemical	75.0	82802 pH, pCO ₂ by electrode	42.0
82679 RIA	90.0	82803 pH, pCO ₂ , pO ₂ simultaneous	54.0
(Ethanol, see 82055-82075)		82804 pO ₂ by electrode	40.0
82690 Ethchlorvynol (Placidyl), blood	60.0	82812 pO ₂ by manometry	24.0
82691 urine	60.0	82817 pH, pCO ₂ by tonometry	24.0
82692 Ethosuximide	BR	(For arterial puncture, see 36600)	
(Ethyl alcohol, see 82055-82075)		(For blood gas studies as a part of pulmonary function studies, see 94700-94710)	
82694 Etiocholanolone	BR	82926 Gastric acid, free and total; single specimen	11.2
(See also 83593, 83596)		82927 each additional specimen	9.0
(Evans blue, see blood volume, 84605-84610)		82928 Gastric acid, free or total; single specimen	9.0
82696 Etiocholanolone, RIA	50.0	82929 each additional specimen	7.5
82705 Fat or lipids, feces, screening	10.0	82931 Gastric acid, pH titration; single specimen	24.0
82710 quantitative, 24 or 72 hour specimen	100.0	82932 each additional specimen	18.0
82715 Fat differential, feces, quantitative	BR	(Gastric analysis, with stimulation, see 89140, 89141)	
82720 Fatty acids, blood, esterified	40.0	(Gastric analysis, pepsin, see 83974)	
82725 nonesterified	40.0	(For gastric intubation, see 89130, 74340)	
82727 Ferric chloride, urine	BR	(For aspiration of specimens with insulin administration (Hollander test), see 91075)	
82728 Ferritin, specify method (e.g., RIA, immunoradiometric assay)	BR	82938 Gastrin (serum) after secretin stimulation (e.g., for gastrinoma, Zollinger-Ellison syndrome)	BR
(Fetal hemoglobin, see hemoglobin 83020, 83033, and 85460)		82941 Gastrin, RIA	48.0
(Fetoprotein, alpha-1, see 86329)		(GGT, see 82977)	
82730 Fibrinogen, quantitative	21.0	(GLC, gas liquid chromatography, see 82486)	
(See also 85371, 85377)		82942 Globulin, serum	10.5
82735 Fluoride, blood	100.0	(See also 82784, 82786, 84155-84200, 86329)	
82740 urine	100.0	82943 Glucagon, RIA	BR
82741 Flucytosine (5-fluorocytosine)	BR	82944 Glucosamine	6.0
82742 Flurazepam	BR	82946 Glucagon tolerance test	BR
82745 Folic acid, (folate), blood bioassay	BR+	82947 Glucose; except urine (e.g., blood, spinal fluid, joint fluid)	10.5
82746 RIA	45.0	82948 blood, stick test	8.2
(Follicle stimulating hormone (FSH), see 83000, 83001)		82949 fermentation	22.5
82750 Formimino-glutamic acid (FIGLU), urine	100.0	82950 post glucose dose (includes glucose)	13.5
82755 Free radical assay technique for drugs (FRAT)	BR	82951 tolerance test (GTT), three specimens (includes glucose)	37.5
82756 Free thyroxine index (T-7)	BR	82952 tolerance test, each additional beyond three specimens	10.5
82757 Fructose, semen	BR	(For intravenous glucose tolerance test, see 82961)	

	Unit Value		Unit Value
82953	15.0	(HIAA, see 83497)	
		83086	BR
(For insulin tolerance test, see 82937)		83087	BR
(For leucine tolerance test, see 83681)		83088	100.0
82954	20.0	(Hollander test, see 91075)	
		(Homocystine, qualitative, see 82615)	
(For intubation, see 89130, 79340)		(Homocystine, quantitative, see 82620)	
82955	60.0	83093	BR
82960	56.0	83094	20.0
82961	BR	83095	40.0
(For glucose tolerance test with medication use 90784 in addition)		(Hormones, see individual alphabetic listings in chemistry section)	
82963	BR	83150	80.0
82965	40.0	83485	22.0
(Glutamic oxaloacetic transaminase (SGOT), see 84450-84455)			20.0
(Glutamic pyruvic transaminase (SGPT), see 84460-84465)		83486	20.0
82975	80.0	83491	64.1
82977	BR	83492	82.0
82978	BR		45.0
82979	BR	83493	45.0
82980	56.2	83494	38.0
(Glycohemoglobin, see 83036)		83495	52.0
82985	60.0	83496	52.0
82995	100.0	(See also 82531-82534, 82634, 84409)	
(82996-82998, Gonadotropin, chorionic, have been deleted, use 84702-84703)		83497	60.0
83000	90.0	(For HIAA, blood, see 84260)	
83001	90.0	83498	105.0
83002	90.0	83499	BR
83003	48.0	83500	100.0
83004	48.0	83505	100.0
(For growth hormone secretion after arginine tolerance test, see 82173)		83510	180.0
(For human growth hormone antibody, RIA, see 86277)		83523	67.0
83005	40.0	(Immunoglobulines, see 82784, 82785, 82786, 86329, 86335)	
83008	BR	83524	35.0
83010	60.0	83525	40.0
83011	30.0	83526	80.0
83012	60.0	(For proinsulin, see 84206)	
83015	30.0	83528	BR
83018	BR	(For intrinsic factor antibodies, RIA, see 86340)	
83020	80.0	83530	40.0
(Hemoglobin, carboxyhemoglobin (CO), see 82375, 82376; colorimetric, see 85018, 85031)		(For administration, see 36410, 99070)	
83030	40.0	(83533, 83534 protein bound iodine have been deleted. To report, use 84999)	
83033	56.0	(For thyroxine, see 84435-84439)	
83036	60.0	(For triiodothyronine (true T-3), RIA, see 84480)	
83040	80.0	(For T-3 or T-4 radioactive resin uptake, see RT3U, 84250; for RT3U+thyroxine, see 84251)	
83045	20.0	83540	20.0
83050	40.0	83545	12.0
83051	40.0	83546	30.0
83052	34.0	83550	20.0
83053	40.0	83555	12.0
83055	20.0	83565	30.0
83060	40.0	83570	26.0
83065	BR	83571	20.0
83068	BR	(Isopropyl alcohol, see alcohol 82076)	
83069	BR	83576	105.0
83070	12.0	83578	49.0
83071	25.6	83582	45.0
(Heroin, screening, see 82660, 82486, 82662, 82755, 84231; quantitative, see 82096, 82101)			

	Unit Value		Unit Value
83583 11-desoxy: 11-oxy ratio	75.0	83735 Magnesium, blood, chemical	20.0
83584 Ketoglutarate, alpha	40.0	83740 fluorometric	20.0
(Ketone bodies, see 82005-82010; urine, see 81000-81005)		83750 atomic absorption	40.0
83586 Ketosteroids, 17-(17-KS), blood; total	38.0	83755 urine, chemical	40.0
83587 fractionation, alpha/beta	75.0	83760 fluorometric	40.0
83588 RIA	54.0	83765 atomic absorption	40.0
83589 Ketosteroids, 17-(17-KS), urine; total	36.0	83775 Malate dehydrogenase, kinetic ultraviolet method	30.0
83590 fractionation, alpha/beta	60.0	(Maltose tolerance, see 82951, 82952)	
83593 chromatographic fractionation	75.0	(Mammotropin, see 84146)	
(83596 D/A/E ratio has been deleted.)		83785 Manganese, blood or urine	60.0
83597 11-desoxy: 11-oxy ratio	75.0	83790 Mannitol clearance	BR
(See also 82528, 82632, 82633, 82666, 82694)		(Marijuana, see tetrahydrocannabinol THC, 84408)	
83599 Ketosteroids, 17-OH, RIA	64.1	83795 Melanin, urine, quantitative	60.0
83600 Kynurenic acid	90.0	83799 Meperidine, quantitative	54.0
83605 Lactate, lactic acid	40.0	(For screen, see 82486, 82489, 82662, 82755, 84231)	
83610 Lactic dehydrogenase (LDH), RIA	33.7	83805 Meprobamate, blood or urine	60.0
83615 Lactic dehydrogenase (LDH), blood, kinetic ultraviolet method	26.0	(For screen, see 82486, 82489, 84231)	
83620 colorimetric or fluorometric	20.0	83825 Mercury quantitative, blood	70.0
83624 heat or urea inhibition (total not included)	24.0	83830 urine	70.0
83625 isozymes, electrophoretic separation and quantitation	60.0	(Mercury screen, see 83015)	
83626 chemical separation	20.0	83835 Metanephrines, urine	52.0
83628 Lactic dehydrogenase, liver (LLDH)	20.0	(For catecholamines, see 82382-82384)	
83629 Lactic dehydrogenase (LDH), urine	20.0	83840 Methadone	60.0
83631 Lactic dehydrogenase (LDH), CSF	20.0	(Methamphetamine, see 82145)	
(For hydroxybutyric dehydrogenase (HBD), see 83485)		(Methanol, see 82078)	
83632 Lactogen, human placental (HPL) chorionic somatomammotropin, RIA	30.0	83842 Methapyrilene	50.0
83633 Lactose, urine; qualitative	20.0	83845 Methaqualone	90.0
83634 quantitative	20.0	(For metals, heavy, screening (Reinsch test), see 82177)	
(For tolerance, see 82951-82952)		83857 Methemalbumin	32.0
(For TLC screen, see 84375)		(Methemoglobin, see hemoglobin 83045-83050)	
83645 Lead, screening, blood	20.0	83858 Methsuximide, serum	90.0
83650 urine	20.0	(Methyl alcohol, see 82078)	
83655 quantitative, blood	60.0	83859 Methypylon	90.0
83660 urine	60.0	83860 Morphine, screening	80.0
83661 Lecithin-sphingomyelin ratio (L/S ratio), amniotic fluid	75.0	83861 quantitative	120.0
83670 Leucine amino-peptidase (LAP), blood, kinetic ultraviolet method	26.0	83862 RIA	82.0
83675 colorimetric	20.0	83864 Mucopolysaccharides, acid, blood	60.0
83680 urine	26.0	83865 Mucopolysaccharides, acid, urine quantitative	60.0
83681 Leucine tolerance test	26.0	83866 screen	21.0
83685 Lidocaine	20.0	83870 Mucoprotein, blood (seromucoid)	40.0
83690 Lipase, blood	30.0	83872 Mucin, synovial fluid (rope test)	21.0
83700 Lipids, blood, total	30.0	83873 Myeline basic protein, CSF, RIA	BR
83705 fractionated (cholesterol, triglycerides, phospholipids)	60.0	(For oligoclonal bands, see 83916)	
(For feces, see 82705-82715)		83874 Myoglobin, electrophoresis	30.0
83715 Lipoprotein, blood; electrophoretic separation and quantitation phenotyping	60.0	83875 Myoglobin, urine	40.0
83717 analytic ultracentrifugation separation and quantitation (atherogenic index)	100.0	83880 Nalorphine	60.0
83718 Lipoprotein high density cholesterol (HDL cholesterol) by precipitation method	BR	83885 Nickel, urine	100.0
83719 Lipoprotein very low density cholesterol (VLDL cholesterol) by ultracentrifugation	BR	83887 Nicotine	75.0
83720 Lipoprotein cholesterol fractionation calculation by formula	BR	83895 Nitrogen, urine, total, 24 hour specimen	60.0
83725 Lithium, blood, quantitative	60.0	83900 feces, 24 hour specimen	100.0
(Luteinizing hormone (LH), see 83002)		83910 Nonprotein nitrogen, blood	20.0
83727 Luteinizing releasing factor (LRH), RIA	60.0	(Norepinephrine, see 82382-82384)	
83728 Lysergic acid diethylamide (LSD) RIA	BR	83915 Nucleotidase 5'	25.0
83730 (Macroglobulins (sia test))	30.0	83916 Oligoclonal immune globulin (Ig), CSF, by electrophoresis	BR
		(For myelin basic protein, CSF, see 83873)	
		83917 Organic acids; screen, qualitative	30.0

	Unit Value		Unit Value	
83918	quantitative	30.0	84085 Phosphogluconate, 6-, dehydrogenase, RBC	18.0
83920	Ornithine carbonyl transferase, (OCT)	24.0	84087 Phosphohexose isomerase	30.0
83930	Osmolality, blood	20.0	84090 Phospholipids, blood	30.0
83935	urine	20.0	(See also 83705)	
83938	Ouabain	BR	(For lecithin/sphingomyelin ratio, see 83661)	
83945	Oxalate, urine	40.0	84100 Phosphorus, blood	°24.0
(For alpha oxoglutarate, see 82120)			84105 urine	°24.0
83946	Oxazepam	40.0	(Pituitary gonadotropins, see 83000-83002)	
83947	Oxybutyric acid, beta	40.0	(PKU, see 81005, 84030, 84031)	
83948	Oxycodone	52.0	84106 Porphobilinogen, urine; qualitative	20.0
(Oxygen, see gases, blood, 82790-82817)			84110 Porphobilinogen, urine, quantitative	20.0
83949	Oxytocinase, RIA	52.0	84118 Porphyrins, copro-, urine; quantitative	30.0
(Para-aminohippuric acid, see 82134)			84119 qualitative	24.0
83965	Paraldehyde, blood, quantitative	60.0	84120 Porphyrins, urine, fractionated (uroporphyrin and coproporphyrin)	64.0
83970	Parathormone (parathyroid hormone), RIA	165.0	84121 uro-, copro-, and porphobilinogen, urine	80.0
(PBI, see 83533)			(For porphyrin precursors, see 82630)	
83971	Penicillin, urine	50.0	84126 feces, quantitative	100.0
83972	Pentazocine	60.0	84128 Porphyrins, plasma	82.0
83973	Pentose, urine, qualitative	13.5	(For protoporphyrin, RBC, see 84202, 84203)	
(For TLC screen, see 84375)			84132 Potassium, blood	°24.0
83974	Pepsin, gastric	23.0	84133 urine	°24.0
83975	Pepsinogen, blood	40.0	84135 Pregnanediol; RIA	BR
83985	Pesticide, other than chlorinated hydrocarbons, blood, urine or other material	BR+	84136 other method (specify)	BR
(Pesticide, chlorinated hydrocarbons, see 82441)			84138 Pregnanetriol; RIA	BR
83986	pH, body fluid, except blood	BR	84139 other method (specify)	BR
(For blood, see 82800, 82802, 82803, 82817)			84141 Primidone	60.0
83992	Phencyclidine (PCP)	38.0	84142 Procainamide	60.0
83995	Phenol, blood or urine	60.0	84144 Progesterone, any method	105.0
84005	Phenolsulphonphthalein (PSP), urine	20.0	(For proinsulin, RIA, see 84206)	
(For injection procedure, see 36410 for provision of materials, see 99070)			84146 Prolactin (mammothropin), RIA	225.0
84021	Phenothiazine, urine	100.0	84147 Propoxyphene	60.0
(See also 82486 et seq.)			(For screen, see 82486 et seq.)	
84022	quantitative, chemical	BR	84149 Propranolol	BR
(For also individual drugs)			84150 Prostaglandin, any one, RIA	BR
84030	Phenylalanine, blood, Guthrie	12.0	84155 Protein, total, serum, chemical	°20.0
(Phenylalanine-tyrosine ratio, see 84030, 84510)			84160 refractometric	12.0
84031	fluorometric	12.0	84165 electrophoretic fractionation and quantitation	60.0
84033	Phenylbutazone	20.0	84170 total and albumin/globulin ratio	°40.0
84035	Phenylketones; blood, qualitative	20.0	(For serum albumin, see 82040, for serum globulin, 82942)	
84037	urine, qualitative	20.0	84175 other sources, quantitative	24.0
84038	Phenylpropanolamine	20.0	84176 Protein, special studies (e.g., monoclonal protein analysis)	BR
84039	Phenylpyruvic acid; blood	20.0	84180 urine, quantitative, 24 hour specimen	24.0
84040	Phenylpyruvic acid, urine	20.0	84185 Bence-Jones	12.0
(For qualitative chemical tests, urine, see 81005)			84190 electrophoretic fractionation and quantitation	80.0
84045	Phenytol	61.0	84195 spinal fluid semi-quantitative (Pandy)	20.0
84060	Phosphatase, acid, blood	24.0	84200 electrophoretic fractionation and quantitation	80.0
84065	(prostatic) fraction	40.0	(For protein bound iodine (PBI), see 83533)	
84066	prostatic fraction, RIA	60.0	84201 Protirelin, thyrotropin releasing hormone (TRH) test	BR
84075	alkaline, blood	24.0	84202 Protoporphyrin, RBC; quantitative	30.0
84078	heat stable (total not included)	16.0	84203 screen	20.0
84080	isoenzymes, electrophoretic method	BR	84205 Protiptylene	68.0
84081	Phosphatidylglycerol	BR	84206 Proinsulin, RIA	60.0
84082	Phosphates, tubular reabsorption of (TRP)	60.0	84207 Pyridoxine (Vitamin B-6)	BR
(Phosphates, inorganic, see 84100-84105)			84208 Pyrophosphate vs. urate, crystals (polarization)	12.0
(Phosphates, organic, see 82480-82484)			84210 Pyruvate, blood	30.0
84083	Phosphoglucomutase, isoenzymes	60.0	84220 Pyruvic-kinase, RBC	30.0
			84228 Quinine	30.0
			84230 Quinidine, blood	40.0
			84231 Radioimmunoassay (RIA) not elsewhere specified	BR

	Unit Value		Unit Value
(Reinsch test, see 83015)		84434 Thioridazine	40.0
84232 Releasing factor	BR	(Thyrotropin releasing hormone (TRH) test, see 84201)	
84233 Receptor assay; estrogen (estradiol)	BR	84435 Thyroxine, (T-4), CPB or resin uptake	33.0
84234 progesterone	BR	84436 Thyroxine, true (TT-4), RIA	21.0
84235 endocrine, other than estrogen or progesterone (specify hormone)	BR	84437 Thyroxine (T-4), neonatal	20.0
84236 progesterone and estrogen	BR	84439 Thyroxine, free (FT-4), RIA (unbound T-4 only)	45.0
84238 nonendocrine (e.g., acetylcholine) (specify recep- tor)	BR	(84441 Thyroxine (T-4) method unspecified has been deleted. To report, use 84435-84439)	
84244 Renin (Angiotensin I); (RIA)	60.0	84441 Thyroxine (T-4), specify method (e.g., CPB, RIA)	40.0
(See also 82163, angiotensin II)		84442 Thyroxine binding globulin (TBG)	52.0
84246 furosemide test	BR	(Thyroxine, free thyroxine index, T-7, see 82756)	
(84250, 84251 resine uptake have been deleted. To report, use 84479, 84435)		(Thyroid hormones, PBI, thyroxine, etc., see 84480, 84441, 84250)	
84252 Riboflavin (Vitamin B-2)	BR	84443 Thyroid stimulating hormone (TSH), RIA or EIA	60.0
(Salicylates, see 82011, 82012)		84444 Thyrotropin releasing factor (TRF), RIA;	BR
(Saline infusion test, see 82091)		84445 plus long acting (LATS)	BR
(Secretin test, see 99070, 89100 and appropriate analyses)		84446 Tocopherol alpha (Vitamin E)	38.0
84255 Selenium, blood, urine or tissue	100.0	(Tolbutamide tolerance, see 82951-82952)	
84260 Serotonin, blood	120.0	84447 Toxicology, screen; general	BR
(For urine metabolites, see 83497)		84448 sedative (acid and neutral drugs, volatiles)	45.0
84275 Sialic acid, blood	50.0	84450 Transaminase, blood, glutamic oxaloacetic (SGOT), timed kinetic ultraviolet method	24.0
(Sickle hemoglobin, see 83020, 83052, 83053, 85660)		°84455 colorimetric or fluorometric	°20.0
84285 Silica, blood, urine or tissue	100.0	84460 glutamic pyruvic (SGPT), blood timed kinetic ultraviolet	24.0
84295 Sodium, blood	°24.0	°84465 colorimetric or fluorometric	°20.0
84300 urine	°24.0	(Transferrin, see 86329)	
(Somatomammotropin, see 83632)		84472 Trichloroethanol	60.0
(Somatotropin, see 83003; chorionic, see 83632)		84474 Trichloroacetic acid	36.0
84310 Sorbitol dehydrogenase, serum	26.0	(Trichloroacetaldehyde, see 82400-82405)	
84315 specific gravity (except urine)	8.0	84476 Trifluoperazine	36.0
84317 Starch, feces, screening	8.0	84478 Triglycerides, blood	30.0
84318 Stercobilin, qualitative, feces	BR	(See also 83705)	
(For stone analysis see 82355-82370)		84479 Triiodothyronine (T-3), resin uptake	
84324 Strychnine	75.0	84480 Triiodothyronine, true (TT-3), RIA	36.0
(Sugar, see under glucose)		84481 Triiodothyronine, free (FT-3), RIA (unbound T-3 only)	BR
84375 sugars chromatographic separation	80.0	84483 Trimethadione	36.0
(Sulfhemoglobin, see hemoglobin, 83055-83060)		84485 Trypsin, duodenal fluid	30.0
(84382 has been deleted)		84488 Trypsin, feces, quantitative, 24 hour specimen	30.0
(For injection, see 36410, 99070)		84490 quantitative	30.0
84395 Sulfonamide, blood chemical	20.0	(Tubular reabsorption of phosphate, blood and urine, see 84082)	
(84397 has been deleted.)		84510 Tyrosin, blood	40.0
(T-3, see 84479-84481)		(Ultracentrifugation, lipoprotein, see 82190)	
(T-4, see 84435-84439)		(Urate vs. pyrophosphate crystals, see 84208)	
(84401 has been deleted.)		84520 Urea nitrogen, blood (BUN); quantitative	°22.0
84403 Testosterone, blood, RIA	105.0	84525 stick test	8.0
84405 Testosterone, urine, RIA	120.0	84540 urine	°20.0
84406 Testosterone, binding protein	BR	84545 clearance	°40.0
84407 Tetracaine	BR	84550 Uric acid, blood, chemical	°20.0
84408 Tetrahydrocannabinol THC (marijuana)	BR	84555 uricase, ultraviolet method	26.0
84409 Tetrahydrocortisone or tetrahydrocortisol	105.0	84560 urine	20.0
(See also 83492-83497)		84565 Urobilin, urine, qualitative	12.0
84410 Thallium, blood or urine	100.0	84570 quantitative, timed specimen	24.0
84420 Theophylline, blood or saliva	60.0	84575 feces, quantitative	60.0
84425 Thiamine (Vitamin B-1)	BR	84577 Urobilinogen, feces, quantitative	30.0
84430 Thiocyanate, blood	30.0	84578 Urobilinogen, urine, qualitative	24.0
		84580 quantitative, timed specimen	24.0
		84583 semiquantitative	20.0
		84584 Uropepsin, urine	24.0
		(Uroporphyrins, see 84120, 84121)	

	Unit Value		Unit Value
84585 Vanillylmandelic acid (VMA), urine	24.0	(Antiplasmin, see 85410)	
84588 Vasopressin (antidiuretic hormone), RIA	BR	(Antiprothrombinase, see 85311)	
84589 Viscosity, fluid	10.0	(Antithrombin III, see 85300)	
84590 Vitamin A, blood	40.0	(Basophil count, see 85005)	
84595 including carotene (see also 82380)	60.0		
(Vitamin B-1, see 84425)		85000 Bleeding time Duke	10.0
(Vitamin B-2, see 84252)		85002 Ivy or template	24.0
(Vitamin B-6, see 84207)		(85003 Adelson-Crosby immersion method has been deleted. To report, use 85999)	
(Vitamin B-12, blood, see 82606, 82607)		(Blood cell morphology only, see 85548)	
(Vitamin B-12, absorption (Schilling), see 78270, 78271)		85005 Blood count; basophil count, direct	10.0
(Vitamin C, see 82180)		85007 manual differential WBC count (includes RBC morphology and platelet estimation)	7.5
(Vitamin E, see 84446)		(See also 85548, 85585)	
84597 Vitamin K	BR	(For other fluids, e.g., CSF, see 89051, 89190)	
(VMA, see 84585)		85009 differential WBC count, buffy coat	12.0
84600 Volatiles (acetic anhydride, carbon tetrachloride, dichloroethane, dichloromethane, diethylether)	45.0	85012 eosinophil count, direct	10.0
(For acetaldehyde, see 82000)		(For nasal smear, see 89180)	
84605 Volume, blood, dye method (Evans blue)	30.0	85014 hematocrit	8.0
84610 including total plasma and total blood cell volume	50.0	85018 hemoglobin, colorimetric	8.0
(Volume, blood, RISA or Cr-51, see 78110, 78111)		(For other hemoglobin determination, see 83020-83068)	
84613 Warfarin	BR	85021 hemogram, automated RBC, WBC, Hgb, Hct and indices only)	10.5
84615 Xanthurenic acid	BR	85022 hemogram, automated, and manual differential WBC count (CBC)	15.0
84620 Xylose tolerance test, blood	40.0	85023 hemogram and platelet count, automated, and manual differential WBC count (CBC)	17.0
84630 Zinc, quantitative, blood	100.0	85024 hemogram and platelet count, automated, and automated partial differential WBC (CBC)	17.0
84635 urine	100.0	85025 hemogram and platelet count, automated, and automated complete differential WBC (CBC)	17.0
84645 Zinc sulphate turbidity	20.0	85027 hemogram, automated, with platelet count	12.0
(84680 has been deleted. To report use 82677)		(85028 has been deleted. To report, see 85023-85025)	
84681 C-peptide, any method	BR	85029 Additional automated hemogram indices (e.g., red cell distribution width (RDW), mean platelet volume (MPV), red blood cell histogram, platelet histogram, white blood cell histogram); one to three indices	BR
84695 Gentamicin	38.5	85030 four or more indices	BR
84702 Gonadotropin, chorionic; quantitative	30.0	85031 blood count; hemogram, manual, complete CBC (RBC, WBC, Hgb, Hct, differential and indices)	16.5
84703 qualitative	30.0	85041 red blood cell (RBC) only	8.0
84800 Thyroid stimulating hormone (TSH), neonatal	60.0	(See also 85021-85031, 89050)	
84810 Tobramycin	BR	85044 reticulocyte count	12.0
84999 Unlisted chemistry or toxicology procedure	BR	85048 white blood cell (WBC)	8.0
Note: Gas-liquid chromatography, paper chromatography, electrophoresis, nuclear medicine, enzyme immunoassay and radioimmunoassay techniques are being extended constantly for the analysis of many drugs, hormones and other substances. Where these methodologies are not specifically listed under the compound in question, such tests should be coded under the listing for the specific general methodology. (For immunodiffusion, immunoprecipitin, and counter-immunoelectrophoretic methods other than enzyme and radioimmunoassay techniques, see immunology section.)		(See also 85021-85034)	
[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-212, filed 7/23/87; 87-03-005 (Order 86-47), § 296-23-212, filed 1/8/87; 86-06-032 (Order 86-19), § 296-23-212, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-23-212, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-212, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-212, filed 12/23/80, effective 3/1/81; Order 74-7, § 296-23-212, filed 1/30/74.]		85095 Bone marrow smear and/or cell block; aspiration only	45.0
		(85096 has been deleted. For interpretation of smear, use 85097; for cell block interpretation, see 88304, 88305)	
		85100 Bone marrow, aspiration, staining, and interpretation of smears	140.0
		(For special stains, see 85535, 85540, 85560, 88312-88313)	
WAC 296-23-216 Hematology.		85101 aspiration and staining only (smears)	75.0
(Includes blood clotting (coagulation) procedures. For blood banking procedures, see under Immunology.)		85102 biopsy core (needle)	75.0
(Agglutinins, see Immunology)		(For trocar, see 20220)	
(Antifactor (specific coagulation factors), see 85300-85341)		85103 cell block or biopsy, stain and interpretation	60.0
		85109 staining and preparation only	30.0

	Unit Value		Unit Value
(85120 bone marrow transplant has been deleted. To report see 38230-38240)		85377 thrombin time dilution	36.0
85150 Calcium clotting time	40.0	85390 Fibrinolysins, screening	20.0
85160 Calcium saturation clotting test	40.0	85392 with EACA control	BR
85165 Capillary fragility test (Rumpel-Leede) (independent procedure)		85395 semi-quantitative	30.0
85170 Clot retraction	8.0	(85396 has been deleted, use 85999)	
85171 quantitative	45.0	85398 Fibrinolysis, quantitative	45.0
85172 inhibition by drugs	BR	85400 Fibrinolytic mechanisms, plasmin	BR
85175 Clot lysis time, whole blood dilution	40.0	85410 alpha-2 anti-plasmin	BR
(Clotting factor I (fibrinogen), see 82730, 85371-85377)		85420 plasminogen	BR
85210 factor II (prothrombin assay)	40.0	85421 plasminogen, antigenic assay	BR
(See also 85610-85618)		85426 von Willebrand factor assay	BR
85220 factor V (AcG or pro-accelerin) labile factor	40.0	(For plasminogen activator, see 85665)	
85230 factor VII (proconvertin stable factor)	40.0	(Fragility, red blood cell, see 85547, 85555-85557)	
85240 factor VIII (AHG) one stage	40.0	85441 Heinz bodies; direct	9.0
85242 factor VIII (AHG), two stage	40.0	85445 induced, acetyl phenylhydrazine	19.5
85244 factor VIII related antigen quantitation	BR	(For hematocrit (pcv), see 85014, 85021-85031)	
85250 factor IX (PTC or Christmas)	40.0	(For hemoglobin, see 83020-83060, 85050)	
85260 factor X (Stuart-Prower)	40.0	85460 Hemoglobin, fetal, differential lysis (Kleihauer)	26.0
85270 factor XI (PTA)	40.0	(See also 83030, 83033)	
85280 factor XII (Hagemann)	40.0	(Hemogram, see 85021-85031)	
85290 factor XIII (fibrin stabilizing)	40.0	(Hemolysins, see 86006, 86281, 86282)	
85291 factor XIII (fibrin stabilizing), screen solubility	40.0	85520 Heparin assay	60.0
85292 prekallikrein assay (Fletcher factor assay)	BR	85530 Heparin-protamine tolerance test	60.0
85293 high molecular weight kinninogen assay (Fitzgerald factor assay)	BR	85535 Iron stain (RBC or bone marrow smears)	18.0
85300 Clotting inhibitors or anti-coagulants, anti-thrombin	40.0	(Ivy bleeding time, see 85002)	
85301 antithrombin III, antigen assay	BR	85538 Leder stain (esterase) blood or bone marrow	30.0
85302 protein C assay	BR	85540 Leucocyte alkaline phosphatase	20.0
85310 anti-thromboplastins	40.0	85544 Lupus erythematosus (LE) cell prep	20.0
85311 anti-prothrombinase	40.0	(Lysozyme, see 85549)	
85320 anti-prothromboplastins	40.0	85547 Mechanical fragility, RBC	30.0
85330 anti-factor VIII	40.0	85548 Morphology of red blood cells, only	9.0
85340 cross recalcification time (mixtures)	40.0	85549 Muramidase, serum	52.0
85341 PTT inhibition test	BR	85550 Nitroblue tetrazolium test (NBT)	36.0
85345 Coagulation time (Lee and White)	30.0	85555 Osmotic fragility, RBC;	15.0
85347 Coagulation time, activated	20.0	85556 incubated, qualitative	18.0
85348 other methods	BR	85557 incubated, quantitative	60.0
(Complete blood count, see 85021-85031)		(Packed cell volume, see 85014)	
(Differential count, see 85007 et seq.)		(Partial thromboplastin time, see 85730-85732)	
(Drug inhibition, clot retraction, see 85172)		(Parasites, blood, e.g., malaria smears, see 87207)	
(Duke bleeding time, see 85000)		85560 Peroxidase stain, WBC	15.0
(Eosinophil count, direct, see 85012)		(Plasmin, see 85400)	
(Eosinophils, microscopic examination for, in various body fluids, see 89180)		(Plasminogen, see 85420)	
(Ethanol gel, see 85363)		(Plasminogen activator, see 85665)	
85360 Euglobulin lysis	40.0	85575 Platelet; adhesiveness (in vivo)	45.0
(Fetal hemoglobin, see 83030-83033, 85460)		85576 aggregation (in vitro), any agent	BR
85362 Fibrin degradation (split) products (FDP)(FSP); agglutination, slide	12.0	85577 retention (in vitro), glass bead	30.0
85363 ethanol gel	10.0	85580 Platelet, count (Rees-Ecker)	14.0
85364 hemagglutination inhibition (Merskey), microtiter	36.0	85585 estimation on smear, only	10.0
85365 immunoelectrophoresis	BR	(See also 85007)	
85367 precipitation	18.0	85590 phase microscopy	20.0
85368 protamine paracoagulation (PPP)	BR	85595 electronic technique	20.0
85369 staphylococcal clumping	12.0	85610 Prothrombin time	16.0
(Fibrinogen, quantitative, see 82730)		(See also 85618)	
85371 Fibrinogen, semiquantitative; latex	40.0	85612 Russell viper venom type (includes venom)	36.0
85372 turbidimetric	22.5	85614 two stage	30.0
85376 Fibrinogen; thrombin with plasma dilution	24.0	85615 Prothrombin utilization (consumption)	40.0
		85618 Prothrombin-Proconvertin, P & P (Owren)	18.0

	Unit Value		Unit Value
(Red blood cell count, see 85021-85031)		(Agglutinins, cold, see 86006, 86013, 86282, 86283)	
85630 Red blood cell size (Price-Jones)	40.0	(Alpha-1 antitrypsin, see 86329)	
85632 Red blood cell peroxide hemolysis	30.0	(Alpha-1 fetoprotein, see 86329)	
85635 Reptilase test	33.0	(Amebiasis, see 86171, 86280)	
(Reticulocyte count, see 85044)		86006 Antibody, qualitative, not otherwise specified; first antigen, slide or tube	12.0
(Rumpel-Leede test, see 85165)		86007 each additional antigen	7.5
85640 Reticulocyte count	14.0	86008 Antibody, quantitative titer, not otherwise specified; first antigen	18.0
85650 Sedimentation rate (esr) Wintrobe type	14.0	86009 each additional antigen	12.0
85651 Westergren type	10.5	86011 Antibody, detection, leukocyte antibody	44.0
85660 Sickling of red blood cells reduction slide method	14.0	86012 Antibody absorption, cold auto absorption; per serum	30.0
(Sickling, electrophoresis, see 83020)		(For elution, see 86019)	
(Sickling, solubility, S-D, see 83053)		86013 differential	45.0
(Sickling, turbidimetric (Sickledex dithionate), see 83052)		86014 Antibody, platelet antibodies (agglutinins)	45.0
(Siderocytes, see 85535)		86016 Antibodies, RBC, saline; high protein and antihuman globulin technique	30.0
(Smears for parasites, malaria, etc., see 87207)		(See also 86032)	
(Staphylococcal clumping test, see 85369)		86017 with ABO + Rh(D) typing (for holding blood instead of complete crossmatch)	24.0
85665 Streptokinase titer (plasminogen activator)	BR	86018 enzyme technique including antihuman globulin	17.0
85670 Thrombin time, plasma	20.0	86019 elution, any method	45.0
85675 titer	12.0	86021 Antibody identification; leukocyte antibodies	60.0
85680 Thrombo test	20.0	86022 platelet antibodies	75.0
85700 Thromboplastin generation test, screening (Hicks-Pitney)	40.0	86024 RBC antibodies (8-10 cell panel) standard techniques	38.0
85710 definitive, with platelet substitute	45.0	86026 RBC antibodies (8-10 cell panel), with enzyme technique including antihuman globulin	52.0
85711 with patient's platelets	45.0	(For absorption and elution, see 86012-86013, 86019)	
85720 all factors	BR+	86028 saline or high protein, each (Rh, AB, etc.)	12.0
(For individual clotting factors, see 85210 et seq.)		(Anti-DNA, see 86225)	
85730 Thromboplastin time, partial (PTT) plasma or whole blood	30.0	(Anti-deoxyribonuclease titer, see 86215)	
85732 substitution plasma	30.0	86031 Antihuman globulin test; direct (Coombs) 1-3 dilutions	12.0
(For thromboplastin inhibition test, see 85341)		86032 indirect, qualitative (broad, gamma or nongamma, each)	15.0
(For tourniquet test, see 85165)		86033 indirect, titer (broad, gamma or nongamma each)	12.0
85810 Viscosity, blood	40.0	86034 enzyme technique, qualitative	30.0
85820 serum or plasma	40.0	86035 drug sensitization, identification (e.g., penicillin)	75.0
(WBC count, see 85021-85031, 85048, 89050)		(For antibody detection (screening), see 86016, 86017)	
85999 Unlisted hematology procedure	BR	(Antihyaluronidase titer, see 86315)	
[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-216, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-216, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-216, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-216, filed 12/23/80, effective 3/1/81; Order 74-7, § 296-23-216, filed 1/30/74. Formerly WAC 296-23-210.]		86038 Antinuclear antibodies (ANA), RIA	55.0
WAC 296-23-221 Immunology.		(Antinuclear antibodies, fluorescent technique, see 86255, 86256)	
(Includes serology, immuno-hematology and blood banking)		86045 Antistreptococcal carbohydrate, anti-A CHO	40.0
(Acid hemolysins, see 86281)		(Antistreptococcal antibody, anti-DNAse, see 86215)	
(Actinomycosis, see 86000-86009, 86450)		(Antistreptokinase titer, see 86590)	
	Unit Value	86060 Anti-streptolysin O titre	20.0
86000 Agglutinins febrile, each	14.0	86063 screen	10.0
86002 panel (typhoid O & H, paratyphoid A & B, brucella and Proteus OX-19)	45.0	86064 Antitrypsin, alpha-1; RIA	20.0
86004 warm	36.0	86066 Pi (Protease inhibitor) typing	20.0
(Agglutinins and autohemolysins, see 86004, 86011-86013, 86281-86283, 86006-86009)		86067 other method (specify)	20.0
(Agglutinins, auto, see 86282-86283, 86011, 86013)		(Autoagglutinins, see 86282, 86283)	
		(Autoantibodies, see specific antigens)	
		(Blastomycosis, see 86006-86009, 86460)	
		86068 Blood, cross match, complete standard technique, includes typing and antibody screening of recipient and donor; first unit	60.0

	Unit Value		Unit Value
86069	each additional unit	45.0	
86072	Blood crossmatch; enzyme technique	10.5	
86073	screening for compatible unit saline and/or high protein	26.0	
86074	antiglobulin technique	15.0	
(For enzyme technique, see 86018)			
86075	Blood crossmatch, minor only (plasma, Rh immune globulin), includes recipient and donor typing and antibody screening; first unit	44.0	
86076	each additional unit	27.0	
(For incompatibility problems, see 86004, 86011-86014, 86016-86026, 86031-86035, 86068-86076)			
(For typing, antibody screening and blood in lieu of crossmatch, see 86017)			
(For blood transfusion, see 36430-36460, 36510, 36660)			
86080	Blood typing; ABO only	12.0	
86082	ABO and Rho(D)	18.0	
86090	M N	20.0	
86095	Blood typing, RBC antigens other than ABO or Rho(D); antiglobulin technique, each antigen	10.5	
86096	direct, slide or tube, including Rh subtypes, each antigen	10.5	
86100	Blood typing; Rho(D) only	12.0	
86105	Rh genotyping, complete	45.0	
(For Rho variant Du, see 86095)			
86115	anti-Rh immuno-globulin testing (Rhogam type)	68.0	
86120	special (Kell, Duffy, etc.)	BR	
86128	Blood autotransfusion, including collection, processing and storage	45.0	
(For therapeutic phlebotomy, see 99195)			
(86129, 86131, 86134, 86138, and 86139 have been deleted)			
(Bovine milk antibody, see 86008, 86009)			
(Brucellosis, see 86000-86002, 86470)			
86140	C-reactive protein	20.0	
(Candidiasis, see 86008)			
86149	Carcinoembryonic antigen; gel diffusion	60.0	
86151	RIA or EIA	60.0	
(Cat scratch disease, see 86171, 86480)			
86155	Chemotaxis assay, specify method	BR	
(Coccidioidomycosis, see 86006-86009, 86171, 86490)			
(Cold agglutinin or hemolysin, see 86006-86013, 86282, 86283)			
86158	Complement; C'1 esterase	52.0	
86159	C'2 esterase	52.0	
86162	total (CH 50)	70.0	
86163	C's esterase	BR	
86164	C'4 esterase	BR	
(For complement fractions, quantitative, see 86329)			
86171	Complement fixation tests, each (e.g., cat scratch fever, coccidioidomycosis, histoplasmosis, psittacosis, rubella, streptococcus MG, syphilis) - specify test	40.0	
(Coombs test, see 86031-86035)			
86185	Counterelectrophoresis, each antigen	24.0	
(For HAA, see 86285, 86286)			
(Crossmatch, see 86068-86076)			
(86201 and 86202 have been deleted)			
(Cryptococcosis, see 86008, 86009, 86255, 86256)			
(Cysticercosis, see 86280)			
86215	Deoxyribonuclease, antibody	36.0	
86225	Deoxyribonucleic acid (DNA) antibody	36.0	
(Diphtheria, see 86280)			
(Direct antiglobulin test (Coombs), see 86031)			
(Donath-Landsteiner screen, see 86008, 86009)			
(Drug sensitization, RBC, see 86035)			
(Echinococcosis, see 86171, 86280, 86500)			
86227	Enzyme immunoassay for infectious agent antigen	BR	
(For precipitin or agglutination rapid test for infectious agent, use 86403)			
(For enzyme immunoassay for drugs, use 82662)			
86228	Enzyme immunoassay for infectious agent antibody	BR	
(For HTLV-III antibody tests, see 86312-86314)			
86229	Enzyme immunoassay for chemical constituent	BR	
(Eosinophils, nasal smear, use 89190)			
86235	Antibody to specific nuclear antigen, any method, each	30.0	
(86240 and 86241 have been deleted)			
86243	Fc receptor assay, specify method	BR	
86244	Feto-protein, alpha-1, RIA or EIA	57.0	
(86245 has been deleted)			
(Filariasis, see 86280)			
86255	Fluorescent antibody; screen	24.0	
86256	titer	36.0	
(Fluorescent technique for antigen identification in tissue, see 88346)			
86265	Frozen blood, preparation for freezing, each unit including processing and collection;	BR	
86266	with thawing	BR	
86267	with freezing and thawing	BR	
(FTA, see 86650)			
(Gc grouping, see 86335)			
(Gel (agar) diffusion tests, see 86331)			
(Gm grouping, see 86335)			
(Gonadotropins, chorionic, see 82996-82998)			
(86272 and 86273 have been deleted)			
(86274 has been deleted. For passive immunization with specific hyperimmune serum, see 90742)			
(Gm grouping, see 86335)			
(Gonadotropins, chorionic, see 82996-82998)			
86277	Growth hormone, human (HGH), antibody, RIA	BR	
(HAA, see 86285-86287)			
(Ham test, see 86281)			
86280	Hemagglutination inhibition tests (HAI), each (e.g., amebiasis, rubella, viral)	60.0	
86281	Hemolysins, acid (for paroxysmal hemoglobinuria) (Ham test)	24.0	
86282	Hemolysins and agglutinins, auto, screen, each;	30.0	
86283	incubated with glucose (e.g., ATP)	75.0	
(Cold, see 86006-86009, warm 86004, acid 86281)			
86285	Hepatitis B surface antigen (HB _s Ag) (Australian antigen, HAA); counterelectrophoresis method	18.0	

	Unit Value		Unit Value
86286		counterelectrophoresis with concentration of serum	
86287	24.0	RIA or EIA	36.0
(For gel diffusion technique, see 86331; CF, see 86171; HAI, see 86280)			
86288	BR	Hepatitis B core antigen (HB _c Ag), RIA	
86289	BR	Hepatitis B core antibody (HB _c Ab), RIA or EIA	
86290	BR	IgM antibody (e.g., RIA, EIA, RPHA)	
86291	BR	Hepatitis B surface antibody (HB _s Ab), (e.g., RIA, EIA, RPHA)	
86293	BR	Hepatitis Be antigen (HB _e Ag), (e.g., RIA, EIA)	
86295	BR	Hepatitis Be antibody (HB _e Ab), (e.g., RIA, EIA)	
86296	BR	Hepatitis A antibody (HAAb), (e.g., RIA, EIA)	
(86297 Hepatitis A virus antibody has been deleted. To report, use 86296)			
86298	BR	IgG antibody	
86299	BR	IgM antibody	
86300		Heterophile antibodies, screening (includes monotype test) slide or tube	20.0
86305	30.0	quantitative titer	
86310	30.0	plus titers after absorption, beef cells and guinea pig kidney	
(Histoplasmosis, see 86006-86009, 86171)			
(HLA typing, see 86597)			
(For hormones, see individual alphabetic listing in chemistry section)			
86312	BR	HTLV-III antibody detection; ELISA	
86314	BR	confirmatory test (e.g., Western blot)	
(Human growth hormone antibody, RIA, see 86277)			
(86315 has been deleted)			
86320	100.0	Immuno-electrophoresis, serum, each specimen (plate)	
86325	100.0	other fluids (e.g., urine) with concentration, each specimen	
86327	BR	crossed (2 dimensional assay)	
86329	30.0	Immunodiffusion; quantitative, each IgA, IgG, IgM, ceruloplasmin, transferrin, alpha-2, macroglobulin, complement fractions, alpha-1 antitrypsin, or other (specify)	
86331	30.0	gel diffusion, qualitative (Ouchterlony)	
(For ceruloplasmin by chemical method, see 83290)			
(IgE, RIA, see 82785; RIST, see 86423)			
86335	BR	Immunoglobulin typing (Gc, Gm, Inv), each	
(Insulin antibody, see 86016)			
86337	BR	Insulin antibodies, RIA	
86338	32.0	Insulin factor antibodies, RIA	
86340	32.0	Intrinsic factor antibodies, RIA	
(Intrinsic factor, antibody (fluorescent), see 86255, 86256)			
(Inv grouping, see 86335)			
(Latex fixation, see individual antigen or antibody; also 86006, 86007)			
(LE cell preparation, see 85544)			
(LE factor, see 86006, 86007, 86255, 86256)			
(Leishmaniasis, see 86280)			
(Leptospirosis, see 86006-86009, 86171)			
(Leukoagglutinins, see 86013, 86021)			
86343	BR	Leukocyte histamine release test (LHR)	
86344	BR	Leukocyte phagocytosis	
(86345, 86346, and 86347 have been deleted)			
86349		Leukocyte transfusion (leukapheresis)	BR
(Lymphocyte culture, see 86353)			
(86351 has been deleted)			
86353	120.0	Lymphocyte transformation, PHA or other	
86357	165.0	Lymphocytes; T & B differentiation	
86358	BR	B-cell evaluation	
(Malaria, see 87207)			
(86365 has been deleted)			
(Meliodosis, see 86280)			
86376	BR	Microsomal antibody (thyroid); RIA	
86377	30.0	other method (specify)	
86378	BR	Migration inhibitory factor test (MIF)	
(Milk antibody, anti-bovine, see 86008-86009)			
(Mitochondrial antibody, liver, see 86255)			
(Mononucleosis screening slide, see 86006-86007)			
86382	BR	Neutralization test, viral	
86384	BR	Nitroblue tetrazolium dye test (NTD)	
(Ouchterlony diffusion, see 86331)			
(Parietal cell antibody, see 86255, 86256)			
86385	37.5	Paternity testing, ABO + Rh factors + MN (per individual);	
86386	15.0	each additional antigen system	
(Penicillin antibody RBC, see 86035)			
(86388, 86389, and 86391 have been deleted)			
(Platelet antibodies (agglutinins), see 86014)			
(86392, 86393, and 86398 have been deleted)			
86402		Precipitin determination, gel diffusion, in aspergillosis, bagassosis, farmer lung, pigeon breeder disease, silo filler disease, other alveolitis (specify)	BR
86403		Precipitin (e.g., latex bead) or agglutination rapid test for infectious agent antigen	BR
86405		Precipitin test for blood (species identification)	BR
(Pregnancy test, see 82996, 82997, 86006-86009)			
(86415 and 86416 have been deleted)			
(Psittacosis, CF, see 86171)			
86421	BR	Radioallergosorbent test (RAST); up to 5 antigens	
86422	BR	6 or more antigens	
86423	BR	Radioimmunosorbent test (RIST) IgE, quantitative	
(Rapid plasma reagin test (RPR), see 86592)			
(86424, 86425, 86426, and 86427 have been deleted)			
86430	12.0	(Rheumatoid factor)	
(RIST, see 86423)			
(RPR, see 86592)			
(Rubella, CF, see 86171; HAI, see 86280)			
(Schistosomiasis agglutination, see 86006-86009)			
(Serologic test for syphilis (STS), see 86171, 86592, 86593)			
86455		Skin test; energy testing, one or more antigens	
86490	20.0	coccidioidomycosis	
86510	20.0	histoplasmosis	
86540	20.0	mumps	
86580	20.0	tuberculosis, intradermal	
86585	12.0	tuberculosis, tine test	

	Unit Value
(Skin tests 86450, 86460, 86470, 86480, 86495, 86500, 86520, 86530, 86550, 86565, and 86570 have been deleted)	
(For skin tests for allergy testing, see 95005-95199, medicine section)	
(Smooth muscle antibody, see 86255, 86256)	
(Sporotrichosis, see 86006-86009)	
(Streptococcus MG, see 86171)	
86590 Streptokinase, antibody	27.0
(Streptolysis O antibody, see anti-streptolysis O, 86060-86061)	
(Streptobacillus, see 86008, 86009)	
86592 Syphilis, precipitation or flocculation tests, qualitative VDRL, RPR, ART	9.0
(See also 89006, 89007)	
86593 Syphilis, precipitation or flocculation tests, quantitative	15.0
(Syphilis serology, see also 86171)	
(Tetanus, see 86280)	
(Thyroglobulin antibody, see 86006-86009, 86171)	
(Thyroglobulin antibody, RIA, see 86800)	
86594 Thyroid autoantibodies	BR
86595 Tissue; culture	BR
(86597 tissue typing has been deleted. To report, use 86810-86822)	
86600 Toxoplasmosis dye test	80.0
(For CF, see 86171; IFA, see 86255, 86256)	
86630 Transfer factor test (TFT)	BR
86650 Treponema antibodies, fluorescent, absorbed (FTA-abs)	30.0
86660 Treponema pallidum immobilization (TPI)	80.0
86662 Treponema pallidum test, other, specify (e.g., TPIA, TPA, TPMB, TPCF, RPCF)	BR
(Trichinosis, see 86006-86009)	
(Trypanosomiasis, see 86171, 86280)	
(Tuberculosis, see 86580, 86585, 87116-87118, 87190)	
(Vaccinia immune globulin, see 86274)	
(VDRL, see 86592, 86593)	
(Viral antibodies, see 86171, 86280, 86382)	
(Visceral larval migrans, see 86280)	
(Warm agglutinins, see 86004)	
(86670 has been deleted)	
86681 Adrenal cortex antibodies, RIA	31.0
86685 Anti-AChR (acetylcholine receptor) antibody titer	BR
86800 Thyroglobulin antibody, RIA	31.0
86810 Tissue typing; for organ transplantation, including pretransplant crossmatch (donor lymphocyte vs recipient serum for nonspecific antibodies)	BR
86812 HLA typing, A, B, or C (e.g., A10, B7, B27), single antigen	BR
86813 HLA typing, A, B, and/or C (e.g., A10, B7, B27), multiple antigens	BR
86816 HLA typing, DR, single antigen	BR
86817 HLA typing, DR, multiple antigen	BR
86821 Lymphocyte culture, mixed (MLC)	BR
86822 Lymphocyte culture, primed (PLC)	BR
86800	BR
86999 Unlisted immunology procedure	BR

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-221, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-221, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-23-221, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-221, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-221, filed 12/23/80, effective 3/1/81; Order 74-7, § 296-23-221, filed 1/30/74.]

WAC 296-23-224 Microbiology.

	Unit Value
(Includes bacteriology, mycology, parasitology and virology)	
87001 Animal inoculation, small animal; with observation	36.0
87003 with observation and dissection	45.0
87015 concentration (any type) for parasites, ova or tubercle bacillus (T.B. AFB)	20.0
87040 Culture, bacterial, definitive aerobic; blood (may include anaerobic screen)	48.0
87045 stool	25.0
87060 throat or nose	20.0
87070 any other source	16.0
(For urine, see 87086-87088)	
87072 Culture, presumptive, pathogenic organisms, by commercial kit, any source except urine (For urine, see 87087)	BR
87075 Culture, bacterial, any source; anaerobic (isolation)	36.0
87076 definitive identification, including gas chromatography in addition to anaerobic culture	60.0
87081 Culture, bacterial, screening only, for single organisms	15.0
87082 Culture, presumptive, pathogenic organisms, screening only, by commercial kit (specify type); for single organisms	BR
87083 multiple organisms	BR
87084 with colony estimation from density chart (includes throat cultures)	BR
87085 with colony count	BR
(For urine colony count, see 87086)	
87086 Culture, bacterial, urine; quantitative, colony count	15.0
87087 commercial kit	12.0
87088 identification, in addition to quantitative or commercial kit	12.0
87101 Culture, fungi, isolation; skin	15.0
87102 other source	18.0
87106 definitive identification, by culture, per organism, in addition to skin or other source	30.0
87109 Culture, mycoplasma, any source	75.0
87116 Culture, tubercle or other acid-fast bacilli (e.g., TB, AFB, mycobacteria); any source, isolation only	18.0
87117 concentration plus isolation	30.0
87118 definitive identification, per organism, (does not include isolation and/or concentration)	30.0
87140 culture, typing fluorescent method each antiserum	20.0
87143 gas liquid chromatography (GLC) method	45.0
87145 phage method	40.0
87147 serological method agglutination grouping, per antiserum	20.0
87151 serologic method, speciation	20.0
87155 precipitin method, grouping, per antiserum	12.0
87158 other methods	20.0
87163 Culture, special extensive definitive diagnostic studies, beyond usual definitive studies	25.0
87164 Dark field examination, any source (e.g., penile, vaginal, oral, skin); includes specimen collection	60.0
87166 without collection	30.0
87173 Endotoxin, bacterial (pyrogens); animal inoculation	36.0
87174 chemical	24.0
87176 homogenization, tissue, for culture	15.0
87177 Ova and parasites, direct smears, concentration and identification	36.0

	Unit Value
(Individual smears and procedures, see 87015, 87208-87211)	
(Trichrome, iron hemotoxylin and other special stains, see 88312)	
87181 Sensitivity studies antibiotic, agar diffusion method, per antibiotic	40.0
87184 disc method, per plate (12 or less discs)	24.0
87186 microtiter, minimum inhibitory concentration (MIC), any number of antibiotics	45.0
87188 tube dilution method, each antibiotic	30.0
87190 Sensitivity study of tubercle bacillus, (TB, AFB), each drug	60.0
87205 Smear, primary source, with interpretation; routine stain for bacteria, fungi, or cell types	12.0
87206 fluorescent and/or acid fast stain for bacteria, fungi, or cell types	18.0
87207 special stain for inclusion bodies or intracellular parasites (e.g., malaria, kala azar, herpes)	24.0
87208 direct or concentrated, dry, for ova and parasites	12.0
(For concentration, see 87015; complete examination, see 87177)	
(For complex special stains, see 88312-88313)	
(For fat, meat, fibers, nasal eosinophils, and starch, see miscellaneous section)	
87210 wet mount with simple stain, for bacteria, fungi, ova, and/or parasites	12.0
87211 wet and dry mount, for ova and parasites	18.0
87220 Tissue examination for fungi (e.g., KOH slide)	BR
87250 Virus, inoculation of embryonated eggs, suitable tissue culture, or small animal, includes observation and dissection	12.0
(For electron microscopy, see 88348)	
(For inclusion bodies in tissue sections, see 88304-88309; in smears, see 87207-87210; in fluids, see 88106)	
(87300 autogenous vaccine has been deleted. To report, use 87999.)	
87999 Unlisted microbiology procedure	BR

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-224, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-224, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-224, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-224, filed 12/23/80, effective 3/1/81; Order 74-7, § 296-23-224, filed 1/30/74. Formerly WAC 296-23-205.]

WAC 296-23-228 Anatomic pathology.

	Unit Value
POSTMORTEM EXAMINATION	
(Procedures 88000 through 88099 represent physician services only. See modifier -90 for outside laboratory services.)	
88000 Necropsy (autopsy) without CNS, gross examination only	400.0
88005 with brain	500.0
88007 with brain and spinal cord	600.0
88012 infant with brain	300.0
88014 stillborn or newborn with brain	300.0
88016 macerated stillborn	400.0
88020 Necropsy (autopsy) without CNS, gross and microscopic examination	800.0
88025 with brain	900.0
88027 with brain and spinal cord	1000.0
88028 infant with brain	700.0
88029 stillborn or newborn with brain	700.0

88036 Necropsy (autopsy), limited, gross and/or microscopic; regional	BR
88037 single organ	BR+
88040 Necropsy (autopsy); forensic examination	BR
88045 coroner's call	BR
88099 Unlisted necropsy (autopsy) procedure	BR

CYTOPATHOLOGY

88104 Cytopathology, fluids, washings or brushings, with centrifugation except cervical or vaginal; smears with interpretation	45.0
88106 filter method only with interpretation	45.0
88107 smears and filter preparation with interpretation	60.0
88108 concentration technique, smears and interpretation (e.g., Saccomanno technique)	BR

(88109 has been deleted. For interpretation of smear, use 88104; for cell block interpretation, see 88304, 88305)

(For cervical or vaginal smears, see 88150)

(For gastric intubation with lavage, see 89130-89141, 91055)

(For x-ray localization, see 74340)

88125 Cytopathology, forensic (e.g., sperm)	75.0
88130 Sex chromatin identification; (Barr bodies)	40.0
88140 peripheral blood smear, polymorphonuclear "drum sticks"	40.0

(For guard stain, see 88313)

88150 Cytopathology, smears, cervical or vaginal (e.g., Papanicolaou), screening by technician under physician supervision, up to three smears;	BR
88151 requiring interpretation by physician	BR
88155 with definitive hormonal evaluation (e.g., maturation index, karyopyknotic index, estrogenic index)	40.0
88160 Cytopathology, any other source (e.g., sputum), screening and interpretation	36.0
88161 preparation, screening and interpretation	BR
88162 extended study involving over 5 slides and/or multiple stains	BR

(For obtaining specimen, see percutaneous needle biopsy under individual organ in surgery)

(For aerosol collection of sputum, see 89350)

(For special stains, see 88312, 88313)

88170 Fine needle aspiration with or without preparation of smears; superficial tissue (e.g., thyroid, breast, prostate)	BR
88171 deep tissue under radiologic guidance	BR

(For CT guidance, see 76360, 76361; for ultrasonic guidance, see 76942, 76943; for fluoroscopic guidance use 76000)

88172 Evaluation of fine needle aspirate with or without preparation of smears; immediate cytohistologic study to determine adequacy of specimen(s)	BR
88173 interpretation and report	BR
88180 Flow cytometry; each cell surface marker	BR
88182 cell cycle or DNA analysis	BR
88199 Unlisted cytopathology procedure	BR

(For electron microscopy, see 88348, 88349)

CYTOGENETIC STUDIES

88260 Chromosome analysis; lymphocytes, count 1-4 cells, screening	180.0
88261 count 1-4 cells, 1 karyotype	375.0
88262 count 1-20 cells for mosaicism, 2 karyotypes	525.0
88265 Chromosome analysis; myeloid cells, 2 karyotypes (Philadelphia chromosome)	225.0
88267 amniotic fluid, count 1-4 cells, 1 karyotype	600.0

	Unit Value
88268 skin, count 1-4 cells, 1 karyotype	600.0
88270 other tissue cells, count 1-4 cells, 1 karyotype ...	BR
88280 additional karyotyping, each study	75.0
88285 additional cells counted, each study	15.0
88299 Unlisted cytogenetic study	BR

SURGICAL PATHOLOGY

(Procedures 88300 through 88399 include accession, handling and reporting)

88300 Surgical pathology, gross examination only	20.0
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NOTE: Only one of the numbers 88302-88309 should be used in reporting specimens (single or multiple) that are removed during a single surgical procedure.

88302 Surgical pathology, gross and microscopic examination of presumptively normal tissue(s), for identification and record purposes	60.0
88304 Surgical pathology, gross and microscopic examination of presumptively abnormal tissue(s); uncomplicated specimen	75.0
88305 single complicated or multiple uncomplicated specimen(s), without complex dissection	105.0
88307 single complicated specimen requiring complex dissection or multiple complicated specimens	150.0
88309 complex diagnostic problem with or without extensive dissection	BR

(For fine needle aspiration, preparation, and interpretation of smears, see 88170-88173)

88311 decalcification procedure. (List separately in addition to code for surgical pathology examination)	12.0
88312 Special stains (list separately in addition to code for surgical pathology examination); Group I for microorganisms, (e.g., Gridley, acid fast, methenamine silver), each	25.0
88313 Group II, all other (e.g., iron, trichrome), except immunocytochemistry and immunoperoxidase stains, each	12.0

(For immunocytochemistry and immunoperoxidase tissue studies, use 88342)

88314 Histochemical staining with frozen section(s)	BR
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(88316 preparation of duplicate slides has been deleted. To report, use 99070)

88318 Determinative histochemistry to identify chemical components (e.g., copper, zinc)	BR
88319 Determinative histochemistry or cytochemistry to identify enzyme constituents, each	BR
88323 Consultation and report on referred material requiring preparation of slides	BR
88331 with frozen section(s), single specimen	90.0
88332 each additional tissue block with frozen section(s)	30.0
88342 Immunocytochemistry (including tissue immunoperoxidase), each antibody	BR

(88345 has been deleted. To report, use 88346)

88346 Immunofluorescent study, each antibody	BR
88348 Electron microscopy; diagnostic	BR
88349 scanning	BR
88350 Morphometric analysis; skeletal muscle	BR
88356 nerve	BR

(88360 whole organ sections has been deleted. To report use 88399)

(88370 has been deleted. To report, use 88342)

	Unit Value
(For physician interpretation of peripheral blood smear, use 85060)	
88399 Unlisted surgical pathology procedure	BR

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-228, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-228, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-23-228, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-228, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-228, filed 12/23/80, effective 3/1/81; Order 74-7, § 296-23-228, filed 1/30/74. Formerly WAC 296-23-240.]

WAC 296-23-232 Miscellaneous.

	Unit Value
(Basal metabolic rate has been deleted. If necessary to report, use 89399)	
(89005-89007 have been deleted)	
89050 Cell count, miscellaneous body fluids (except blood) (e.g., CSF, joint fluid, etc.)	12.0
89051 with differential count	20.0
89060 Crystal identification by compensated polarizing lens analysis, synovial fluid	BR
(89070 has been deleted)	
(89080 has been deleted)	
89100 Duodenal intubation and aspiration single specimen (e.g., simple bile study or afferent loop culture) plus appropriate test procedure	40.0
89105 collection of multiple fractional specimens, with pancreatic or gallbladder stimulation, single or double lumen tube	BR
(For chemical analyses, see Chemistry and Toxicology)	
(For electrocardiogram, see 93000-93279)	
(For radiological localization, see 74340)	
(Esophagus acid perfusion test (Bernstein), see 91030)	
89125 Fat stain, feces, urine, sputum	15.0
89130 Gastric intubation and aspiration diagnostic, each specimen, for chemical analyses or cytopathology; ..	20.0
89132 after stimulation	45.0
89135 Gastric intubation, aspiration, and fractional collections; for one hour (e.g., gastric secretory study) ...	60.0
89136 two hours	90.0
89140 two hours including gastric stimulation (e.g., histalog, pentagastrin)	105.0
89141 three hours, including gastric stimulation	120.0
(For gastric lavage, therapeutic, see 96150)	
(For radiologic localization of gastric tube, see 74340)	
(For chemical analyses, see 82926-82932)	
(For joint fluid chemistry, see Chemistry and Toxicology, this section)	
89160 Meat fibers, feces	12.0
(89180 has been deleted. To report, use 89190)	
89190 Nasal smear for eosinophils	
89205 Occult blood, any source except feces	10.5
(Occult blood, feces, see 82270)	
(Paternity tests, see 86385, 86386)	
(89210 has been deleted)	
89300 Semen analysis, presence and/or sperm motility including Huhner test	12.0

	Unit Value
89310 motility and count	40.0
89320 complete (volume, count, motility and differential)	80.0
(For skin test, see 86455-86585 and 95005-95199)	
89325 Sperm evaluation; hamster penetration test	BR
(For medicolegal identification of sperm, see 88125)	
89330 cervical mucus penetration test, with or without spinn barkeit test	BR
(For complete spinal fluid examination, see 89070)	
(89345 has been deleted)	
89350 Sputum, obtaining specimen, aerosol induced technique (separate procedure)	20.0
89355 Starch granules, feces	10.5
(For chloride and sodium analysis, see 82437, 84295)	
(Tissue culture, see 86595)	
(Tissue typing, see 86810-86822)	
89365 Water load test	BR
89399 Unlisted miscellaneous pathology test	BR

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-232, filed 7/23/87; 86-06-032 (Order 86-19), § 296-23-232, filed 2/28/86, effective 4/1/86. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-232, filed 12/23/80, effective 3/1/81; Order 74-7, § 296-23-232, filed 1/30/74.]

HOSPITAL

WAC 296-23-300 Repealed. See Disposition Table at beginning of this chapter.

HOSPITAL RULES

WAC 296-23-301 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-23-305 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-23-310 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-23-315 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-23-330 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-23-335 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-23-340 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-23-356 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-23-357 Repealed. See Disposition Table at beginning of this chapter.

MISCELLANEOUS SERVICES AND APPLIANCES

WAC 296-23-500 Miscellaneous services and appliances. (1) The department or self-insurer will reimburse for certain medically necessary miscellaneous services and items needed as a result of an industrial accident. Nursing care, attendant care, transportation, hearing aids, eyeglasses, orthotics and prosthetics, braces, medical supplies, oxygen systems, walking aids, and durable medical equipment are included in this classification.

(a) When a fee maximum has been established, the rate of reimbursement for miscellaneous services and items will be the supplier's usual and customary charge or the department's current fee maximum, whichever is less. In no case may a supplier or provider charge a claimant the difference between the fee maximum and their usual and customary charge.

(b) When the department or self-insurer has established a purchasing contract with a qualified supplier through an open competitive request for proposal process, the department or self-insurer will require that claimants obtain specific groups of items from the contractor. When items are obtained from a contractor, the contractor will be paid at the rates established in the contract. When a purchasing contract for a selected group of items exists, suppliers who are not named in the contract will be denied reimbursement if they provide a contracted item to a claimant. The noncontracting supplier, not the claimant, will be financially responsible for providing an item to a claimant when it should have been supplied by a contractor. This rule may be waived by an authorized representative of the department or self-insurer in special cases where a claimant's attending doctor recommends that an item be obtained from another source for medical reasons or reasons of availability. In such cases, the department may authorize reimbursement to a supplier who is not named in a contract. Items or services may be provided on an emergency basis without prior authorization, but will be reviewed for appropriateness to the accepted industrial condition and medical necessity on a retrospective basis.

(2) The department or self-insurer will inform providers and suppliers of the selected groups of items for which purchasing contracts have been established, including the beginning and ending dates of the contracts.

(3) Prior authorization by an authorized representative of the department or self-insurer will be required for reimbursement of selected items and services which are provided to claimants. Payment will be denied for selected items or services supplied without prior authorization. The supplier, not the claimant, will be financially responsible for providing selected items or services to claimants without prior authorization. In cases where a claimant's doctor recommends rental or purchase of a contracted item from a supplier who lacks a contract agreement, prior authorization will be required.

The decision to grant or deny prior authorization for reimbursement of selected services or items will be based on the following criteria:

(a) The claimant is eligible for coverage.

(b) The service or item prescribed is appropriate and medically necessary for treatment of the claimant's accepted industrial condition.

(4) The decision to rent or purchase an item will be made based on a comparison of the projected rental costs of the item with its purchase price. An authorized representative of the department or self-insurer will decide whether to rent or purchase certain items provided they are appropriate and medically necessary for treatment of the claimant's accepted condition. Decisions to rent or purchase items will be based on the following information:

- (a) Purchase price of the item.
- (b) Monthly rental fee.
- (c) The prescribing doctor's estimate of how long the item will be needed.

(5) The department will review the medical necessity, appropriateness, and quality of items and services provided to claimants.

(6) The department's STATEMENT FOR MISCELLANEOUS SERVICES form or electronic transfer format specifications must be used for billing the department for miscellaneous services, equipment, supplies, appliances, and transportation. Bills must be itemized according to instructions in WAC 296-20-125 and the department or self-insurer's billing instructions. Bills for medical appliances and equipment must include the type of item, manufacturer name, model name and number, and serial number.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-22-052 (Order 87-22), § 296-23-500, filed 11/2/87; 83-24-016 (Order 83-35), § 296-23-500, filed 11/30/83, effective 1/1/84.]

WAC 296-23-50014 Stimulators.

Bone stimulators.

M 6418 Electromagnetic field bone stimulator rental.
TAX 00

Muscle stimulators.

M 6419 Pulsed galvanic muscle stimulator rental.
TAX 00

Transcutaneous electrical nerve stimulators (TENS).

M 6420 TENS rental.
M 6421 TENS purchase.
M 6422 TENS supplies.
TAX 00

Unlisted stimulator service or accessories.

M 7199 Unlisted stimulator items or service.
TAX 00

For qualifications regarding prior authorization and billing of stimulators refer to WAC 296-23-500, 296-20-1102, and 296-20-125.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-22-052 (Order 87-22), § 296-23-50014, filed 11/2/87; 86-06-032 (Order 86-19), § 296-23-50014, filed 2/28/86, effective 4/1/86; 83-24-016 (Order 83-35), § 296-23-50014, filed 11/30/83, effective 1/1/84.]

CHIROPRACTIC

WAC 296-23-615 Office visits and special services.

DEFINITIONS:

Routine office visit: A level of service pertaining to the evaluation and treatment of a condition requiring only an abbreviated history and exam, i.e.:

- (1) Palpation, exam and adjustment of one or more areas.
- (2) Brief exam and no adjustment.

Extended office visit: A level of service pertaining to an evaluation of patient with a new or existing problem requiring a detailed history, review of records, exam, and a formal conference with patient or family to evaluate and/or adjust therapeutic treatment management and progress.

Comprehensive office visit: A level of service pertaining to an indepth evaluation of a patient with a new or existing problem, requiring development or complete re-evaluation of treatment data; includes recording of chief complaints and present illness, family history, past treatment history, personal history, system review; and a complete exam to evaluate and determine appropriate therapeutic treatment management and progress.

REPORTING:

Reporting requirements are outlined in WAC 296-20-06101. The department or self-insurer will accept a brief narrative report of treatment received and the patient's progress as supporting documentation for billings in lieu of routine follow-up office notes.

CHIROPRACTIC MODIFIERS:

-22 Unusual services: When treatment services provided are greater than that usually required for listed procedures. Use of this modifier must be based on the injured worker's need for extended or unusual care. A report is required; the modifier -22 should be added to the procedure number.

-52 Reduced services: Under certain circumstances no treatment may be given, in these cases the procedure should be reduced and modifier -52 should be added to the procedure number.

MATERIAL SUPPLIED BY DOCTOR:

Department or self-insurer will reimburse the doctor for materials supplied, i.e. cervical collars, heel lifts, etc., at cost only. In addition, a handling fee, not to exceed five percent of the wholesale cost of the item, will be paid. See RCW 19.68.010, professional license statutes. Use procedure number C99070.

SPECIAL SERVICES:

The following services are generally part of the basic services listed in the maximum fee schedule but do involve additional expenses to the chiropractor for materials, for his time or that of his employees. These services

are generally provided as an adjunct to common chiropractic services and should be used only when circumstances clearly warrant an additional charge over and above the usual charges for the basic services.

	Unit Value
C90001 Completion of report of accident	12.0
C90097 Completion of reopening application	12.0
C99032 Mileage, one way, each mile beyond 7 mile radius of point of origin (office or home), per mile	2.0
C99040 Completion of disability card	2.0
C99044 Doctor's estimate of physical capacities	10.0
C99052 Services requested between 10:00 p.m. and 8:00 a.m. in addition to basic services, provided the office is closed during this period of time	12.0
C99054 Services requested on Sundays and holidays in addition to basic services provided office is closed	12.0
C99070 Supplies, materials provided by doctor. Bill at cost	BR
C99080 Special report requested by the agency or 60-day report (see WAC 296-20-06101)	BR

INITIAL VISIT

C90000 Routine examination, history, chiropractic adjustment and submission of a report	20.0
C90017 Extended office visit including treatment - report required	30.0
C90020 Comprehensive office visit including treatment - report required in addition to the report of accident	40.0

FOLLOW-UP VISITS

C90050 Office visit including chiropractic adjustment	16.0
C90070 Extended office visit including treatment - report required	30.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-615, filed 7/23/87; 83-16-066 (Order 83-23), § 296-23-615, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-615, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-615, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-23-615, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-23-615, filed 11/28/75, effective 1/1/76; Order 74-39, § 296-23-615, filed 11/22/74, effective 4/1/75; Order 74-7, § 296-23-615, filed 1/30/74; Order 68-7, § 296-23-615, filed 11/27/68, effective 1/1/69.]

PHYSICAL THERAPY

WAC 296-23-715 Modalities.

	Unit Value
Physician or therapist is required to be in constant attendance.	
(97000 has been deleted. To report, use 97010-97039)	
P97010 Physical medicine treatment to one area, initial 30 minutes; hot or cold packs	12.0
P97012 traction, mechanical	12.0
P97014 electrical stimulation (unattended)	12.0
P97016 vasopneumatic devices	12.0
P97018 paraffin bath	12.0
P97020 microwave	12.0
P97022 whirlpool	12.0
P97024 diathermy	12.0
P97026 infrared	12.0
P97028 ultraviolet	12.0
P97039 unlisted modality (specify)	12.0
P97040 modality; each additional 15 minutes	3.75
P97050 Two or more modalities to the same area	13.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-715, filed 7/23/87; 83-16-066 (Order 83-23), § 296-23-715, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-715, filed 12/23/80, effective 3/1/81; Order 74-7, § 296-23-715, filed 1/30/74; Order 68-7, § 296-23-715, filed 11/27/68, effective 1/1/69.]

WAC 296-23-725 Tests and measurements.

	Unit Value
P97700 Office visit, including one of the following tests or measurements with report, initial 30 minutes.	24.0
(a) Orthotic "check-out"	
(b) Prosthetic "check-out"	
(c) Activities of daily living "check-out"	
(d) Biofeedback evaluation	
P97701 Each additional 15 minutes	12.0
P97720 Extremity testing for strength, dexterity or stamina, initial 30 minutes	24.0
P97721 Each additional 15 minutes	12.0

(P97740, P97741 have been deleted. To report, see P97530, P97531)

P97730 Performance-based physical capacities evaluation with report. Flat fee	\$375
P97752 Muscle testing, torque curves during isometric and isokinetic exercise (e.g., by use of Cybex machine)	24.0
P99070 Supplies and materials provided by the therapist over and above those usually included with office visit or other services rendered. List item provided. Bill at cost	BR

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-08-004 (Order 87-09), § 296-23-725, filed 3/20/87; 86-06-032 (Order 86-19), § 296-23-725, filed 2/28/86, effective 4/1/86; 83-16-066 (Order 83-23), § 296-23-725, filed 8/2/83. Statutory Authority: RCW 51.04.020(4), 51.04.030, and 51.16.120(3). 81-01-100 (Order 80-29), § 296-23-725, filed 12/23/80, effective 3/1/81; Order 74-7, § 296-23-725, filed 1/30/74.]

DRUGLESS THERAPEUTICS

WAC 296-23-811 Office visits and special services.

Definitions:

Routine office visit: A level of service pertaining to the evaluation and treatment of a condition requiring only an abbreviated history and exam.

Extended office visit: A level of service pertaining to an evaluation of patient with a new or existing problem requiring a detailed history, review of records, exam, and a formal conference with patient or family to evaluate and/or adjust therapeutic treatment management and progress.

Comprehensive office visit: A level of service pertaining to an indepth evaluation of a patient with a new or existing problem, requiring development or complete re-evaluation of treatment data; includes recording of chief complaints and present illness, family history, past treatment history, personal history, system review; and a complete exam to evaluate and determine appropriate therapeutic treatment management and progress.

Reporting:

Reporting requirements are outlined in WAC 296-20-06101. The department or self-insurer will accept a brief narrative report of treatment received and the patient's progress as supporting documentation for billings in lieu of routine follow-up office notes.

Drugless therapeutic modifiers:

-22 Unusual services: When treatment services provided are greater than that usually required for listed procedures. Use of this modifier must be based on the injured worker's need for extended or unusual care. A report may be required. The modifier -22 should be added to the procedure number.

-52 Reduced services: Under certain circumstances no treatment may be given, in these cases the procedure should be reduced by 10 units and modifier -52 should be added to the procedure number.

Material supplied by doctor:

Department or self-insurer will reimburse the doctor for materials supplied, i.e. cervical collars, heel lifts, etc., at cost only. In addition, a handling fee not to exceed five percent of the wholesale cost of the item, will be paid. See RCW 19.68.010, Professional license statutes. Procedure Number D99070 should be used to bill these charges.

Special services:

The following services are generally part of the basic services listed in the maximum fee schedule but do involve additional expenses to the drugless therapeutic practitioner for materials, for his time or that of his employees. These services are generally provided as an adjunct to common drugless therapeutic services and should be used only when circumstances clearly warrant an additional charge over and above the usual charges for the basic services.

	Unit Value
D90001 Completion of report of accident	12.0
D90097 Completion of reopening application	12.0
D99032 Mileage, one way, each mile beyond 7 mile radius of point of origin (office or home), per mile	2.0
D99040 Completion of disability card	2.0
D99044 Doctor's estimate of physical capacities	10.0
D99052 Services requested between 6:00 p.m. and 8:00 a.m. in addition to basic services, provided the office is closed during this period of time	12.0
D99054 Services requested on Sundays and holidays in addition to basic services provided office is closed.	12.0
D99070 Supplies, materials provided by doctor - bill at cost	BR
D99080 Special report requested by the agency or 60 day report. See WAC 296-20-06101	BR

INITIAL VISIT

D90000 Routine examination, history, and/or treatment (routine procedure), and submission of a report	20.0
D90017 Extended office visit including treatment - report required	30.0
D90020 Comprehensive office visit including treatment - report required in addition to the	

Unit Value

report of accident	40.0
Follow-up treatment	
D90050 Routine office visit including evaluation and/or treatment	16.0
D90070 Extended office visit including treatment - report required	30.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23-811, filed 7/23/87. Statutory Authority: RCW 51.04.020(4), 51.04.030 and 51.16.120(3). 81-24-041 (Order 81-28), § 296-23-811, filed 11/30/81, effective 1/1/82; 81-01-100 (Order 80-29), § 296-23-811, filed 12/23/80, effective 3/1/81; Order 76-34, § 296-23-811, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-23-811, filed 11/28/75, effective 1/1/76; Order 74-39, § 296-23-815, (codified as WAC 296-23-811), filed 11/22/74, effective 4/1/75; Order 74-7, § 296-23-811, filed 1/30/74; Order 68-7, § 296-23-811, filed 11/27/68, effective 1/1/69.]

VOCATIONAL SERVICES

WAC 296-23-980 Occupational therapy services.

	Unit Value
97010 Physical medicine treatment to one area, hot or cold packs	12.0
97016 vasopneumatic devices	12.0
97018 paraffin bath	12.0
97110 therapeutic exercises	16.0
97112 neuromuscular reeducation	16.0
97114 functional activities	16.0
97145 Physical medicine treatment to one area, each additional 15 minutes	5.0
97200 Combination of any modality(s) and procedure(s), initial 30 minutes	16.0
97201 Each additional 15 minutes	5.0
97500 Orthotics training (dynamic bracing, splinting, etc.) upper extremities, initial 30 minutes	24.0
97501 each additional 15 minutes	12.0
97520 Prosthetic training, initial 30 minutes	24.0
97521 each additional 15 minutes	12.0
97530 Kinetic activities to increase coordination, strength and/or range of motion, one area (any two extremities or trunk), initial 30 minutes	24.0
97531 each additional 15 minutes	12.0
97540 Activities of daily living (ADL) and diversional activities, initial 30 minutes	24.0
97541 each additional 15 minutes	12.0
97700 One of the following tests or measurements with report, initial 30 minutes	24.0
(a) Orthotic "check-out"	
(b) Prosthetic "check-out"	
(c) Activities of daily living "check-out"	
(d) Biofeedback evaluation	
97701 each additional 15 minutes	12.0
97720 Extremity testing for strength, dexterity or stamina, initial 30 minutes	24.0
97721 each additional 15 minutes	12.0
97730 Performance-based physical capacities evaluation with report. Flat fee	\$375
97799 Unlisted physical medicine service or procedure	BR
99030 Mileage, one way, each mile beyond 7 mile radius of point of origin (office or home), per mile	2.0
99070 Supplies and materials provided by the therapist over and above those usually included with office visit or other services rendered. List item provided. Bill at cost	BR

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-08-004 (Order 87-09), § 296-23-980, filed 3/20/87; 86-20-074 (Order 86-36), § 296-23-980, filed 10/1/86, effective 11/1/86; 86-06-032 (Order 86-19), § 296-23-980, filed 2/28/86, effective 4/1/86.]

Chapter 296-23A WAC

HOSPITAL RULES

HOSPITALS

WAC

HOSPITAL RULES

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- 296-23A-105 Payment for hospital inpatient and outpatient services.
- 296-23A-110 Hospital outpatient fee schedule information.
- 296-23A-115 Hospital outpatient services conversion factors.
- 296-23A-120 Questionable eligibility.
- 296-23A-125 Refund of incorrect payments.
- 296-23A-130 Treatment of unrelated illness or injury.
- 296-23A-135 Closed claims.
- 296-23A-140 Take-home Rx's.
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- 296-23A-170 Outliers.
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HOSPITAL OUTPATIENT RADIOLOGY

- 296-23A-200 General information—Hospital outpatient radiology.
- 296-23A-205 Billing procedures.
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- 296-23A-215 Responsibility for x-rays.
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- 296-23A-225 Additional views.
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- 296-23A-235 Special report.
- 296-23A-240 Head and neck.
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- 296-23A-258 Vascular system.
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- 296-23A-262 Diagnostic ultrasound.
- 296-23A-264 Therapeutic radiology.
- 296-23A-266 Nuclear medicine.
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HOSPITAL OUTPATIENT PATHOLOGY AND LABORATORY

- 296-23A-300 General information—Hospital outpatient pathology and laboratory.
- 296-23A-310 Billing procedures.
- 296-23A-315 Unlisted service or procedure.
- 296-23A-320 Special report.
- 296-23A-325 Panel or profile tests.
- 296-23A-330 Urinalysis.
- 296-23A-335 Chemistry and toxicology.
- 296-23A-340 Hematology.
- 296-23A-345 Immunology.
- 296-23A-350 Microbiology.
- 296-23A-355 Cytopathology.
- 296-23A-360 Miscellaneous.

HOSPITAL OUTPATIENT PHYSICAL THERAPY

- 296-23A-400 Hospital outpatient physical therapy rules.
- 296-23A-410 Muscle testing.
- 296-23A-415 Modalities.
- 296-23A-420 Procedures.
- 296-23A-425 Tests and measurements.

WAC 296-23A-100 General information. Hospital services will be paid when necessary for treatment of the accepted industrial illness or injury. General information and rules pertaining to the care of injured workers are explained in the section beginning WAC 296-20-010 through 296-20-17003.

To avoid a delay in paying hospital bills be sure the claim number is listed in the space provided on the bill form. If the department's accident report form is completed at the hospital, then a preassigned claim number will be on the form. In other circumstances, the hospital may not be able to obtain the claim number from the injured worker or the attending physician prior to hospitalization and/or outpatient services. When this occurs, contact the local service location or call the department's provider toll-free line in Olympia. Self-insurers may be contacted directly to obtain claim numbers on self-insured claims. See Appendix B in the medical aid rules and maximum fee schedules for a list of self-insured employers.

Do not substitute the date of injury with either the date of admission or the date of service.

We urge you to submit bills to the department or self-insurer on a monthly basis.

The department or self-insurer will pay hospital inpatient charges for bed rest, physical therapy and/or administration of injectable drugs only under the conditions specified in WAC 296-20-075.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23A-100, filed 7/23/87; 87-03-005 (Order 86-47), § 296-23A-100, filed 1/8/87.]

WAC 296-23A-105 Payment for hospital inpatient and outpatient services. Effective January 1, 1988, the department or self-insurer pays for hospital inpatient services using either prospectively determined diagnosis related group per case rates or allowed charges multiplied by a percent of allowed charges factor. The diagnosis related group per case rates will be determined from case mix adjusted historical per case costs, indexed to the payment period for inflation and other factors. Hospital outpatient radiology, pathology and laboratory, and physical therapy services which do not occur within one day of an inpatient admission are to be billed and will be paid using the appropriate labor and industries outpatient fee schedule procedure codes. Effective January 1, 1988, hospital outpatient services which are not billed and paid using the hospital outpatient fee schedule will be paid a percent of allowed charges.

All hospital inpatient and outpatient services and billed charges are subject to review by the department or a representative chosen by the department.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-24-050 (Order 87-23), § 296-23A-105, filed 11/30/87, effective 1/1/88; 87-03-005 (Order 86-47), § 296-23A-105, filed 1/8/87.]

WAC 296-23A-110 Hospital outpatient fee schedule information. The hospital outpatient fee schedule contains procedure codes and fee maximums for radiology, pathology and laboratory, and physical therapy services

performed in a hospital outpatient setting by practitioners who are approved by the department (see WAC 296-20-015). The fee schedule is based on the Physicians' Current Procedural Terminology (CPT) manual of procedure codes with modifications to accommodate ease of billing and department rules. (Note: Do not use the CPT manual as a billing reference.)

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-110, filed 1/8/87.]

WAC 296-23A-115 Hospital outpatient services conversion factors.

Radiology (codes 70000 through 79999)	\$5.92
Pathology and laboratory (codes 80000 through 89999)	\$0.56
Physical therapy (codes beginning with 9)	\$1.29

(The conversion factor multiplied by the unit value equals the fee maximum for a procedure code in this chapter.)

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 88-24-011 (Order 88-28), § 296-23A-115, filed 12/1/88, effective 1/1/89; 87-03-005 (Order 86-47), § 296-23A-115, filed 1/8/87.]

WAC 296-23A-120 Questionable eligibility. It is the responsibility of the hospital to try to determine at the time of admission or outpatient service(s) if the injured worker is covered under the Industrial Insurance Act for an allowable industrial illness or injury as stated in the medical aid rules and maximum fee schedules.

In cases of questionable eligibility for an industrial illness or injury, where the hospital has billed the injured worker or other insurance, and the claim is subsequently allowed, the hospital must make a full refund to the injured worker or other insurer and bill the department or self-insurer for services rendered.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-120, filed 1/8/87.]

WAC 296-23A-125 Refund of incorrect payments. When the department or self-insurer has paid a hospital billing and it is later determined that the service performed was not the responsibility of the department or self-insurer, then it is the hospital's responsibility to refund the department. The department or self-insurer will deduct the incorrect payments from future hospital payments if the hospital does not refund.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-125, filed 1/8/87.]

WAC 296-23A-130 Treatment of unrelated illness or injury. Treatment or surgery for an unrelated illness or injury, while the injured worker is hospitalized or receiving hospital outpatient services, is not usually allowed. When such unrelated treatment is permitted by the department or self-insurer, the requesting physician must identify which services are needed due to the industrial illness or injury and which are needed due to the unrelated condition(s). Diagnostic tests and/or treatment for unrelated conditions directly affecting recovery

from the industrial illness or injury may be given consideration as stated under WAC 296-20-055.

Diagnostic tests and studies ordered by the attending physician as a part of the initial care and diagnosis of an industrial injury will be allowed.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-130, filed 1/8/87.]

WAC 296-23A-135 Closed claims. The department or self-insurer will not pay for services rendered after the claim has been closed. If responsibility is later accepted by the department or self-insurer, WAC 296-23A-120 will apply.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-135, filed 1/8/87.]

WAC 296-23A-140 Take-home Rx's. Take-home prescriptions will be authorized upon discharge of the patient or completion of hospital outpatient services if the medication is necessary for the industrial illness or injury.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-140, filed 1/8/87.]

WAC 296-23A-145 Routine laboratory procedures on admission. On admission of an industrially injured patient to a hospital, the department or the self-insurer will allow routine laboratory work-up consisting of a complete blood count or hematocrit, urinalysis, serology, and routine admission chemical screening procedure. Laboratory reports for the procedures accomplished must accompany the bill.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-145, filed 1/8/87.]

WAC 296-23A-150 Billing procedures. Bills for hospital services must be submitted on UB-82 bill forms, transmitted electronically on department provided software, or transmitted electronically using department file format specifications. Providers using the UB-82 bill form must follow the billing instructions provided by the Washington state hospital association. Providers using any of the electronic transfer options must follow department instructions for electronic billing in addition to instructions provided by the Washington state hospital association. The self-insurer may accept other bill forms.

(1) The following information must appear on the UB-82 for hospital inpatient services:

- (a) Provider name;
- (b) Patient control number;
- (c) Type of bill;
- (d) Department of labor and industries provider number;
- (e) Patient name;
- (f) Patient address;
- (g) Birth date;
- (h) Sex;
- (i) Admission date;
- (j) Patient status;
- (k) Statement covers period;

- (l) Date of injury;
 - (m) Description (include daily rate with room accommodation revenue code);
 - (n) Revenue code;
 - (o) Units;
 - (p) Total charges;
 - (q) Payer;
 - (r) Social Security number;
 - (s) Claim number;
 - (t) Employer name;
 - (u) Narrative of principal and other diagnoses;
 - (v) Principal and other ICD diagnosis code(s) when applicable;
 - (w) Narrative of principal and other procedure(s);
 - (x) Principal and other ICD procedure code(s) when applicable; and
 - (y) Procedure date(s) for ICD procedure code(s) when applicable.
- (2) The following information must appear on the UB-82 for hospital outpatient services:
- (a) Provider name;
 - (b) Patient control number;
 - (c) Type of bill;
 - (d) Department of labor and industries provider number;
 - (e) Patient name;
 - (f) Patient address;
 - (g) Birth date;
 - (h) Sex;
 - (i) Statement covers period;
 - (j) Date of injury;
 - (k) Description;
 - (l) Revenue code when applicable;
 - (m) Department of labor and industries procedure codes for radiology, pathology and laboratory, and physical therapy services;
 - (n) Units;
 - (o) Total charges;
 - (p) Payer;
 - (q) Social Security number;
 - (r) Claim number;
 - (s) Employer name;
 - (t) Narrative of principal and other diagnoses with side of body; and
 - (u) Principal and other ICD diagnosis code(s) when applicable.

Summarize inpatient charges by revenue codes as specified in the UB-82 instructions.

(3) Supporting documentation for inpatient and outpatient services must be attached to the billings. Place the claim number on the upper right hand corner of each attachment. (a) through (j) of this subsection are needed for inpatient services, and (d) through (j) of this subsection are needed for outpatient services:

- (a) Admission history and physical examination;
- (b) Discharge summary for stays over forty-eight hours;
- (c) Itemized detail of summary charges;
- (d) X-ray reports;
- (e) Laboratory and pathology reports;

- (f) Diagnostic studies reports;
- (g) Emergency room reports;
- (h) Operative reports;
- (i) Physical therapy notes; and
- (j) Occupational therapy notes.

Providers using any of the electronic transfer options provided by the department must send the department the required documentation normally associated with a bill, as outlined in subsection (3) of this section, within thirty days of the date billing information was sent to the department on electronic medium. Providers must comply with electronic billing instructions supplied by the department regarding the submission of hospital bill documentation. Place the claim number on the upper right hand corner of each supporting document submitted.

(4) For a bill to be considered for payment, it should be received by the department or self-insurer within ninety days from the date of service.

(5) The department or the self-insurer may reject bills for services rendered in violation of the medical aid rules and maximum fee schedules.

(6) Charges for professional services provided by hospital staff physicians must be submitted on the Health Insurance Claim Form, HCFA-1500. Hospitals using any of the electronic transfer options must follow department instructions for electronic billing in addition to department instructions for completing the Health Insurance Claim Form, HCFA-1500. The emergency room will be considered the office for those physicians providing regular emergency room care to the hospital, and fees will be allowed on this basis.

(7) Call-back services between 6 p.m. and 8 a.m., of surgical staff not normally on duty during this period of time, should be billed using the appropriate revenue codes.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23A-150, filed 7/23/87; 87-03-005 (Order 86-47), § 296-23A-150, filed 1/8/87.]

WAC 296-23A-155 New hospitals. New hospitals are those entities which were not open for at least one year prior to the department's implementation of the latest diagnosis related group rates or percent of allowed charges factor for hospitals paid by the department. A change in ownership does not constitute the creation of a new hospital. If a hospital changes ownership, rates will be those payable to the previous owner.

Payment for services provided by new hospitals will be at the average diagnosis related group rates and average percent of allowed charges for the new hospital's peer group.

A new hospital will be paid using its hospital-specific percent of allowed charges factor within three years of receiving a provider number(s) from the department.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-24-050 (Order 87-23), § 296-23A-155, filed 11/30/87, effective 1/1/88.]

WAC 296-23A-160 Excluded and included services. (1) Ambulance and air transportation services are excluded from the diagnosis related group payments.

(2) Preadmission services: Services performed in a hospital outpatient setting within one day prior to admission into the hospital must be billed as hospital inpatient services.

(3) Freestanding and distinct part psychiatric, rehabilitation, and substance abuse facilities as defined by the health care finance administration will be excluded from payment by diagnosis related group rates. These facilities will be paid a percent of allowed charges. The department may choose to exclude other freestanding and distinct part units from diagnosis related group rates.

(4) Bills which are coded as diagnosis related groups 000, 469, and 470 will be denied.

(5) Military, health maintenance organization (HMO), and children's hospitals will be paid their allowed charges.

(6) Bills which are coded as diagnosis related groups paid by the department, and are for hospital services where the injured worker has been admitted and discharged on the same day, will be reviewed by the department and may be paid as hospital outpatient services.

(7) All hospital services provided to an injured worker admitted to a hospital will be included in the diagnosis related group rates unless otherwise specified.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-24-050 (Order 87-23), § 296-23A-160, filed 11/30/87, effective 1/1/88.]

WAC 296-23A-165 Out-of-state hospitals. (1) Hospitals not in Oregon, Idaho, or Washington will be paid a percent of allowed charges. The percent of allowed charges may differ for services performed in the inpatient and outpatient settings.

(2) Oregon and Idaho hospitals: Hospital outpatient radiology, pathology and laboratory, and physical therapy services are to be billed and will be paid using the appropriate labor and industries outpatient fee schedule procedure codes. Other hospital outpatient services will be paid a percent of allowed charges.

Hospital inpatient services will be paid a percent of allowed charges. The percent of allowed charges may differ for services performed in the inpatient and outpatient settings.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-24-050 (Order 87-23), § 296-23A-165, filed 11/30/87, effective 1/1/88.]

WAC 296-23A-170 Outliers. (1) Outlier payments are for cases with unusually high or low costs. Outlier status will be granted to qualified diagnosis related groups cases paid by the department.

(2) Qualification for high outlier status: To qualify as a high outlier under the diagnosis related groups payment system, the allowed charges (ACHGE) for the case minus a dollar threshold (\$threshold) must be greater than zero:

$$(ACHGE - \$threshold) > 0.$$

The dollar threshold is defined as the greater of two standard deviations above the state-wide diagnosis related group rate for each diagnosis related group paid by

the department or \$9,000. The state-wide per case rates used to compute the standard deviations for the diagnosis related groups will be computed across all relevant cases in the historical data base excluding outliers.

(3) Payment: Outlier cases will be paid a hospital's diagnosis related group rate plus an add-on. The add-on will be calculated by first subtracting the dollar threshold from the allowed charges for the case. This product is then multiplied by that hospital's percent of allowed charges factor (F) and then by eighty percent:

$$(ACHGE - \$threshold) * F * 0.80 = \text{Add-on.}$$

The outlier payment will be as follows:

$$\text{Outlier payment} = \text{Hospital's DRG rate} + \text{add-on.}$$

(4) To have a bill considered for high outlier status, the hospital must enter "61" for the condition code, block 35 of the UB-82.

(5) Hospitals must submit the following information with a bill, in addition to the information required in WAC 296-23A-150(3), when requesting a high outlier:

- (a) Physician's progress notes.
- (b) Physician's orders.
- (c) Nurse's notes.

(6) Qualification for low outlier status: To qualify as a low outlier, the allowed charges multiplied by that hospital's percent of allowed charges factor must be less than the greater of ten percent of the state-wide diagnosis related group rate or \$200. The state-wide diagnosis related group rate will be computed across all relevant cases in the historical data base excluding outliers. Low outlier cases will be paid that hospital's inpatient percent of allowed charges factor multiplied by the allowed charges for the case.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-24-050 (Order 87-23), § 296-23A-170, filed 11/30/87, effective 1/1/88.]

WAC 296-23A-175 Interim bills. (1) An interim bill is defined as a bill which has a patient status code of 30 in block 21 of the UB-82.

(2) Interim bills which are assigned to diagnosis related groups paid per case by the department will be denied.

(3) If an interim bill is coded as a diagnosis related group not paid by the department, then the bill will be paid as a percent of allowed charges. If an interim bill is paid as a percent of allowed charges, and a subsequent bill coded as a diagnosis related group paid by the department for the same injured worker has a first date of service within seven days of the last date of service of the previous bill, then the bills will be subject to review by the department.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-24-050 (Order 87-23), § 296-23A-175, filed 11/30/87, effective 1/1/88.]

WAC 296-23A-180 Readmissions. (1) Both bills for an injured worker who is readmitted within seven days of a previous discharge and for which at least one bill is

coded as a diagnosis related group paid by the department will be subject to review by the department. Payment for services associated with these bills will depend on the review.

(2) Both bills for a readmitted worker involving different hospitals, and for which at least one bill is coded as a diagnosis related group paid by the department, will be reviewed by the department and may be paid using the payment method for transfers.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-24-050 (Order 87-23), § 296-23A-180, filed 11/30/87, effective 1/1/88.]

WAC 296-23A-185 Transfers. (1) A transfer is defined as an admission to another acute care hospital within seven days of the previous discharge for the same injured worker. All transfers will be subject to review by the department and payment will be determined according to the department's interpretation of the review. The transferring hospital may qualify for high and low outlier status.

(2) When the stay at the transferring hospital is a diagnosis related group paid by the department and does not qualify as a low outlier, the transferring hospital is paid a per day rate for each day of care allowed by the department's review prior to the transfer. The per day rate is determined by dividing that hospital's rate for the appropriate diagnosis related group by that diagnosis related group's average length of stay determined by the department. If the case does not qualify as a high outlier, payment to the transferring hospital will not exceed the appropriate diagnosis related group rate that would have been paid had the injured worker not been transferred to another hospital.

(3) The receiving hospital in a transfer will be paid according to the department's review of the case. If the receiving hospital's stay is a diagnosis related group paid by the department, then the hospital will receive the appropriate per case and outlier payments. If the case is not a diagnosis related group paid by the department, then the hospital is paid a percent of allowed charges.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-24-050 (Order 87-23), § 296-23A-185, filed 11/30/87, effective 1/1/88.]

WAC 296-23A-190 Adjustment of rates. If a hospital can demonstrate to the department that its percent of allowed charges factor has changed by more than ten percent over the percent of allowed charges factor currently applied to the hospital's rates, then the hospital can file for rate relief with the department. To demonstrate this change to the department, the hospital must use independently audited source data from the same time period for which the initial percent of allowed charges factor was calculated. If the department's review of the material submitted by the hospital results in a favorable determination for the hospital, the department will modify the hospital's percent of allowed charges factor and recalculate the hospital's base rates for diagnosis related group rates using the revised percent of charges factor.

The revised rates will apply to all bills with a date of admission on or after a date chosen by the department.

The chosen date will be within four months of the agreement to modify between the hospital and the department.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-24-050 (Order 87-23), § 296-23A-190, filed 11/30/87, effective 1/1/88.]

HOSPITAL OUTPATIENT RADIOLOGY

WAC 296-23A-200 General information—Hospital outpatient radiology. Rules and billing procedures pertaining to all practitioners rendering services to injured workers are presented in the general instructions section beginning with WAC 296-20-010. Some of the similarities are repeated here for the convenience of those hospitals referring to the radiology section. Radiology fees for nonhospital providers are covered in chapter 296-23 WAC.

The following procedures and fee maximums apply only when these services are performed by or under the supervision of a physician.

The department or self-insurer may deny payment for radiology procedures which are determined to be excessive or unnecessary for management of the accepted industrial illness or injury.

The technical component represents the expenses of nonradiologist personnel, materials, facilities and space, used for diagnostic or therapeutic services rendered. It excludes the cost of radio-isotopes.

The professional component represents the professional services supplied by physicians. See WAC 296-23-010 to 296-23-130 for billing the professional component.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-200, filed 1/8/87.]

WAC 296-23A-205 Billing procedures. (1) Department billing instructions appear in WAC 296-20-125. Hospital billing information and instructions appear in WAC 296-23A-100, 296-23A-105, and 296-23A-150.

(2) Fee maximums for radiology services are listed for the combined professional and technical components.

(3) Hospitals are reimbursed only for the technical component at a rate up to and including sixty percent of the fee maximum.

(4) Hospitals should bill their usual and customary rates for the technical component of outpatient radiology services.

(5) Radiology procedures performed by other than the billing hospital shall be billed at the value charged the hospital by the reference (outside) radiology department. When possible, the service should be billed under the same procedure code as billed by the reference radiology department.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-205, filed 1/8/87.]

WAC 296-23A-210 Injection procedures. Values for injection procedures include all usual preinjection and postinjection care specifically related to the injection procedure, necessary local anesthesia, placement of needle or catheter, and injection of contrast media.

Vascular injection procedures are listed in the cardiovascular section. Other injection procedures are listed in the appropriate sections.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-210, filed 1/8/87.]

WAC 296-23A-215 Responsibility for x-rays. (1) X-rays should not be sent to the department or self-insurer unless requested for comparison and interpretation in determining permanent disability, other administrative or legal decisions, and for cases in litigation. X-rays must be retained by the hospital for a period of ten years.

(2) X-rays must be made available upon request to consultants, to medical examiners, to the department, to self-insurers and/or to the board of industrial insurance appeals.

(3) If a hospital ceases to function as an acute care facility, department approved custodial arrangements must be made to insure availability of x-rays on request.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-215, filed 1/8/87.]

WAC 296-23A-220 Duplication of x-rays. Every attempt should be made to minimize the number of x-rays taken of injured workers. The attending physician or any other person or institution having possession of x-rays which pertain to the injury and are deemed to be needed for diagnostic or treatment purposes should make these x-rays available upon request.

The department or self-insurer will not authorize nor pay for additional x-rays when recent x-rays are available except when presented with adequate information regarding the need to retake the x-ray.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-220, filed 1/8/87.]

WAC 296-23A-225 Additional views. The department will only reimburse hospitals for the number of views stated in the description of the procedure. If the number of views taken is not described by a procedure, and the necessity of the views can be supported to the satisfaction of the department, then see WAC 296-23A-230 for the appropriate billing procedure.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-225, filed 1/8/87.]

WAC 296-23A-230 Unlisted service or procedure. A radiology service or procedure may be provided that is not listed in this section of the fee schedule. When reporting such a service, the appropriate "unlisted procedure" code may be used to indicate the service, identifying it by "special report" as discussed in WAC 296-23A-235. The "unlisted procedures" and accompanying codes for the RADIOLOGY section are as follows:

- 76499 Unlisted diagnostic radiologic procedure
- 76999 Unlisted diagnostic ultrasound procedure
- 77299 Unlisted procedure, therapeutic radiology clinical treatment planning
- 77399 Unlisted procedure, medical radiation physics, dosimetry and treatment devices

- 77499 Unlisted procedure, therapeutic radiology clinical treatment management
- 77799 Unlisted procedure, clinical brachytherapy
- 78099 Unlisted endocrine procedure, diagnostic nuclear medicine
- 78199 Unlisted hematopoietic, R-E and lymphatic procedure, diagnostic nuclear medicine
- 78299 Unlisted gastrointestinal procedure, diagnostic nuclear medicine
- 78399 Unlisted musculoskeletal procedure, diagnostic nuclear medicine
- 78499 Unlisted cardiovascular procedure, diagnostic nuclear medicine
- 78599 Unlisted respiratory procedure, diagnostic nuclear medicine
- 78699 Unlisted nervous system procedure, diagnostic nuclear medicine
- 78799 Unlisted genitourinary procedure, diagnostic nuclear medicine
- 78999 Unlisted miscellaneous procedure, diagnostic nuclear medicine
- 79999 Unlisted radionuclide therapeutic procedure.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-230, filed 1/8/87.]

WAC 296-23A-235 Special report. A service that is rarely provided, unusual, variable, or new, may require a special report in determining medical appropriateness of the service. Pertinent information should include an adequate definition or description of the nature, extent, and need for the procedure; and the time, effort and equipment necessary to provide the service. Additional items which may be helpful include: Complexity of symptoms, final diagnosis, pertinent physical findings, diagnostic and therapeutic procedures, concurrent problems, and follow-up care.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-235, filed 1/8/87.]

WAC 296-23A-240 Head and neck.

	Unit Value
(70002, 70003 have been deleted. To report, use 76499)	
70011 Myelography, posterior fossa; complete procedure	BR
70016 Cisternography, positive contrast; complete procedure	BR
(For injection procedure only for cisternography, see 61053)	
(70020, 70021 have been deleted. To report, use 76499)	
(70022 has been deleted. To report CT guidance for stereotactic localization, use 76355)	

Hospitals

296-23A-240

	Unit Value		Unit Value
70030 Radiologic examination, eye, for detection of foreign body	8.8	70350 Cephalogram, orthodontic	4.0
70040 for localization of foreign body (does not include detection)	14.0	70355 Orthopantomogram	10.0
70050 for detection and localization of foreign body	18.0	70360 Radiologic examination, neck; soft tissue	4.0
70100 Radiologic examination, mandible; partial, less than four views	6.0	70370 pharynx or larynx, including fluoroscopy and/or magnification technique	8.0
70110 complete, minimum of four views	10.0	70374 Laryngography, contrast; complete procedure	24.0
70120 Radiologic examination, mastoids; less than three views per side	6.0	70380 Radiologic examination, salivary gland for calculus	6.4
70130 complete, minimum of three views per side	12.0	70391 Sialography; complete procedure . .	8.0
70134 Radiologic examination, internal auditory meati, complete	12.0	(70400 and 70401 have been deleted. To report, use 76499)	
70140 Radiologic examination, facial bones; less than three views	6.0	70450 Computerized axial tomography, head or brain; without contrast material	58.0
70150 complete, minimum of three views	10.0	70460 with contrast material(s)	64.0
70160 Radiologic examination, nasal bones, complete, minimum of three views	6.4	70470 without contrast material, followed by contrast material(s) and further sections	71.0
70171 Dacryocystography nasolacrimal, complete procedure	10.0	(For coronal, sagittal, and/or oblique sections, see 76375)	
70190 Radiologic examination; optic foramina	6.0	70480 Computerized axial tomography, orbit, sella, or posterior fossa or outer, middle, or inner ear; without contrast material	58.0
70200 orbits, complete, minimum of four views	8.0	70481 with contrast material(s)	64.0
70210 Radiologic examination, sinuses, paranasal, less than three views . .	5.0	70482 without contrast material, followed by contrast material(s) and further sections	71.0
70220 Radiologic examination, sinuses, paranasal, complete, minimum of three views	8.8	(For coronal, sagittal, and/or oblique sections, see 76375)	
(70230, 70231 have been deleted. To report, use 76499)		70486 Computerized axial tomography, maxillofacial area; without contrast material	58.0
70240 Radiologic examination, sella turcica	5.0	70487 with contrast material(s)	64.0
70250 Radiologic examination, skull; less than four views, with or without stereo	6.0	70488 without contrast material, followed by contrast material(s) and further sections	71.0
70260 complete, minimum of four views, with or without stereo . . .	12.0	(For coronal, sagittal, and/or oblique sections, see 76375)	
70300 Radiologic examination, teeth; single view	2.0	70490 Computerized axial tomography, soft tissue neck; without contrast material	BR
70310 partial examination, less than full mouth	4.0	70491 with contrast material(s)	BR
70320 complete, full mouth	8.0	70492 without contrast material followed by contrast material(s) and further sections	BR
70328 Radiologic examination, temporomandibular joint, open and closed mouth; unilateral	6.0	(For coronal, sagittal, and/or oblique sections, see 76375)	
70330 bilateral	8.8	(For cervical spine, see 72125, 72126)	
70333 Temporomandibular joint arthrography (includes a contrast arthrogram and appropriate laminographic studies); complete procedure	21.1		

	Unit Value
70540 Magnetic resonance (e.g., proton) imaging; orbit, face, and neck	120.0
(70550, 70552 have been deleted. To report, use 70551)	
70551 brain (including brain stem)	120.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-240, filed 1/8/87.]

WAC 296-23A-242 Chest.

	Unit Value
(71000 Chest minifilm has been deleted)	
71010 Radiologic examination, chest; single view, frontal	4.0
71015 stereo, frontal	5.0
71020 two views, frontal and lateral	7.0
71021 apical lordotic procedure	7.2
71022 oblique projections	7.2
71023 with fluoroscopy	BR
71030 Radiologic examination, chest, complete, minimum of four views	8.0
71034 with fluoroscopy	10.0
(For separate chest fluoroscopy, see 76000)	
71035 Radiologic examination, chest, special views, e.g., lateral decubitus, Bucky studies	BR
71036 Fluoroscopic localization for needle biopsy of intrathoracic lesion, including follow-up films	BR
71038 Fluoroscopic localization for trans-bronchial biopsy or brushing	BR
71041 Bronchography, unilateral; complete procedure	14.0
71061 Bronchography, bilateral; complete procedure	22.0
71100 Radiologic examination, ribs, unilateral; two views	7.2
71101 including posteroanterior chest, minimum of three views	11.2
71110 Radiologic examination, ribs, bilateral; three views	10.0
71111 including posteroanterior chest, minimum of four views	14.0
71120 Radiologic examination; sternum, minimum of two views	6.0
71130 sternoclavicular joint or joints, minimum of three views	6.0
71250 Computerized axial tomography, thorax; without contrast material	77.0
71260 with contrast material(s)	84.0

71270 without contrast material, followed by contrast material(s) and further sections	90.0
(For coronal, sagittal, and/or oblique sections, see 76375)	

71550 Magnetic resonance (e.g., proton) imaging, chest (e.g., for evaluation of hilar and mediastinal lymphadenopathy)	120.0
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[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-242, filed 1/8/87.]

WAC 296-23A-244 Spine and pelvis.

	Unit Value
72010 Radiologic examination, spine, entire, survey study, anteroposterior and lateral	16.0
72020 Radiologic examination, spine, single view, specify level	6.5
72040 Radiologic examination, spine, cervical; anteroposterior and lateral	6.0
72050 minimum of four views	10.0
72052 complete, including oblique and flexion and/or extension studies	15.2
72070 Radiologic examination, spine; thoracic, anteroposterior and lateral	9.0
72072 thoracic, anteroposterior and lateral, including swimmer's view of the cervicothoracic junction	12.0
72074 thoracic, complete, including obliques, minimum of four views	16.0
72080 thoracolumbar, anteroposterior and lateral	9.0
72090 scoliosis study, including supine and erect studies	6.0
72100 Radiologic examination, spine, lumbosacral; anteroposterior and lateral	9.0
72110 complete with oblique views	16.0
72114 complete, including bending views	18.5
72120 Radiologic examination, spine, lumbosacral, bending views only, minimum of four views	10.0
72125 Computerized axial tomography, cervical spine; without contrast material	62.4
72126 with contrast material	72.8
72127 without contrast material, followed by contrast material(s) and further sections	BR
72128 Computerized axial tomography, thoracic spine; without contrast material	62.4
72129 with contrast material	72.8

Unit Value [Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23A-244, filed 7/23/87; 87-03-005 (Order 86-47), § 296-23A-244, filed 1/8/87.]

- 72130 without contrast material, followed by contrast material(s) and further sections
- 72131 Computerized axial tomography, lumbar spine; without contrast material
- 72132 with contrast material
(For coronal, sagittal, and/or oblique sections, see 76375)
- 72133 without contrast material, followed by contrast material(s) and further sections
(72140 has been deleted. To report see 72141-72144)
- 72141 Magnetic resonance (e.g., proton) imaging, spinal canal and contents (two sequences or standard examination); cervical
- 72143 thoracic
- 72144 lumbar
(72145 has been deleted. To report, see 72125-72132)
- 72170 Radiologic examination, pelvis; anteroposterior only
- 72180 stereo
- 72190 complete, minimum of three views
(For pelvimetry, see 74710)
- 72192 Computerized axial tomography, pelvis; without contrast material(s)
- 72193 with contrast material(s)
- 72194 without contrast material, followed by contrast material(s) and further sections
(For coronal, sagittal, and/or oblique sections, see 76375)
- 72200 Radiologic examination, sacroiliac joints; less than three views
- 72202 three or more views
- 72220 Radiologic examination, sacrum and coccyx, minimum of two views
- 72241 Myelography, cervical; complete procedure
- 72256 Myelography, thoracic; complete procedure
- 72266 Myelography, lumbosacral; complete procedure
- 72271 Myelography, entire spinal canal; complete procedure
- 72286 Diskography, cervical; complete procedure
- 72296 Diskography, lumbar; complete procedure

BR

60.0
70.0

BR

120.0
120.0
120.0

5.0
6.4
8.0

BR
BR
BR

5.0
8.0
6.4
18.0
18.0

18.0
30.0
20.0
20.0

WAC 296-23A-246 Upper extremities.

- 73000 Radiologic examination; clavicle, complete 4.8
- 73010 scapula, complete 6.0
- 73020 Radiologic examination, shoulder; one view 4.0
- 73030 complete, minimum of two views 6.0
- 73041 Radiologic examination, shoulder, arthrography; complete procedure 10.0
- 73050 Radiologic examination; acromioclavicular joints, bilateral, with or without weighted distraction 7.0
- 73060 humerus, minimum of two views 4.8
- 73070 Radiologic examination, elbow; anteroposterior and lateral views 4.8
- 73080 complete, minimum of three views 6.0
- 73086 Radiologic examination, elbow, arthrography; complete procedure 10.0
- 73090 Radiologic examination; forearm, anteroposterior and lateral views 4.8
- 73100 Radiologic examination, wrist; anteroposterior and lateral views 4.0
- 73110 complete, minimum of three views 6.0
- 73116 Radiologic examination, wrist, arthrography; complete procedure 10.0
- 73120 Radiologic examination, hand; two views 4.0
- 73130 minimum of three views 6.0
- 73140 Radiologic examination, finger or fingers, minimum of two views 3.6
- 73200 Computerized axial tomography, upper extremity; without contrast material 58.0
- 73201 with contrast material(s) 64.0
- 73202 without contrast material, followed by contrast material(s) and further sections 71.0
- 73220 Magnetic resonance (e.g., proton) imaging, upper extremity 120.0

WAC 296-23A-248 Lower extremities.

- 73500 Radiologic examination, hip; unilateral, one view 5.0
- 73510 complete, minimum of two views 7.0
- 73520 Radiologic examination, hips, bilateral, minimum of two views of each

Unit Value

Unit Value

		Unit Value	WAC 296-23A-250 Abdomen.	Unit Value
	hip, including anteroposterior view of pelvis	9.6		
73526	Radiologic examination, hip, arthrography; complete procedure	BR	74000 Radiologic examination, abdomen; single anteroposterior view	6.0
73530	Radiologic examination, hip, during operative procedure	16.0	74010 anteroposterior and additional oblique and cone views	8.0
	(73531 has been deleted. To report, use 73530)		74020 complete, including decubitus and/or erect views	11.0
73550	Radiologic examination, femur, anteroposterior and lateral views	6.0	74022 complete acute abdomen series, including supine, erect, and/or decubitus views, upright PA chest	BR
73560	Radiologic examination, knee; anteroposterior and lateral views	4.4	74150 Computerized axial tomography, abdomen; without contrast material	77.0
73562	anteroposterior and lateral, with oblique(s), minimum of three views	6.4	74160 with contrast material(s)	84.0
73564	complete, including oblique(s), and/or tunnel, and/or patellar, and/or standing views	8.4	74170 without contrast material, followed by contrast material(s) and further sections	90.0
	(73570 Minimum of three views has been deleted. Report using 73562, 73564)		(For coronal, sagittal, and/or oblique sections, see 76375)	
73581	Radiologic examination, knee, arthrography; complete procedure	16.0	74181 Magnetic resonance (e.g., proton) imaging, abdomen	120.0
73590	Radiologic examination; tibia and fibula, anteroposterior and lateral views	4.8	[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-250, filed 1/8/87.]	
73592	lower extremity, infant, minimum of two views	4.0	WAC 296-23A-252 Gastrointestinal tract.	Unit Value
73600	Radiologic examination, ankle; anteroposterior and lateral views	4.4	74210 Radiologic examination; pharynx and/or cervical esophagus	8.8
73610	complete, minimum of three views	6.0	74220 esophagus	8.8
73616	Radiologic examination, ankle, arthrography; complete procedure	10.0	74230 Swallowing function, pharynx and/or esophagus, with cineradiography and/or video	12.0
73620	Radiologic examination, foot; anteroposterior and lateral views	4.0	74235 Removal of foreign body(s), esophageal, with use of balloon catheter under fluoroscopic guidance	BR
73630	complete, minimum of three views	5.6	74240 Radiologic examination, gastrointestinal tract, upper; with or without delayed films, without KUB	14.0
73650	Radiologic examination; calcaneus, minimum of two views	4.4	74241 with or without delayed films, with KUB	15.2
73660	toe or toes, minimum of two views	3.6	74245 with small bowel, includes multiple serial films	17.6
73700	Computerized axial tomography, lower extremity; without contrast material	58.0	74246 Radiologic examination, gastrointestinal tract, upper, air contrast, with specific high density barium, effervescent agent, with or without delayed films, without KUB	BR
73701	with contrast material(s)	64.0	74247 with or without delayed film, with KUB	BR
73702	without contrast materials, followed by contrast material(s) and further sections	71.0	74249 with small bowel follow through	BR
	(For coronal, sagittal, and/or oblique sections, see 76375)		74250 Radiologic examination, small bowel, includes multiple serial	
73720	Magnetic resonance (e.g., proton) imaging, lower extremity	120.0		

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-248, filed 1/8/87.]

WAC 296-23A-256 Gynecological and obstetrical.

	Unit Value		Unit Value
		75606	Aortography, thoracic, by serialography; complete procedure 30.0
(For abdomen and pelvis, see 74000-74170, 72170-72190)		75621	Aortography, abdominal, translumbar, without serialography; complete procedure 32.0
74710 Pelvimetry, with or without placental localization 10.0		75623	Aortography, abdominal, catheter, without serialography; complete procedure 32.0
74720 Radiologic examination, abdomen, for fetal age, fetal position and/or placental localization; single view 4.0		75626	Aortography, abdominal, translumbar, by serialography; complete procedure 40.0
74725 multiple views 6.0		75628	Aortography, abdominal, catheter, by serialography; complete procedure 48.0
74731 Placentography with contrast cystography; complete procedure BR		75631	Aortography, abdominal plus bilateral iliofemoral lower extremity, catheter, by serialography; complete procedure BR
74741 Hysterosalpingography; complete procedure 10.8		75651	Angiography, cervicocerebral, catheter, including vessel origin; complete procedure 40.0
(74460, 74461 have been deleted. To report, use 76499)		75653	Angiography, cervicocerebral, selective catheter, including vessel origin; one vessel, complete procedure 36.0
74775 Perincogram (e.g., vaginogram, for sex determination or extent of anomalies) BR		75655	two vessels, complete procedure 38.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23A-256, filed 7/23/87; 87-03-005 (Order 86-47), § 296-23A-256, filed 1/8/87.]

WAC 296-23A-258 Vascular system.

	Unit Value		Unit Value
HEART			
75501 Angiocardiology by cineradiography; complete procedure 22.0		75657	three or four vessels, complete procedure 40.0
75506 Angiocardiology by serialography, single plane; complete procedure 23.0		75659	Angiography, brachial, retrograde; complete procedure 40.0
75509 Angiocardiology by serialography, multiplane; complete procedure 46.0		75661	Angiography, external carotid, cerebral, unilateral, selective; complete procedure 40.0
(75510, 75511 CO2 or positive contrast angiocardiology has been deleted. To report, use 76499)		75663	Angiography, external carotid, cerebral, bilateral, selective; complete procedure 50.0
75520 Cardiac radiography, selective cardiac catheterization, right side; complete procedure 43.0		75667	Angiography, carotid, cerebral, unilateral; direct puncture, complete procedure 40.0
75524 Cardiac radiography, selective cardiac catheterization, left side; complete procedure 21.5		75669	catheter, complete procedure 46.0
75528 Cardiac radiography, selective cardiac catheterization, right and left side; complete procedure 55.0		75672	Angiography, carotid, cerebral, bilateral; direct puncture, complete procedure 50.0
75552 Magnetic resonance (e.g., proton) imaging, myocardium 120.0		75673	catheter, complete procedure 54.0
AORTA AND ARTERIES			
75601 Aortography, thoracic, without serialography; complete procedure 20.0		75677	Angiography, carotid, cervical, unilateral; direct puncture, complete procedure 40.0
		75678	catheter, complete procedure 46.0
		75681	Angiography, carotid, cervical, bilateral; direct puncture, complete procedure 50.0
		75682	catheter, complete procedure 54.0
		75686	Angiography, vertebral; direct puncture, complete procedure 40.0
		75687	catheter, complete procedure 46.0
		75691	Angiography, vertebral, cervical, unilateral; direct puncture, complete procedure 40.0
		75692	catheter, complete procedure 46.0

	Unit Value		Unit Value		
75696	Angiography, vertebral, cervical, bilateral; direct puncture, complete procedure	50.0	ventricular and supra-ventricular angiogram and pressure recording; complete procedure	80.0	
75697	catheter, complete procedure	54.0	75757	Angiography, internal mammary; complete procedure	40.0
75706	Angiography, spinal, selective; complete procedure	28.0	75764	Angiography, coronary bypass, unilateral selective injection; complete procedure	BR
75711	Angiography, extremity, unilateral; without serialography, complete procedure	30.0	75767	Angiography, coronary bypass, multiple selective injection; complete procedure	BR
75712	by serialography, complete procedure	32.0	75775	Angiography, coronary bypass, selective, each additional vessel studied after basic examination; complete procedure	BR
75717	Angiography, extremity, bilateral; without serialography, complete procedure	32.0	75790	Angiography, arteriovenous shunt (e.g., dialysis patient)	BR
75718	by serialography, complete procedure	34.0			
75723	Angiography, renal, unilateral, selective, (including flush aortogram); complete procedure	40.0		VEINS AND LYMPHATICS	
75725	Angiography, renal, bilateral, selective, (including flush aortogram); complete procedure	60.0	75802	Lymphangiography, extremity only, unilateral; complete procedure	25.0
75727	Angiography, visceral; selective with or without flush aortogram), complete procedure	46.0	75804	Lymphangiography, extremity only, bilateral; complete procedure	35.0
75728	supraselective, complete procedure	48.0	75806	Lymphangiography, pelvic/abdominal, unilateral; complete procedure	35.0
	(For selective angiography, additional visceral vessels studied after basic examination, see 75773)		75808	Lymphangiography, pelvic/abdominal, bilateral; complete procedure	35.0
75732	Angiography, adrenal, unilateral, selective; complete procedure	46.0	75811	Splenoportography; complete procedure	40.0
75734	Angiography, adrenal, bilateral, selective; complete procedure	48.0	75821	Venography, extremity, unilateral; complete procedure	16.0
75737	Angiography, pelvic; selective, complete procedure	44.0	75823	Venography, extremity, bilateral; complete procedure	26.0
75738	supraselective, complete procedure	46.0	75826	Venography, caval, inferior, with serialography; complete procedure	32.0
75742	Angiography, pulmonary, unilateral, selective; complete procedure	30.0	75828	Venography, caval, superior, with serialography; complete procedure	35.0
75744	Angiography, pulmonary, bilateral, selective; complete procedure	50.0	75832	Venography, renal, unilateral, selective; complete procedure	40.0
75747	Angiography, pulmonary; by catheter, nonselective, complete procedure	30.0	75834	Venography, renal, bilateral, selective; complete procedure	45.0
75748	venous injection, complete procedure	40.0	75841	Venography, adrenal, unilateral, selective; complete procedure	30.0
75751	Angiography, coronary, root injection; complete procedure	60.0	75843	Venography, adrenal, bilateral, selective; complete procedure	32.0
75753	Angiography, coronary, unilateral selective injection, including left ventricular and supra-ventricular angiogram and pressure recording; complete procedure	70.0	75846	Venography, azygos; selective, complete procedure	30.0
75755	Angiography, coronary, bilateral selective injection, including left		75847	nonselective, complete procedure	28.0
			75851	Venography, intraosseous; complete procedure	32.0
			75861	Venography, sinus or jugular, catheter; complete procedure	32.0
			75871	Venography, superior sagittal sinus; complete procedure, including direct puncture	32.0
			75873	Venography, epidural; complete procedure	BR

	Unit Value		Unit Value
76087 Mammary ductogram or galactogram, single duct; complete procedure	15.8	76366 Computerized tomography guidance for cyst aspiration; complete procedure	BR
76089 Mammary ductogram or galactogram, multiple ducts; complete procedure	26.5	76370 Computerized tomography guidance for placement of radiation therapy fields	BR
76090 Mammography, unilateral	8.8	76375 Computerized tomography, coronal, sagittal, multiplanar, and/or oblique reconstruction	23.5
76091 bilateral	13.2	76400 Magnetic resonance (e.g., proton) imaging, bone marrow blood supply	120.0
(For xeromammography, list 76150 in addition to code for mammography)		76499 Unlisted diagnostic radiologic procedure	BR
76096 Localization of breast nodule or calcification; before operation, with marker and confirmation of its position with appropriate imaging (e.g., ultrasound or radiologic)	14.6		
76097 each additional localization	7.3	[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23A-260, filed 7/23/87; 87-03-005 (Order 86-47), § 296-23A-260, filed 1/8/87.]	
76098 Radiologic examination, breast surgical specimen	BR	WAC 296-23A-262 Diagnostic ultrasound.	
76100 Radiologic examination, single plane body section, (e.g., tomography), other than kidney	13.2	Notes	
76101 Radiologic examination, complex motion (i.e., hypercycloidal) body section (e.g., mastoid polytomography), other than kidney; unilateral	19.3	A-mode: Implies a one-dimensional ultrasonic measurement procedure	
76102 bilateral	35.0	M-mode: Implies a one-dimensional ultrasonic measurement procedure with movement of the trace to record amplitude and velocity of moving echo-producing structures	
(For nephrotomography, see 74415)		B-scan: Implies a two-dimensional ultrasonic scanning procedure with a two-dimensional display	
76120 Cineradiography, except where specifically included	13.2	Real-time scan: Implies a two-dimensional ultrasonic scanning procedure with display of both two-dimensional structure and motion with time	
76125 Cineradiography to complement routine examination	7.0		Unit Value
(76127 has been deleted. The use of photographic media is not reported separately but is considered to be a component of the basic procedure)			
(76130-76137 have been deleted. To report, use code for specific radiologic examination)		HEAD AND NECK	
76150 Xeroradiography	6.0	76500 Echoencephalography, A-mode, diencephalic midline	7.7
(76300 has been deleted. For thermography of the breast, use 76499)		(76505 has been deleted. To report complete A-mode echoencephalography, use 76999)	
76350 Subtraction in conjunction with contrast studies	BR	76506 Echoencephalography, B-scan and/or real time with image documentation (gray scale) (for determination of ventricular size, delineation of cerebral contents and detection of fluid masses or other intracranial abnormalities), including A-mode encephalography as secondary component where indicated	BR
76355 Computerized tomography guidance for stereotactic localization	BR		
76361 Computerized tomography guidance for needle biopsy; complete procedure	BR		

	Unit Value		Unit Value
76511			
ABDOMEN AND RETROPERITONEUM			
Ophthalmic ultrasound, echography; A-mode spectral analysis with amplitude quantitation	22.9	76700	Echography, abdominal, B-scan and/or real time with image documentation; complete study
76512 contact B-scan	22.9		22.9
(76515 has been deleted. To report, use 76999)		76705	limited (e.g., single organ, quadrant, follow-up)
76516 Ophthalmic biometry by ultrasound echography, A-mode	15.4		15.4
(76517 has been deleted. To report, use 76999)		76770	Echography, retroperitoneal (e.g., renal, aorta, nodes) B-scan and/or real time with image documentation; complete
76519 with intraocular lens power calculation	BR		22.9
76529 Ophthalmic ultrasound foreign body localization	BR	76775	limited
(76530 has been deleted. To report A-mode echography of thyroid, use 76999)			19.2
(76535 has been deleted. To report, use 76536)		PELVIS	
76536 Echography, soft tissues of head and neck (e.g., thyroid, parathyroid, parotid), B-scan and/or real time with image documentation	BR	76805	Echography, pregnant uterus, B-scan and/or real time with image documentation; complete
			21.2
		76815	limited (fetal growth rate, heart beat, anomalies, placental location)
			9.7
		76816	follow-up or repeat (e.g., for follicles)
			BR
		75818	Fetal biophysical profile
			BR
		76825	Echocardiography, fetal heart in utero
			BR
		76855	Echography, pelvic area (Doppler)
			11.4
		76856	Echography, pelvic (nonobstetric), B-scan and/or real time with image documentation; complete
			BR
		76857	limited or follow-up
			BR
		GENITALIA	
		76870	Echography, scrotum and contents
			BR
		EXTREMITIES	
		76880	Echography, extremity, B-scan and/or real time with image documentation
			BR
		VASCULAR STUDIES	
		76925	Peripheral imaging, B-scan, Doppler or real-time scan
			BR
		ULTRASONIC GUIDANCE PROCEDURES	
		76931	Ultrasonic guidance for pericardiocentesis; complete procedure
			BR
		76935	Ultrasonic guidance for thoracocentesis; complete procedure
			5.0
		76939	Ultrasonic guidance for cyst (any location) or renal pelvis aspiration; complete procedure
			2.0
		76943	Ultrasonic guidance for needle biopsy; complete procedure
			6.0
		76945	Ultrasonic guidance for abscess or collection drainage; complete procedure
			BR
		76947	Ultrasonic guidance for amniocentesis; complete procedure
			6.0

	Unit Value	
76950	17.1	Echography for placement of radiation therapy fields, B-scan
76960	14.3	Ultrasonic guidance for placement of radiation therapy fields, except for B-scan echography
MISCELLANEOUS		
76970	10.0	Ultrasound study follow-up (specify) (76980 has been deleted. To report, use code for specific ultrasound examination) (76985 has been deleted. To report, use 76986)
76986	BR	Echography, intraoperative (76990 has been deleted. To report, use 76999)
76991	BR	Intraluminal ultrasound study (e.g., transrectal, transvesical)
76999	BR	Unlisted ultrasonic procedure

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23A-262, filed 7/23/87; 87-03-005 (Order 86-47), § 296-23A-262, filed 1/8/87.]

WAC 296-23A-264 Therapeutic radiology. Listings of therapeutic radiology provide for teletherapy and brachytherapy to include initial consultation, clinical treatment planning, simulation, medical radiation physics, dosimetry, treatment devices, special services, and clinical treatment management procedures. They include normal follow-up care during course of treatment and for three months following its completion.

77299		Unlisted procedure, therapeutic radiology clinical treatment planning
77399		Unlisted procedure, medical radiation physics, dosimetry and treatment devices
77499		Unlisted procedure, therapeutic radiology clinical treatment management
77799		Unlisted procedure, clinical brachytherapy

(For treatment by injectable or ingestible isotopes, see subsection NUCLEAR MEDICINE)

CONSULTATION: CLINICAL MANAGEMENT

Preliminary consultation, evaluation of patient prior to decision to treat, or full medical care (in addition to treatment management) when provided by the therapeutic radiologist may be identified by the appropriate procedure codes from medicine or surgery sections.

CLINICAL TREATMENT PLANNING (EXTERNAL AND INTERNAL SOURCES)

The clinical treatment planning process is a complex service including interpretation of special testing, tumor localization, treatment volume determination, treatment time/dosage determination, choice of treatment modality, determination of number and size of treatment ports, selection of appropriate treatment devices, and other procedures.

DEFINITIONS:

Simple—planning requiring single treatment area of interest encompassed in a single port or simple parallel opposed ports with simple blocking.

Intermediate—planning requiring three or more converging ports, two separate treatment areas, special blocking, or special time dose constraints.

Complex—planning requiring highly complex blocking, tangential ports, special wedges or compensators, three or more separate treatment areas, rotational or special beam considerations.

(Procedures 77260, 77265, 77270, 77275 have been deleted. To report, use 77261-77263)

	Unit Value	
Bill procedure codes 77261-77299 only if a technical component has been performed.		
77261		Therapeutic radiology treatment planning; simple BR
77262		intermediate BR
77263		complex BR
77280		Therapeutic radiology simulation-aided field setting (requiring simulator, with or without fluoroscopy); simple BR
77285		intermediate BR
77290		complex BR
77299		Unlisted procedure, therapeutic radiology clinical treatment planning BR

MEDICAL RADIATION PHYSICS, DOSIMETRY, TREATMENT DEVICES AND SPECIAL SERVICES

77300		Basic radiation dosimetry calculation, central axis depth dose, TDF, NSD, gap calculation off axis factor, tissue inhomogeneity factors, as required during course of treatment 4.0
77305		Teletherapy, isodose plan (whether hand or computer calculated); simple (one or two parallel opposed unmodified ports directed to a single area of interest) 3.0
77310		intermediate (three or more treatment ports directed to a single area of interest) 4.0
77315		complex (mantle or inverted Y,

	Unit Value		Unit Value
tangential ports, the use of wedges, compensators, complex rotational blocking or special beam considerations)	6.0	Complex—three or more separate treatment areas, highly complex blocking (mantle, inverted Y, tangential ports, wedges, compensators, or other special beam considerations).	
(Procedures 77320, 77325, 77330, 77335, 77340 have been deleted. To report, use 77300–77399 as appropriate)		Bill procedure codes 77400–77499 only if a technical component has been performed.	
77321 Special teletherapy port plan, particles, hemi-body, total body	BR	77400 Daily megavoltage treatment management; simple	2.0
77326 Brachytherapy isodose calculation; simple (calculation made from single plane, one to four source/ribbon application)	BR	77405 intermediate	3.0
77327 intermediate (multiplane dosage calculations, application involving five to ten sources/ribbons)	BR	77410 complex	4.0
77328 complex (multiplane isodose plan, volume implant calculations, over ten sources/ribbons used, special spatial reconstruction)	BR	77415 Therapeutic radiology treatment port film interpretation and verification, per treatment course	3.0
77331 Special dosimetry (e.g., TLD, microdosimetry) (specify)	BR	77420 Weekly megavoltage treatment management; simple	4.0
77332 Treatment devices, design and construction; simple (simple block, simple bolus)	BR	77425 intermediate	5.0
77333 intermediate (multiple blocks, stents, bite blocks, special bolus)	BR	77430 complex	6.0
77334 complex (irregular blocks, special shields, compensators, wedges, molds or casts)	BR	(Procedures 77435–77460 have been deleted. To report, use 77400–77499 as appropriate)	
77336 Continuing medical radiation physics consultation in support of therapeutic radiologist, including continuing quality assurance	BR	77465 Daily kilovoltage treatment management	2.0
(Procedures 77345–77360 have been deleted. To report, use 77300–77399 as appropriate)		77470 Special treatment procedure (e.g., total body irradiation, hemibody irradiation)	BR
77370 Special medical radiation physics consultation	BR	(77470 assumes that the procedure be performed one or more times during the course of therapy, in addition to daily or weekly patient management)	
77399 Unlisted procedure, medical radiation physics, dosimetry and treatment devices	BR	77499 Unlisted procedure, therapeutic radiology clinical treatment management	BR

HYPERTHERMIA

Hyperthermia treatments as listed in this section include external (superficial and deep) and interstitial. Radiation therapy when given concurrently is listed separately.

Hyperthermia is used only as an adjunct to radiation therapy or chemotherapy. It may be induced by a variety of sources, e.g., microwave, ultrasound, low energy radio-frequency conduction, or by probes.

The listed treatments include management during the course of therapy and follow-up care for three months after completion. Preliminary consultation is not included (see WAC 296-21-030). Physics planning and interstitial insertion of temperature sensors, and use of external or interstitial heat generating sources are included.

The following descriptors are included in the treatment schedule:

77600 Hyperthermia, externally generated; superficial (i.e., heating to a depth of 4 cm or less)	BR
77605 deep (i.e., heating to depths	

CLINICAL TREATMENT MANAGEMENT

Except where specified, assumes a treatment on a daily basis (4 or 5 fractions per week) with the use of megavoltage photon or high energy particle sources. Daily and weekly clinical treatment management are mutually exclusive for the same dates.

DEFINITIONS: Simple—single treatment area, single port or parallel opposed ports, simple blocks.

Intermediate—two separate treatment areas, three or more ports on a single treatment area, use of special blocks.

	greater than 4 cm)	BR
77610	Hyperthermia generated by interstitial probe(s); 5 or fewer interstitial applicators	BR
77615	more than 5 interstitial applicators	BR

CLINICAL BRACHYTHERAPY

Clinical brachytherapy requires the use of either natural or man-made radioelements applied into or around a treatment field of interest.

DEFINITIONS: (Sources refer to intracavitary placement or permanent interstitial placement; ribbons refer to temporary interstitial placement)

- Simple—application with one to four sources/ribbons
- Intermediate—application with five to ten sources/ribbons
- Complex—application with greater than ten sources/ribbons

(Procedures 77600-77699 have been deleted. To report, use 77332-77334 or 77399 as appropriate)

(Procedures 77700-77749 have been deleted. To report, use 77761-77799 as appropriate)

77750	Infusion or instillation of radioelement solution	12.5
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(Procedures 77755-77785 have been deleted. To report, use 77761-77799 as appropriate)

77761	Intracavitary radioelement application; simple	BR
77762	intermediate	BR
77763	complex	BR
77776	Interstitial radioelement application; simple	BR
77777	intermediate	BR
77778	complex	BR
77789	Surface application of radioelement	24.75
77790	Supervision, handling, loading of radioelement	33.5
77799	Unlisted procedure, clinical brachytherapy	BR

(Procedure 77800 has been deleted. To report, use 77331)

(Procedures 77805-77810 have been deleted. To report, use 77305-77321 or 77326-77328 as appropriate)

(Procedure 77850 has been deleted. To report, use 77300, 77336, 77370)

(Procedure 77860 has been deleted. To report, use 77336)

(Procedure 77999 has been deleted. To report, use 77399)

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-264, filed 1/8/87.]

WAC 296-23A-266 Nuclear medicine.

Notes: Listed procedures may be performed independently or in the course of overall medical care.

Radioimmunoassay tests are found in the clinical pathology section (codes 82000-84999). These codes can be appropriately used by any specialist performing such tests in a laboratory licensed and/or certified for radioimmunoassays. The reporting of these tests is not confined to clinical pathology laboratories alone.

DIAGNOSTIC

ENDOCRINE SYSTEM

		Unit Value
78000	Thyroid uptake, single determination	6.0
78001	multiple determinations	8.0
78003	stimulation suppression or discharge (not including initial uptake studies)	9.0
78006	Thyroid imaging, with uptake; single determination	16.0
78007	multiple determinations	18.0
78010	Thyroid imaging; only	10.0
78011	with vascular flow	BR
78015	Thyroid carcinoma metastases imaging; limited area (e.g., neck and chest only)	20.0
78016	with additional studies (e.g., urinary recovery)	25.0
78017	multiple areas	BR
78018	whole body	BR

(For triiodothyronine (true TT-3), RIA, see 84480)

(For calcitonin, RIA, see 82308)

(For triiodothyronine, fee (FT-3), RIA (unbound T-3 only), see 84481)

(For T-4 thyroxine, CPB or resin uptake, see 84435)

(For TT-4 thyroxine, RIA, see 84436)

(For T-4 thyroxine, neonatal, see 84437)

(For FT-4 thyroxine, fee, RIA (unbound T-4 only), see 84439)

(78070 has been deleted. To report parathyroid imaging, use 78099)

(For parathormone (parathyroid hormone), RIA, see 83970)

78075	Adrenal cortical imaging	BR
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	Unit Value		Unit Value
(For adrenal cortex antibodies, RIA, see 86681)		(For luteinizing releasing factor (LRH), RIA, see 83727)	
(For cortisol, RIA, plasma, see 82533)		(For prolactin level (mammotropin), RIA, see 84146)	
(For cortisol, RIA, urine, see 82534)		(For oxytocin level, (oxytocinase), RIA, see 83949)	
(For aldosterone, double isotope technique, see 82087)		(For vasopressin level (antidiuretic hormone), RIA, see 84588)	
(For aldosterone, RIA, blood, see 82088)		(For estradiol, RIA, see 82670)	
(For aldosterone, RIA, urine, see 82089)		(For progesterone, RIA, see 84144)	
(For 17-ketosteroids, RIA, see 83588)		(For testosterone, blood, RIA, see 84403)	
(For 17-OH ketosteroids, RIA, see 83599)		(For testosterone, urine, RIA, see 84405)	
(For 17-hydroxycorticosteroids, RIA, see 83491)		(For etiocholanolone, RIA, see 82696)	
(For insulin, RIA, see 83525)		78099 Unlisted endocrine procedure, diagnostic nuclear medicine	BR
(For insulin antibodies, RIA, see 86337)		(For chemical analysis, RIA tests, see Chemistry and Toxicology section)	
(For insulin factor antibodies, RIA, see 86338)			
(For proinsulin, RIA, see 84206)		HEMATOPOIETIC, RETICULOENDOTHELIAL AND LYMPHATIC SYSTEM	
(For glucagon, RIA, see 82943)		78102 Bone marrow imaging; limited area	BR
(For adrenocorticotrophic hormone (ACTH), RIA, see 82024)		78103 multiple areas	BR
(For human growth hormone (HGH), (somatotropin), RIA, see 83003)		78104 whole body	BR
(For human growth antibody, RIA, see 86277)		78110 Blood or plasma volume, radionuclide-dilution technique; (separate procedure) single sampling	8.0
(For thyroglobulin antibody, RIA, see 86800)		78111 multiple samplings	BR
(For thyroid microsomal antibody, RIA, see 86376)		(For dye method, see 84605, 84610)	
(For thyroid stimulating hormone (TSH), RIA, see 84443)		78120 Red cell volume determination (separate procedure) single sampling	12.0
(For thyrotropin releasing factor, RIA, see 84444)		78121 multiple samplings	BR
(For plus long-acting thyroid stimulator (LATS), see 84445)		78122 Whole blood volume determination including separate measurement of plasma volume and red cell volume (radionuclide volume-dilution technique)	8.0
(For follicle stimulating hormone (FSH component of pituitary gonadotropin), RIA, see 83001)		(For dye method, see 84610)	
(For luteinizing hormone (LH component of pituitary gonadotropin), (ICSH), RIA, see 83002)		78130 Red cell survival study	20.0
		78135 with splenic and/or hepatic sequestration	30.0
		78140 Red cell splenic and/or hepatic sequestration	20.0
		78160 Plasma radioiron disappearance (turnover) rate	16.0
		78162 Radioiron oral absorption	BR

	Unit Value		Unit Value
78170			
78172	24.0		
		GASTROINTESTINAL SYSTEM	
	BR	78201	Liver imaging; static only 20.0
		78202	with vascular flow 25.0
			(For spleen imaging only, use 78185 and 78186)
		78215	Liver and spleen imaging; static only 25.0
		78216	with vascular flow 30.0
		78220	Liver function study with hepatobiliary agents; with serial images 20.0
			(78221 has been deleted. To report liver function study with probe technique, use 78299)
		78223	Hepatobiliary ductal system imaging, including gallbladder BR
		78225	Liver-lung imaging (e.g., subphrenic abscess) BR
		78230	Salivary gland imaging 14.0
		78231	with serial images 16.0
		78232	Salivary gland function study BR
			(78240 has been deleted. To report pancreas imaging, use 78299)
		78258	Esophageal motility BR
		78261	Gastric mucosa imaging BR
		78262	Gastroesophageal reflux study BR
		78264	Gastric emptying study BR
		78270	Vitamin B-12 absorption studies (e.g., Schilling test); without intrinsic factor (e.g., Schilling test) 10.0
		78271	with intrinsic factor (e.g., Schilling test) 20.0
		78272	Vitamin B-12 absorption studies combined, with and without intrinsic factor 25.0
		78276	Gastrointestinal aspirate blood loss localization BR
		78278	Acute gastrointestinal blood loss imaging BR
		78280	Gastrointestinal blood loss study 16.0
		78282	Gastrointestinal protein loss 12.0
			(78285, 78286 have been deleted. To report gastrointestinal fat or fatty acid absorption studies, use 78299)
			(For gastrin, RIA, see 82941)
			(For intrinsic factor level, see 83528)
			(For carcinoembryonic antigen level (CEA), RIA, see 86151)
		78290	Bowel imaging (e.g., ectopic gastric mucosa, Meckel's localization, volvulus) 20.0
78185	20.0		
			(If combined with liver study, use procedures 78215 and 78216)
78186	25.0		
78191	BR		
78192	BR		
78193	BR		
78195	BR		
78199	BR		
			(For chemical analysis, RIA tests, see Chemistry and Toxicology section)

	Unit Value		Unit Value
78291 Peritoneal-venous shunt patency test (e.g., for LeVeen shunt)	BR	78411 Cardiac blood pool imaging by first pass technique, with determination of global or regional ventricular function (specify right, left, or both) including but not necessarily limited to ejection fraction and wall motion, at rest	BR
78299 Unlisted gastrointestinal procedure, diagnostic nuclear medicine (For chemical analysis, RIA tests, see Chemistry and Toxicology section)	BR	78412 with exercise and/or pharmacologic intervention, including but not necessarily limited to continuous vital signs and ECG monitoring, and treadmill or bicycle exercise for cardiovascular stress at submaximal or maximal levels	BR
MUSCULOSKELETAL SYSTEM			
(Bone and joint imaging can be used in the diagnosis of a variety of infectious inflammatory diseases, e.g., osteomyelitis, as well as for localization of primary and/or metastatic neoplasms)			
78300 Bone imaging, limited area (e.g., skull, pelvis)	25.0	(78413 has been deleted. To report, use 78411)	
78305 multiple areas	40.0	(78405, 78406 Myocardium imaging has been deleted. To report, use 78418-78424)	
78306 whole body	48.2		
78310 vascular flow only	BR	78414 Determination of ventricular ejection fraction with probe technique .	BR
78315 by three phase technique	BR	78415 Cardiac blood pool imaging, functional imaging (e.g., phase and amplitude analysis)	BR
78350 Bone density (bone mineral content) study; single photon absorpionmetry	BR	78418 Myocardium imaging, regional myocardial perfusion at rest	BR
78351 dual photon absorpionmetry	BR	78419 with exercise and/or pharmacological intervention, including but not necessarily limited to continuous vital signs and ECG monitoring, and treadmill or bicycle exercise for cardiovascular stress at submaximal or maximal levels	BR
78380 Joint imaging; limited area	BR		
78381 multiple areas	BR		
78399 Unlisted musculoskeletal procedure, diagnostic nuclear medicine	BR		
CARDIOVASCULAR SYSTEM			
(78401 has been deleted. To report, see 78402-78415)			
78402 Cardiac blood pool imaging with vascular flow assessment (sequential imaging with or without time activity curve evaluation)	25.0	78420 Myocardium imaging; with quantitative evaluation (e.g., pharmacokinetic temporal assessment)	BR
78403 Cardiac blood pool imaging by gated equilibrium blood pool technique, with determination of global or regional ventricular function (specify right, left, or both) including but not necessarily limited to ejection fraction and wall motion, at rest	BR	78422 for evaluation of infarction (infarct avid imaging)	BR
78404 with exercise and/or pharmacologic intervention, including but not necessarily limited to continuous vital signs and ECG monitoring, and treadmill or bicycle exercise for cardiovascular stress at submaximal or maximal levels	BR	78424 regional myocardial perfusion (redistribution resting or postexercise study)	BR
78407 with determination of ventricular volume (specify right, left, or both)	BR	78425 Cardiac regurgitant index	BR
		78428 Cardiac shunt detection	BR
		78435 Cardiac flow imaging (i.e., angiocardigraphy)	BR
		78445 Vascular flow imaging (i.e., angiography, venography)	BR
		78455 Venous thrombosis study (e.g., radioactive fibrinogen)	BR
		78457 Venous thrombosis imaging (e.g., venogram); unilateral	BR
		78458 bilateral	BR
		78470 Cardiac output	BR
		(78490 has been deleted. To report tissue clearance studies, use 78499)	

	Unit Value		Unit Value
(For digoxin, RIA, see 82643)		78655 Eye tumor identification	BR
(For digitoxin (digitalis), RIA, see 82640)		78660 Dacryocystography (lacrima flow study)	BR
(For cerebral blood flow study, see 78615)		78699 Unlisted nervous system procedure, diagnostic nuclear medicine	BR
GENITOURINARY SYSTEM			
78499 Unlisted cardiovascular procedure, diagnostic nuclear medicine	BR	78700 Kidney imaging; only	18.0
(For chemical analysis, RIA tests, see Chemistry and Toxicology section)		78701 with vascular flow	20.0
		78704 with function study (i.e., imaging renogram)	23.0
		78707 with vascular flow and function study	30.0
		78715 Kidney vascular flow only	BR
		78725 Kidney function study only	BR
		78726 with pharmacological intervention	BR
		(For renin (angiotensin I), RIA, see 84244)	
		(For angiotensin II, RIA, see 82163)	
		(For beta-2 microglobulin, RIA, see 82231, 82232)	
		78727 Kidney transplant evaluation	BR
		78730 Urinary bladder residual study	BR
		78740 Ureteral reflux study (radionuclide voiding cystogram)	BR
		(For estradiol, RIA, see 82670)	
		(For estriol, RIA, see 82677)	
		(For progesterone, RIA, see 84144)	
		(For prostatic acid phosphatase, RIA, see 84066)	
		78760 Testicular imaging	BR
		78761 with vascular flow	BR
		(For testosterone, blood, RIA, see 84403)	
		(For testosterone, urine, RIA, see 84405)	
		(78770, 78775 have been deleted. To report either placenta imaging or placenta localization, use 78799)	
		(For lactogen, human placental (HPL) chorionic somatomammotropin, RIA, see 83632)	
		(For chorionic gonadotropin, RIA, see 82998)	
		(For chorionic gonadotropin beta subunit, RIA, see 84701)	
RESPIRATORY SYSTEM			
78580 Pulmonary perfusion imaging; particulate	26.0		
78581 gaseous	BR		
78582 gaseous, with ventilation, rebreathing and washout	BR		
78584 Pulmonary perfusion imaging, particulate, with ventilation; single breath	BR		
78585 rebreathing and washout, with or without single breath	1.6		
78586 Pulmonary ventilation imaging, aerosol; single projection	BR		
78587 multiple projections (e.g., anterior, posterior, lateral views)	BR		
78591 Pulmonary ventilation imaging, gaseous, single breath, single projection	BR		
78593 Pulmonary ventilation imaging, gaseous, with rebreathing and washout with or without single breath; single projection	22.0		
78594 multiple projections (e.g., anterior, posterior, lateral views)	BR		
78599 Unlisted respiratory procedure, diagnostic nuclear medicine	BR		
NERVOUS SYSTEM			
78600 Brain imaging, limited procedure	26.0		
78601 with vascular flow	31.0		
78605 Brain imaging, complete study	30.0		
78606 with vascular flow	35.0		
78610 Brain imaging, vascular flow only	10.0		
78615 Cerebral blood flow, inert radionuclide gas washout	BR		
78630 Cerebrospinal fluid flow, imaging (not including introduction of material); cisternography	35.0		
78635 ventriculography	35.0		
78640 myelography	BR		
78645 shunt evaluation	35.0		
78650 CSF leakage detection and localization	32.0		
(For myelin basic protein, CSF, RIA, see 83873)			

	Unit Value		Unit Value
(For pregnanediol, RIA, see 84135)		(For clonazepam, see 82510)	
(For pregnanetriol, RIA, see 84138)		(For cocaine, quantitative, see 82520)	
78799 Unlisted genitourinary procedure, diagnostic nuclear medicine	BR	(For diazepam, see 82636)	
(For chemical analysis, RIA tests, see Chemistry and Toxicology section)		(For dihydromorphinone, quantitative, see 82649)	
MISCELLANEOUS STUDIES		(For phenytoin (diphenylhydantoin), see 84045)	
(For specific organ, see appropriate heading)		(For flucytosine, see 82741)	
(For radiophosphorus tumor identification, ocular, see 78655)		(For gentamicin, see 84695)	
78800 Tumor localization; limited area . . .	BR	(For lysergic acid diethylamide (LSD), RIA, see 83728)	
(For specific organ, see appropriate heading)		(For morphine (Heroin), RIA, see 83862)	
(For eye tumor identification, see 78655)		(For phencyclidine (PCP), see 83992)	
78801 multiple areas	BR	(For phenobarbital, see barbiturates, 82205, 82210)	
78802 whole body	BR	(For tobramycin, see 84840)	
78805 Abscess localization; limited area . .	BR	(For kanamycin, see 83578)	
78806 whole body	BR	78890 Generation of automated data: Interactive process involving nuclear physician and/or allied health professional personnel; simple manipulations and interpretation, not to exceed 30 minutes	BR
(For imaging bone infectious inflammatory disease, see 78300-78381)		78891 complex manipulations and interpretation, exceeding 30 minutes	BR
(For Rast, see 86421, 86422)		(use 78890 or 78891 in addition to primary procedure)	
(For gamma-E immunoglobulin, RIA, see 82785)		78895 Bedside unit required	BR
(For gamma-G immunoglobulin, see 82784)		(use 78895 in addition to primary procedure)	
(For alpha-1 antitrypsin, RIA, see 86064)		78990 Provision of diagnostic radionuclide(s)	12.0
(For alpha-1 fetoprotein, RIA, see 86244)		78999 Unlisted miscellaneous procedure, diagnostic nuclear medicine	BR
(For antinuclear antibodies, RIA, see 86038)		[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23A-266, filed 7/23/87; 87-03-005 (Order 86-47), § 296-23A-266, filed 1/8/87.]	
(For lactic dehydrogenase, RIA, see 83610)		WAC 296-23A-268 Therapeutic.	
(For amikacin, see 82112)			Unit Value
(For aminophylline, see 82137)		79000 Radionuclide therapy, hyperthyroidism, initial, including evaluation of patient	48.0
(For amitriptyline, see 82138)		79001 subsequent, each therapy	20.0
(For amphetamine, chemical quantitative, see 82145)			
(For chlordiazepoxide, see 82420, 82425)			
(For chlorpromazine, see phenothiazine, urine, 84021, 84022)			

	Unit Value
79020 Radionuclide therapy, thyroid suppression (euthyroid cardiac disease), including evaluation of patient.....	48.0
79030 Radionuclide ablation of gland for thyroid carcinoma	BR
79035 Radionuclide therapy for metastases of thyroid carcinoma	BR
79100 Radionuclide therapy, polycythemia vera, chronic leukemia, each treatment	16.0
79200 Intracavitary radioactive colloid therapy	24.0
79300 Interstitial radioactive colloid therapy	60.0
79400 Radionuclide therapy, nonthyroid, nonhematologic (e.g., for metastases to bone)	BR
79420 Intravascular radionuclide therapy, particulate	BR
79440 Intra-articular radionuclide therapy	BR
79900 Provision of therapeutic radionuclide(s)	BR
79999 Unlisted radionuclide therapeutic procedure	BR

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-268, filed 1/8/87.]

HOSPITAL OUTPATIENT PATHOLOGY AND LABORATORY

WAC 296-23A-300 General information--Hospital outpatient pathology and laboratory. Rules and billing procedures pertaining to all practitioners rendering services to injured workers are presented in the general instructions section beginning with WAC 296-20-010. Some of the similarities are repeated here for the convenience of those hospitals referring to the pathology and laboratory section. Pathology and laboratory fees for nonhospital providers are covered in chapter 296-23 WAC.

The following procedures and fee maximums apply only when these services are performed by or under the supervision of a physician.

Unless otherwise specified, the fee maximums include the collection and handling of the specimens by the laboratory performing the procedure.

The department or self-insurer may deny payment for pathology or laboratory procedures which are determined to be excessive, unrelated, or unnecessary for management of the accepted industrial illness or injury.

The technical component represents the expenses of the nonpathologist personnel, materials, facilities and space, used for diagnostic or therapeutic services rendered.

The professional component represents the professional services supplied by physicians. See WAC 296-

23-200 to 296-23-232 for billing the professional component.

Panel (profile) tests: These are certain multiple tests performed on a single specimen of blood or urine. They are distinguished from the single or multiple test(s) performed on an "individual," "immediate," or "stat" reporting basis.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-300, filed 1/8/87.]

WAC 296-23A-310 Billing procedures. (1) Department billing instructions appear in WAC 296-20-125. Hospital information and billing instructions appear in WAC 296-23A-100, 296-23A-105, and 296-23A-150.

(2) Some pathology and laboratory services contain a professional component. Fee maximums for these services are set for the combined professional and technical components, and the procedure codes for these services are marked with a "*".

All other pathology and laboratory services do not have a professional component. Fee maximums for these services are for the total procedure.

(3) Hospitals are reimbursed only for the technical component at a rate up to and including sixty percent of the fee maximum for the procedure codes with a "*".

All other procedure codes are reimbursed at a rate up to and including one hundred percent of the fee maximum.

(4) Hospitals should bill their usual and customary rates for the technical component of outpatient pathology and laboratory services.

(5) Laboratory procedures performed by other than the billing hospital shall be billed at the value charged the hospital by the reference (outside) laboratory. When possible, the service should be billed under the same procedure code or panel procedure number listed under "PANEL OR PROFILE TESTS" used by the reference laboratory.

(6) Laboratory reports must be attached to the bills for laboratory services.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-310, filed 1/8/87.]

WAC 296-23A-315 Unlisted service or procedure. A pathology or laboratory service or procedure may be provided that is not listed in this section of the fee schedule. When reporting such a service, the appropriate "unlisted procedure" code may be used to indicate the service, identifying it by "special report" as discussed in WAC 296-23A-420. The "unlisted procedures" and accompanying codes for the PATHOLOGY AND LABORATORY section are as follows:

- 80099 Unlisted panel
- 81099 Unlisted urinalysis procedure
- 84999 Unlisted chemistry or toxicology procedure
- 85999 Unlisted hematology procedure
- 86999 Unlisted immunology procedure
- 87999 Unlisted microbiology procedure
- 88099 Unlisted necropsy (autopsy) procedure
- 88199 Unlisted cytopathology procedure

88299	Unlisted cytogenetic procedure		Unit
88399	Unlisted surgical pathology procedure		Value
89399	Unlisted miscellaneous pathology test		

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-315, filed 1/8/87.]

WAC 296-23A-320 Special report. A service that is rarely provided, unusual, variable or new may require a special report in determining medical appropriateness of the service. Pertinent information should include an adequate definition or description of the nature, extent, and need for the procedure; and the time, effort, and equipment necessary to provide the service. Additional items which may be helpful include: Complexity of symptoms, final diagnosis, pertinent physical findings, diagnostic and therapeutic procedures, concurrent problems, and follow-up care.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-320, filed 1/8/87.]

WAC 296-23A-325 Panel or profile tests.

The following list contains those tests that can be and are frequently done as groups and combinations ("profiles") on automated multichannel equipment. For any combination of tests among those listed immediately below, use the appropriate number 80002-80019. Groups of the tests listed here are distinguished from multiple tests performed individually for immediate or "stat" reporting.

The following unit values apply when three or more of the tests listed below are performed on the same blood or urine specimen, under the conditions described in WAC 296-23A-300.

Albumin			
Albumin/globulin ratio			
Bilirubin, direct			
Bilirubin, total			
Calcium			
Carbon dioxide content			
Chlorides			
Cholesterol			
Creatinine			
Globulin			
Glucose (sugar)			Unit
Lactic dehydrogenase (LDH)			Value
Phosphatase, alkaline			
Phosphorus (organic phosphate)	80050	General health screen panel	BR
Potassium	80056	Amenorrhea profile	BR
Protein, total	80057	Male infertility and/or gynecomastia profile	BR
Sodium	80058	Hepatic function panel	BR
Transaminase, glutamic oxaloacetic (SGOT)	80059	Hepatitis panel	BR
Transaminase, glutamic pyruvic (SGPT)	80060	Hypertension panel	BR
Urea nitrogen (BUN)	80061	Lipid profile	BR
Uric acid			

80002	Automated multichannel test; 1 or 2 clinical chemistry test(s)	21.0
80003	3 clinical chemistry tests	28.0
80004	4 clinical chemistry tests	32.0
80005	5 clinical chemistry tests	36.0
80006	6 clinical chemistry tests	40.0
80007	7 clinical chemistry tests	44.0
80008	8 clinical chemistry tests	48.0
80009	9 clinical chemistry tests	52.0
80010	10 clinical chemistry tests	56.0
80011	11 clinical chemistry tests	60.0
80012	12 clinical chemistry tests	64.0
80016	13-16 clinical chemistry tests	66.8
80018	17-18 clinical chemistry tests	69.6
80019	19-24 clinical chemistry tests	72.4
80020	25-30 clinical chemistry tests	75.2
80021	31 or more clinical chemistry tests	78.0

THERAPEUTIC DRUG MONITORING

(e.g., antiepilepsy drugs, cardiac drugs, antibiotics, sedatives)

80031	Therapeutic quantitative drug monitoring in blood and/or urine; measurement one drug (if drug not specified by individual code number)	BR
80032	2 drugs measured	BR
80033	3 drugs measured	BR
80034	4 or more drugs measured	BR
80040	Serum radioimmunoassay for circulating antibiotic levels	BR

ORGAN OR DISEASE ORIENTED PANELS

Organ "panels" as an approach to diagnosis have been developed in response to the increased use of general screening programs that are now in use in physicians' offices, health centers, clinics, and hospitals. Also included here are profiles that combine laboratory tests together under a problem oriented classification. The lack of an expanded list of laboratory tests under each number is deliberate. Because no two laboratories utilize the same array of tests in a particular panel, each laboratory should establish its own profile and accompany each reported panel by a listing of the components of that panel performed by the laboratory.

			Unit
			Value
80050	General health screen panel		BR
80056	Amenorrhea profile		BR
80057	Male infertility and/or gynecomastia profile		BR
80058	Hepatic function panel		BR
80059	Hepatitis panel		BR
80060	Hypertension panel		BR
80061	Lipid profile		BR

Unit Value [Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-330, filed 1/8/87.]

80062	Cardiac evaluation (including coronary risk) panel	BR
80063	Cardiac injury panel	BR
80064	with creatine phosphokinase (CPK) and/or lactic dehydrogenase (LDH) isoenzyme determination	BR
80065	Metabolic panel	BR
80066	Malabsorption panel	BR
80067	Pulmonary (lung function) panel	BR
80068	Lung maturity profile	BR
80070	Thyroid panel	BR
80071	with thyrotropin releasing hormone (TRH)	BR
80072	Arthritis panel	BR
80073	Renal panel	BR
80075	Parathyroid panel	BR
80080	Prostatic panel	BR
80082	Pancreatic panel	BR
80084	Pituitary panel	BR
80085	Microcytic anemia panel	BR
80086	Macrocytic anemia panel	BR
80089	Muscle panel	BR
80090	Antibody panel (e.g., TORCH: Toxoplasma IFA, rubella HI, cytomegalovirus CF, herpes virus CF)	BR
80099	Unlisted panel	BR

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23A-325, filed 7/23/87; 87-03-005 (Order 86-47), § 296-23A-325, filed 1/8/87.]

WAC 296-23A-330 Urinalysis.

(For specific analyses, see appropriate section)

		Unit Value
81000	Urinalysis; routine (pH, specific gravity, protein, tests for reducing substances as glucose), with microscopy	12.0
81002	routine, without microscopy	8.0
81004	components, single, not otherwise listed, specify	5.0
81005	chemical, qualitative, any number of constituents	8.0
(81006 urine volume measurement has been deleted. To report, use 81099)		
81010	concentration and dilution test	14.0
81011	water deprivation test	BR
81012	water deprivation test with vasopressin response	BR
81015	microscopic only	10.0
81020	two or three glass test	10.0
81030	Quantitative sediment analysis and quantitative protein (Addis count)	40.0
81099	Unlisted urinalysis procedure	BR

WAC 296-23A-335 Chemistry and toxicology.

Notes: The material for examination may be from any source. Examination is quantitative unless specified. (For list of automated, multichannel tests, see 80003-80019)

Clinical pathology includes radioimmunoassay as one method of performing many chemistry tests. These codes can be appropriately used by any specialist performing such tests in a laboratory licensed and/or certified for radioimmunoassays. The reporting of these tests is not confined to clinical pathology laboratories alone.

		Unit Value
82000	Acetaldehyde, blood	40.0
82003	Acetaminophen, urine (Acetic anhydride, see volatiles, 84600)	40.0
82005	Acetoacetic acid	40.0
82009	Acetone, qualitative	12.0
82010	quantitative	12.0
(For acetone bodies, see 82009-82010, 82635, 83947)		
82011	Acetylsalicylic acid; quantitative	32.0
82012	qualitative	32.0
82013	Acetylcholinesterase	40.0
(Acid, gastric, see gastric acid, 82926-82932)		
(Acid phosphatase, see 84060-84065)		
82015	Acidity, titratable, urine (ACTH, see 82024)	30.0
(Adrenalin-Noradrenalin, see catecholamines, 82382-82384)		
82024	Adrenocorticotrophic hormone (ACTH), RIA	120.0
82030	Adenosine; 5'-diphosphate (ADP) and 5'-monophosphate (AMP), cyclic, RIA, blood	40.0
82035	5'-triphosphate, blood	40.0
82040	Albumin serum	20.0
82042	urine, quantitative (specify method, e.g., Esbach)	20.0
(For albumin/globulin ratio, albumin/globulin ratio by electrophoretic method, see 84155-84200)		
82055	Alcohol (ethanol), blood; chemical	30.0
82060	by gas-liquid chromatography	40.0
82065	Alcohol (ethanol), urine; chemical	30.0
82070	by gas-liquid chromatography	40.0
82072	Alcohol (ethanol) gelation	30.0
82075	Alcohol (ethanol), breath	60.0
82076	Alcohol; isopropyl	60.0
82078	methyl	60.0
82085	Aldolase, blood; kinetic ultraviolet method	26.0
82086	colorimetric	20.0

	Unit Value		Unit Value
82087 Aldosterone; double isotope technique	120.0	(Antimony, screen, see 83015)	
82088 RIA blood	100.0	(Antitrypsin, alpha-1-, see 86329)	
82089 RIA urine	100.0	82172 Apolipoprotein	BR
82091 saline infusion test	BR	82173 Arginine tolerance test	BR
(Alkaline phosphatase, see 84075-84080)		82175 Arsenic, blood, urine, gastric contents, hair or nails, quantitative	80.0
82095 Alkaloids, tissue; screening	80.0	(For heavy metal screening, see 83015)	
82096 quantitative	120.0	82180 Ascorbic acid (Vitamin C), blood	40.0
82100 Alkaloids, urine, screening	80.0	(Aspirin, see acetylsalicylic acid, 82011, 82012)	
82101 quantitative	120.0	(Atherogenic index, blood, ultracentrifugation, quantitative, see 83717)	
(See also 82486, 82600, 82662, 82755, 84231)		82205 Barbiturates; quantitative	60.0
(Alpha amino acid nitrogen, see 82126)		82210 quantitative and identification	80.0
(Alpha-hydroxybutyric (HBD) dehydrogenase, see 83485, 83486)		(For qualitative screen, see 82486, 82660, 82755, 84231)	
(Alphaketoglutarate, see 83584)		82225 Barium	BR
(Alpha tocopherol (Vitamin E), see 84446)		(Bence-Jones protein, 84185)	
82112 Amikacin	BR	82230 Beryllium, urine	80.0
(Amikacin serum radioimmunoassay, see 80040)		(Beta-glucosidase, see 82963)	
82126 amino acid nitrogen, alpha	50.0	82231 Beta-2 microglobulin, RIA; urine	BR
82128 Amino acids, qualitative	40.0	82232 serum	BR
82130 Amino acids, urine or plasma, chromatographic fractionation and quantitation	180.0	82235 Bicarbonate excretion, urine	BR
82134 Aminohippurate, para (PAH)	30.0	82236 Bicarbonate loading test	BR
82135 Aminolevulinic acid, delta (ALA)	50.0	(Bicarbonate, see 82374)	
82137 Aminophylline	60.0	82240 Bile acids, blood, fractionated	120.0
82138 Amitriptyline	60.0	82245 Bile pigments, urine	8.0
82140 Ammonia; blood	40.0	82250 Bilirubin; blood, total or direct	24.0
82141 urine	40.0	82251 blood, total and direct	30.0
82142 Ammonium chloride loading test	40.0	82252 feces, qualitative	BR
82143 Amniotic fluid scan (spectrophotometric)	50.0	82260 urine, quantitative	12.0
(For L/S ratio, see 83661)		82265 amniotic fluid, quantitative	30.0
(Amobarbital, see 82205-82210)		82268 Bismuth	80.0
82145 Amphetamine or methamphetamine, chemical, quantitative	80.0	82270 Blood; occult, feces, screening	8.0
82150 Amylase, serum	30.0	82273 duodenal, gastric contents, qualitative	BR
82155 isoenzymes electrophoretic	BR	(Blood urea nitrogen (BUN), see 84520-84525, 84545)	
82156 Amylase, urine (diastase)	30.0	(Blood volume, see 84605-84610, 78110, 78111)	
82157 Androstenedione RIA	80.0	82280 Boric acid; blood	100.0
82159 Androsterone	50.0	82285 urine	100.0
82160 RIA	50.0	82286 Bradykinin	BR
(See also 83593-83596)		82290 Bromides; blood	24.0
(Angiotensin I, see renin, 84244)		82291 urine	40.0
82163 Angiotensin II, RIA	BR	82300 Cadmium, urine	100.0
82164 Angiotensin-converting enzyme	BR	82305 Caffeine	60.0
82165 Aniline	BR	82306 Calcifediol (25-OH Vitamin D-3), chromatographic technique	BR
(Antidiuretic hormone, RIA, see 84588)		82307 Calciferol (Vitamin D), RIA	BR
82168 Antihistamines	BR	(For 1, 25-Dihydroxyvitamin D, use 82652)	
82170 Antimony, urine	80.0		

	Unit Value		Unit Value	
82308	Calcitonin, RIA	80.0	82441 Chlorinated hydrocarbons, screen	20.0
82310	Calcium, blood; chemical	22.0	82443 Chlorothiazide-hydrochlorothiazide	60.0
82315	fluorometric	22.0	(Chlorpromazine, see 84021, 84022)	
82320	emission flame photometry	22.0	82465 Cholesterol, serum; total	22.0
82325	atomic absorption flame photometry	24.0	82470 total and esters	30.0
82330	fractionated, diffusible	60.0	82480 Cholinesterase; serum	40.0
82331	after calcium infusion test	24.0	82482 RBC	60.0
82335	Calcium, urine; qualitative (Sulkowitch)	11.0	82484 serum and RBC	80.0
82340	quantitative, timed specimen	32.0	82485 Chondroitin B sulfate, quantitative	BR
82345	Calcium, feces, quantitative, timed specimen	80.0	(Chorionic gonadotropin, see gonadotropin, 82996-83002)	
82355	Calculus (stone), qualitative; chemical	40.0	82486 Chromatography; gas-liquid, compound and method not elsewhere specified	BR
82360	Calculus (stone), quantitative; chemical	60.0	82487 paper, 1-dimensional, compound and method not elsewhere specified	BR
82365	infrared spectroscopy	60.0	82488 paper, 2-dimensional, not elsewhere specified	BR
82370	X-ray diffraction	50.0	82489 thin layer, not elsewhere specified	BR
	(Carbamates, see individual listings)		82490 Chromium; blood	100.0
82372	Carbamazepine, serum	BR	82495 urine	100.0
82374	Carbon dioxide, combining power or content	10.0	82505 Chymotrypsin, duodenal contents	30.0
	(See also 82801-82803, 82817)		82507 Citrate	80.0
82375	Carbon monoxide, (carboxyhemoglobin); quantitative	48.0	82512 Clonazepam	BR
82376	qualitative	48.0	82520 Cocaine, quantitative	60.0
	(Carbon tetrachloride, see 84600)		(Cocaine, screen, see 82486, 82660, 82662, 82755, 84231)	
	(Carboxyhemoglobin, see 82375, 82376)		(Codeine, screen, see 82486, 82660, 82662, 82755, 84231)	
82380	Carotene, blood	40.0	(Codeine, quantitative, see 82096, 82101)	
	(Carotene plus Vitamin A, see 84595)		(Complement, see 86159-86162)	
82382	Catecholamines (dopamine, norepinephrine, epinephrine); total urine	BR	(Compound S, see 82634)	
82383	blood	BR	82525 Copper; blood	60.0
82384	fractionated	BR	82526 urine	60.0
	(For urine metabolites, see 83835, 84585)		(Coprobinogen, feces, 84575)	
82390	Ceruloplasmin, chemical (copper oxidase), blood	40.0	(Coprotoporphyrins, see 84118-84121)	
	(For gel diffusion technique, see 86331; immunodiffusion technique, see 86329)		(Corticosteroids, see 83492-83496)	
82400	Chloral hydrate; blood	60.0	82528 Corticosterone, RIA	BR
82405	urine	40.0	(See also 83593-83597)	
82415	Chloramphenicol; blood	40.0	82529 Cortisol; fluorometric, plasma	36.0
82418	Chlorazepate dipotassium	40.0	82531 CPB, plasma	75.0
82420	Chlordiazepoxide; blood	60.0	82532 CPB, urine	75.0
82425	urine	60.0	82533 RIA, plasma	90.0
82435	Chlorides; blood (specify chemical or electrometric)	20.0	82534 RIA, urine	90.0
82436	urine (specify chemical, electrometric or Fantus test)	20.0	82536 after adrenocorticotrophic hormone (ACTH) administration	BR
82437	sweat (without iontophoresis)	20.0	82537 48 hours after continuous ACTH infusion	BR
82438	spinal fluid	20.0	82538 after metyrapone tartrate administration	BR

	Unit Value		Unit Value
82539	dexamethasone suppression test, plasma and/or urine	BR	
82540	Creatine; blood	24.0	
82545	urine	40.0	
82546	Creatine and creatinine	50.0	
82550	Creatine phosphokinase (CPK), blood; timed kinetic ultraviolet method	26.0	
82552	isoenzymes	30.0	
82555	colorimetric	20.0	
82565	Creatinine; blood	20.0	
82570	urine	20.0	
82575	clearance	40.0	
82585	Cryofibrinogen, blood	40.0	
82595	Cryoglobulin, blood	40.0	
	(Crystals, pyrophosphate vs. urate, see 84208)		
82600	Cyanide; blood	80.0	
82601	tissue	80.0	
82606	Cyanocobalamin (Vitamin B-12); bioassay	70.0	
82607	RIA	45.0	
82608	unsaturated binding capacity	60.0	
	(Cyclic AMP, see 82030)		
	(Cyclic GMP, see 83008)		
82614	Cystine, blood, qualitative	BR	
82615	Cystine and homocystine, urine; qualitative	30.0	
82620	quantitative	40.0	
82624	Cystine aminopeptidase	BR	
	(D hemoglobin, see 83053)		
	(Delta-aminolevulinic acid (ALA), see 82135)		
82626	Dehydroepiandrosterone (DHEA), RIA	BR	
	(See also 83593)		
	(Deoxycortisol, 11-(compound S), RIA, see 82634)		
82628	Desipramine	BR	
82633	Desoxycorticosterone, 11-RIA	BR	
82634	Desoxycortisol, 11-(compound S), RIA	80.0	
	(see also 83492)		
	(Dexamethasone suppression test, see 82539)		
82635	Diacetic acid	18.0	
	(Diastase, urine, see 82156)		
82636	Diazepam	50.0	
82638	Dibucaine number	34.0	
82639	Dicumarol	BR	
	(Dichloroethane, see 84600)		
	(Dichloromethane, see 84600)		
	(Diethylether, see 84600)		
82640	Digitoxin (digitalis); blood, RIA	BR	
82641	urine	BR	
82643	Digoxin, RIA	36.0	
82646	Dihydrocodinone	BR	
	(Dihydrocodinone screen, see 82486-82489, 82662, 82755, 84231)		
82649	Dihydromorphinone, quantitative	75.0	
	(Dihydromorphinone screen, see 82486, 82489, 82662, 82755, 84231)		
82651	Dihydrotestosterone (DHT)	BR	
82652	Dihydroxyvitamin D, 1, 25-	BR	
82654	Dimethadione	BR	
	(Diphenylhydantoin, see 84045)		
	(Dopamine, see 82382-82384)		
82656	Doxepin	BR	
82660	Drug screen (amphetamines, barbiturates, alkaloids)	65.0	
	(See also 82486-82489, 82662, 82755, 84231)		
	(Duodenal contents, see individual enzymes; for intubation and collection, see 89100)		
	(Endocrine receptor assays, see 84233-84235)		
82662	Enzyme immunoassay technique for drugs, EMIT	30.0	
	(For enzyme immunoassay for bacteria, use 86227)		
82664	Electrophoretic technique, not elsewhere specified	45.0	
82666	Epiandrosterone	BR	
	(See also 83593, 83596)		
	(Epinephrine, see 82382-82384)		
82668	Erythropoietin, bioassay	BR	
	(For HI method, see 86280)		
82670	Estradiol, RIA (placental)	90.0	
82671	Estrogens; fractionated	85.0	
82672	total	60.0	
82673	Estriol; fluorometric	54.0	
82674	GLC	45.0	
82676	Chemical	75.0	
82677	RIA	105.0	
	(Estrogen receptor assay, see 84233)		
82678	Estrone; chemical	75.0	
82679	RIA	90.0	
	(Ethanol, see 82055-82075)		
82690	Ethchlorvynol; blood	60.0	
82691	urine	60.0	
82692	Ethosuximide	BR	
	(Ethyl alcohol, see 82055-82075)		
82694	Etiocolanolone	BR	

	Unit Value		Unit Value
(See also 83593, 83596)		(Gamma-glutamyl transpeptidase (GGT), see 82977)	
(Evans Blue, see blood volume, 84605-84610)		82790 Gases, blood, oxygen saturation; by calculation from pO ₂	40.0
82696 Etiocholanolone, RIA	50.0	82791 by manometry	40.0
82705 Fat or lipids, feces; screening	10.0	82792 by oximetry	20.0
82710 quantitative, 24 or 72 hour specimen	100.0	82793 by spectrophotometry	40.0
82715 Fat differential, feces, quantitative . .	BR	82795 by calculation from pCO ₂	6.0
82720 Fatty acids, blood; esterified	40.0	82800 Gases, blood; pH, only	20.0
82725 nonesterified	40.0	82801 pCO ₂	24.0
82727 Ferric chloride, urine	BR	82802 pH, pCO ₂ by electrode	42.0
82728 Ferritin, specify method (e.g., RIA, immunoradiometric assay)	BR	82803 pH, pCO ₂ , pO ₂ simultaneous	54.0
(Fetal hemoglobin, see hemoglobin 83020, 83033, and 85460)		82804 pO ₂ by electrode	40.0
(Fetoprotein, alpha-1, see 86329)		82812 pO ₂ by manometry	24.0
82730 Fibrinogen, quantitative	21.0	82817 pH, pCO ₂ by tonometry	24.0
(See also 85371, 85377)		82926 Gastric acid, free and total; single specimen	11.2
82735 Fluoride; blood	100.0	82927 each additional specimen	9.0
82740 urine	100.0	82928 Gastric acid, free or total; single specimen	9.0
82741 Flucytosine (5-fluorocytosine)	BR	82929 each additional specimen	7.5
82742 Flurazepam	BR	82931 Gastric acid, pH titration; single specimen	24.0
82745 Folic acid (folate), blood; bioassay . .	BR	82932 each additional specimen	18.0
82746 RIA	45.0	(82939 has been deleted. If necessary to report use 84999)	
(Follicle stimulating hormones (FSH), see 83000, 83001)		(Gastric analysis, with stimulation, see 89140, 89141, 91052)	
82750 Formiminoglutamic acid (FIGLU), urine	100.0	(Gastric analysis, pepsin, see 83974)	
82755 Free radical assay technique for drugs (FRAT)	BR	(For gastric intubation, see 89130, 74340)	
82756 Free thyroxine index (T-7)	BR	82938 Gastrin (serum) after secretin stimulation (e.g., for gastrinoma, Zollinger-Ellison syndrome)	BR
82757 Fructose, semen	BR	82941 Gastrin, RIA	48.0
(Fructose, TLC screen, see 84375)		(Gentamicin, see 84695)	
(Furosemide test, see 84246)		(GGT, see 82977)	
82759 Galactokinase, RBC	BR	(Gentamicin serum radioimmunoassay, see 80040)	
82760 Galactose; blood	40.0	(GLC, gas liquid chromatography, see 82486)	
82763 tolerance test	75.0	82942 Globulin, serum	10.5
82765 urine	40.0	(See also 82784, 82786, 84155-84200, 86329)	
(For TLC screen, see 84375)		82943 Glucagon, RIA	BR
82775 Galactose-1-phosphate uridyl transferase; quantitative	60.0	82944 Glucosamine	6.0
82776 screen	18.0	82946 Glucagon tolerance test	BR
82780 Gallium	BR	82947 Glucose; except urine (e.g., blood, spinal fluid, joint fluid)	10.5
82784 Gammaglobulin, A, D, G, M nephelometric, each	12.0	82948 blood, stick test	8.2
82785 Gammaglobulin, E, (e.g., RIA, EIA)	75.0	82949 fermentation	22.5
82786 Gammaglobulin, salt precipitation method	21.0	82950 post glucose dose (includes glucose)	13.5
(Gammaglobulin by gel (immuno) diffusion, see 86329)		82951 tolerance test (GTT), three specimens (includes glucose)	37.5

	Unit Value		Unit Value
82952		tolerance test, each additional be- yond three specimens	10.5
		(For intravenous glucose tolerance test, see 82961)	
82953		tolbutamide tolerance test	15.0
		(For insulin tolerance test, see 82937)	
		(For leucine tolerance test, see 83681)	
82954		Glucose, urine	20.0
82955		Glucose-6-phosphate dehydrogenase(G6PD); quantitative	60.0
82960		screen	56.0
82961		Glucose tolerance test, intravenous . .	BR
82963		Glucosidase, beta	BR
82965		Glutamate dehydrogenase, blood . . .	40.0
		(Glutamic oxaloacetic transaminase (SGOT), see 84450-84455)	
		(Glutamic pyruvic transaminase (SGPT), see 84460-84465)	
82975		Glutamine (glutamic acid amide), spinal fluid	80.0
82977		Glutamyl transpeptidase, gamma (GGT)	BR
82978		Glutathione	BR
82979		Glutathione reductase, RBC	BR
82980		Glutethimide	56.2
		(Glycohemoglobin, see 83036)	
82985		Glycoprotein, electrophoresis	60.0
82995		Gold, blood	100.0
		(82996-82998, Gonadotropin, chorionic, have been deleted, see 84702-84703)	
83000		Gonadotropin, pituitary, follicle stimulating hormone (FSH); bioas- say	90.0
83001		RIA	90.0
83002		Gonadotropin, pituitary, luteinizing hormone (LH)(ICSH), RIA	90.0
		(For luteinizing releasing factor (LRH), see 83727)	
83003		Growth hormone human (HGH), (somatotropin); RIA	48.0
83004		after glucose tolerance test	48.0
		(For growth hormone secretion after arginine toler- ance test, see 82173)	
		(For human growth hormone antibody, RIA, see 86277)	
83005		Guanase, blood	40.0
83008		Guanosine monophosphate (GMP), cyclic, RIA	BR
83010		Haptoglobin; chemical	60.0
83011		quantitative, electrophoresis	30.0
83012		phenotypes, electrophoresis	60.0
83015		Heavy metal screen (arsenic, bis- muth, mercury, antimony); chemical (e.g., Reinsch, Gutzeit)	30.0
83018		chromatography, DEAE column	BR
83020		Hemoglobin; electrophoresis (in- cludes A ₂ , S, C, etc.)	80.0
		(Hemoglobin, carboxyhemoglobin (CO), see 82375, 82376; colorimetric, see 85018, 85031)	
83030		F (fetal), chemical	40.0
83033		F (fetal), qualitative (APT) test, fecal	56.0
83036		glycosylated (Alc)	60.0
83040		methemoglobin, electrophoretic separation	80.0
83045		methemoglobin, qualitative	20.0
83050		methemoglobin, quantitative	40.0
83051		plasma	40.0
83052		sickle, turbidimetric	34.0
83053		solubility, S-D, etc.	40.0
83055		sulfhemoglobin, qualitative	20.0
83060		sulfhemoglobin, quantitative	40.0
83065		thermolabile	BR
83068		unstable, screen	BR
83069		urine	BR
83070		Hemosiderin, urine	12.0
83071		Hemosiderin, RIA	25.6
		(Heroin, screening, see 82660, 82486, 82662, 82755, 84231; quantitative, see 82096, 82101)	
		(HIAA, see 83497)	
83086		Histidine; blood, qualitative	BR
83087		urine, qualitative	BR
83088		Histamine	100.0
		(Homocystine, qualitative, see 82615)	
		(Homocystine, quantitative, see 82620)	
83093		Homogentisic acid; blood, qualita- tive	BR
83094		urine, qualitative	20.0
83095		urine, quantitative	40.0
83150		Homovanillic acid (HVA), urine . . .	80.0
		(Hormones, see individual alphabetic listings in chemistry section)	
83485		Hydroxybutyric dehydrogenase, al- pha (HBD), blood; kinetic ultraviolet method	22.0
83486		colorimetric method	20.0
83491		Hydroxycorticosteroids, 17-(17- OHCS); RIA	64.1
83492		gas liquid chromatography (GLC)	82.0
83493		blood, Porter-Silber type	45.0
83494		blood, fluorometric	38.0
83495		urine, Porter-Silber type	52.0
83496		urine, fluorometric	52.0

	Unit Value		Unit Value
(See also 82531-82534, 82634, 84409)		(83596 D/A/E ratio has been deleted)	
83497 Hydroxyindolacetic acid, 5-(HIAA), urine	60.0	83597 11-desoxy: 11-oxy ratio	75.0
(For HIAA, blood, see 84260)		(See also 82528, 82632, 82633, 82666, 82694)	
83498 Hydroxyprogesterone, 17-d, RIA ...	105.0	83599 Ketosteroids, 17-OH, RIA	64.1
83499 Hydroxyprogesterone, 20-.....	BR	83600 Kynurenic acid	90.0
83500 Hydroxyproline, urine; free only	100.0	83605 Lactate, (lactic acid)	40.0
83505 total only	100.0	83610 Lactic dehydrogenase (LDH), RIA ..	33.7
83510 free and total	180.0	83615 Lactic dehydrogenase (LDH), blood; kinetic ultraviolet method	26.0
83523 Imipramine	67.0	83620 colorimetric or fluorometric	20.0
(Immunoglobulins, see 82784, 82785, 82786, 86329, 86335)		83624 heat or urea inhibition (total not included)	24.0
83524 Indican, urine	35.0	83625 isoenzymes, electrophoretic sepa- ration and quantitation	60.0
83525 Insulin, RIA	40.0	83626 isoenzymes, chemical separation ..	20.0
(For proinsulin, see 84206)		83628 Lactic dehydrogenase, liver (LLDH)	20.0
83526 Insulin tolerance test	80.0	83629 Lactic dehydrogenase (LDH), urine ..	20.0
83528 Intrinsic factor level	BR	83631 Lactic dehydrogenase (LDH), CSF ..	20.0
(For intrinsic factor antibodies, RIA, see 86340)		(For hydroxybutyric dehydrogenase (HBD), see 83485)	
83530 Inulin clearance	40.0	83632 Lactogen, human placental (HPL) chorionic somatomammotropin, RIA	30.0
(83533, 83534 Protein bound iodine have been de- leted. To report, use 84999)		83633 Lactose, urine; qualitative	20.0
(For thyroxine, see 84435-84439)		83634 quantitative	20.0
(For triiodothyronine (true T-3), RIA, see 84480)		(For tolerance, see 82951-82952)	
83540 Iron, serum; chemical	20.0	(For TLC screen, see 84375)	
83545 automated	12.0	83645 Lead, screening; blood	20.0
83546 radioactive uptake method	30.0	83650 urine	20.0
83550 Iron binding capacity, serum; chemi- cal	20.0	83655 Lead, quantitative; blood	60.0
83555 automated	12.0	83660 urine	60.0
83565 radioactive uptake method	30.0	83661 Lecithin - sphingomyelin (L/S ra- tio), amniotic fluid	75.0
83570 Isocitric dehydrogenase (IDH), blood; kinetic ultraviolet	26.0	83670 Leucine aminopeptidase (LAP), blood; kinetic ultraviolet method ...	26.0
83571 colorimetric	20.0	83675 colorimetric	20.0
(Isopropyl alcohol, see alcohol 82076)		83680 Leucine aminopeptidase (LAP), urine	26.0
83576 Isonicotinic acid hydrazide (INH) ..	105.0	83681 Leucine tolerance test	26.0
83578 Kanamycin	49.0	83685 Lidocaine	20.0
83582 Ketogenic steroids, urine; 17-(17- KGS)	45.0	83690 Lipase, blood	30.0
83583 11-desoxy: 11-oxy ratio	75.0	83700 Lipids, blood; total	30.0
83584 Ketoglutarate, alpha	40.0	83705 fractionated (cholesterol, triglycer- ides, phospholipids)	60.0
(Ketone bodies, see 82005-82010; urine, see 81000-81005)		(For feces, see 82705-82715)	
83586 Ketosteroids 17-(17-KS), blood; to- tal	38.0	83715 Lipoprotein, blood; electrophoretic separation and quantitation (phenotyping)	60.0
83587 fractionation, alpha/beta	75.0	83717 analytic ultracentrifugation sepa- ration and quantitation (athero- genic index)	100.0
83588 RIA	54.0	83718	
83589 Ketosteroids, 17-(17-KS), urine; to- tal	36.0		
83590 fractionation, alpha/beta	60.0		
83593 chromatographic fractionation ...	75.0		

	Unit Value		Unit Value
Lipoprotein high density cholesterol (HDL cholesterol) by precipitation method)	BR	83859 Methypylon	90.0
83719 Lipoprotein very low density cholesterol (VLDL cholesterol) by ultracentrifugation	BR	(Microglobulin, beta-2, RIA, see 82231, 82232)	
83720 Lipoprotein cholesterol fractionation calculation by formula	BR	83860 Morphine, screening	80.0
83725 Lithium, blood, quantitative	60.0	83861 quantitative	120.0
(Luteinizing hormone (LH), see 83002)		83862 RIA	82.0
83727 Luteinizing releasing factor (LRH), RIA	60.0	83864 Mucopolysaccharides, acid, blood . . .	60.0
83728 Lysergic acid diethylamide (LSD), RIA	BR	83865 Mucopolysaccharides, acid, urine; quantitative	60.0
83730 (Macroglobulins (Sia) test)	30.0	83866 screen	21.0
(Macroglobulins, alpha-2-Sia, see 86329)		(83870 Mucoprotein, blood has been deleted. To report use 84999)	
83735 Magnesium, blood; chemical	20.0	83872 Mucin, synovial fluid (Ropes test) . .	21.0
83740 fluorometric	20.0	83873 Myeline basic protein, CSF, RIA . . .	BR
83750 atomic absorption	40.0	(For oligoclonal bands, see 83916)	
83755 Magnesium, urine, chemical	40.0	83874 Myoglobin, electrophoresis	30.0
83760 fluorometric	40.0	83875 Myoglobin, urine	40.0
83765 atomic absorption	40.0	83880 Nalorphine	60.0
83775 Malate dehydrogenase, kinetic ultraviolet method	30.0	83885 Nickel, urine	100.0
(Maltose tolerance, see 82951, 82952)		83887 Nicotine	75.0
(Mammotropin, see 84146)		83895 Nitrogen, total; urine, 24-hour specimen	60.0
83785 Manganese, blood or urine	60.0	83900 feces, 24-hour specimen	100.0
83790 Mannitol clearance	BR	83910 Nonprotein nitrogen (NPN), blood . .	20.0
(Marijuana, see tetrahydrocannabinol THC, 84408)		(Norepinephrine, see 82382-82384)	
83795 Melanin, urine, qualitative	60.0	83915 Nucleotidase 5'-	25.0
83799 Meperidine, quantitative	54.0	83916 Oligoclonal immune globulin (Ig), CSF, by electrophoresis	BR
(For screen, see 82486, 82489, 82662, 82755, 84231)		(For myelin basic protein, CSF, see 83873)	
83805 Meprobamate, blood or urine	60.0	83917 Organic acids; screen, qualitative . . .	30.0
(For screen, see 82486, 82489, 84231)		83918 quantitative	30.0
83825 Mercury, quantitative; blood	70.0	83920 Ornithine carbamyl transferase (OCT)	24.0
83830 urine	70.0	83930 Osmolality; blood	20.0
(Mercury screen, see 83015)		83935 urine	20.0
83835 Metanephrines, urine	52.0	83938 Ouabain	BR
(For catecholamines, see 82382-82384)		83945 Oxalate, urine	40.0
83840 Methadone	60.0	(For alpha-oxoglutarate, see 83584)	
(Methamphetamine, see 82145)		83946 Oxazepam	40.0
(Methanol, see 82078)		83947 Oxybutyric acid, beta	40.0
83842 Methapyrilene	50.0	83948 Oxycodinone	52.0
83845 Methaqualone	90.0	(Oxygen, see gases, blood, 82790-82817)	
83857 Methemalbumin	32.0	83949 Oxytocinase, RIA	52.0
(Methemoglobin, see hemoglobin 83045-83050)		(Para-aminohippuric acid, see 82134)	
83858 Methsuximide, serum	90.0	83965 Paraldehyde, blood, quantitative	60.0
(Methyl alcohol, see 82078)		83970 Parathormone (parathyroid hormone), RIA	165.0
		(PBI, see 83533)	
		83971 Penicillin, urine	50.0
		83972 Pentazocine	60.0

	Unit Value		Unit Value
83973 Pentose, urine, qualitative	13.5	(See also 83705)	
(For TLC screen, see 84375)		(For lecithin/sphingomyelin ratio, see 83661)	
83974 Pepsin, gastric	23.0	84100 Phosphorus (phosphate); blood	24.0
83975 Pepsinogen, blood	40.0	84105 urine	24.0
83985 Pesticide other than chlorinated hydrocarbons, blood, urine, or other material	BR	(Pituitary gonadotropins, see 83000-83002)	
(Pesticide, chlorinated hydrocarbons, see 82441)		(PKU, see 81005, 84030, 84031)	
83986 pH, body fluid, except blood	BR	84106 Porphobilinogen, urine; qualitative	20.0
(For blood, see 82800, 82802, 82803, 82817)		84110 quantitative	20.0
83992 Phencyclidine (PCP)	38.0	84118 Porphyrins, copro-, urine; quantitative	30.0
(Phenobarbital, see barbiturates 82205-82210)		84119 qualitative	24.0
83995 Phenol, blood or urine	60.0	84120 Porphyrins; copro- and uro-, fractionated, urine	64.0
84005 Phenolsulphonphthalein (PSP), test, urine	20.0	84121 uro-, copro-, and porphobilinogen, urine	80.0
84021 Phenothiazine, urine; qualitative, chemical	100.0	84126 Porphyrins, feces, quantitative	100.0
(See also 82486 et seq.)		84128 Porphyrins, plasma	82.0
84022 quantitative, chemical	BR	(Porphyrin precursors, see 82135)	
(See also individual drugs)		(For protoporphyrin, RBC, see 84202, 84203)	
84030 Phenylalanine (PKU), blood; Guthrie	12.0	84132 Potassium; blood	24.0
(Phenylalanine-tyrosine ratio, see 84030, 84510)		84133 urine	24.0
84031 fluorometric	12.0	84135 Pregnanediol; RIA	BR
84033 Phenylbutazone	20.0	84136 other method (specify)	BR
84035 Phenylketones; blood, qualitative	20.0	84138 Pregnanetriol; RIA	BR
84037 urine, qualitative	20.0	84139 other method (specify)	BR
84038 Phenylpropanolamine	20.0	84141 Primidone	60.0
84039 Phenylpyruvic acid; blood	20.0	84142 Procaïnamide	60.0
84040 urine	20.0	84144 Progesterone, any method	105.0
(For qualitative chemical tests, urine, see 81005)		(Progesterone receptor assay, see 84234)	
84045 Phenytoin	61.0	(For proinsulin, RIA, see 84206)	
84060 Phosphatase, acid; blood	24.0	84146 Prolactin (mammotropin), RIA	225.0
84065 prostatic fraction	40.0	84147 Propoxyphene	60.0
84066 prostatic fraction, RIA	60.0	(For screen, see 82486 et seq.)	
84075 Phosphatase, alkaline, blood	24.0	84149 Propranolol	BR
84078 heat stable (total not included)	16.0	84150 Prostaglandin, any one, RIA	BR
84080 isoenzymes, electrophoretic method	BR	84155 Protein, total, serum; chemical	20.0
84081 Phosphatidylglycerol	BR	84160 refractometric	12.0
84082 Phosphates, tubular reabsorption of (TRP)	60.0	84165 electrophoretic fractionation and quantitation	60.0
(Phosphates, inorganic, see 84100-84105)		84170 Protein, total and albumin/globulin ratio	40.0
(Phosphates, organic, see 82480-82484)		(For serum albumin, see 82040; serum globulin, see 82942)	
84083 Phosphoglucomutase, isoenzymes	60.0	84175 Protein, other sources, quantitative	24.0
84085 Phosphogluconate, 6-, dehydrogenase, RBC	18.0	84176 Protein, special studies (e.g., monoclonal protein analysis)	BR
84087 Phosphohexose isomerase	30.0	84180 Protein, urine; quantitative, 24-hour specimen	24.0
84090 Phospholipids, blood	30.0	84185 Bence-Jones	12.0
		84190 electrophoretic fractionation and quantitation	80.0

	Unit Value		Unit Value
84195 Protein, spinal fluid; semi-quantitative (Pandy)	20.0	84315 Specific gravity (except urine)	8.0
84200 electrophoretic fractionation and quantitation	80.0	(For urine specific gravity, see 81000)	
84201 Protirelin, thyrotropin releasing hormone (TRH) test	BR	84317 Starch, feces, screening	8.0
84202 Protoporphyrin, RBC; quantitative ..	30.0	84318 Stercobilin, qualitative, feces	BR
84203 screen	20.0	(Stone analysis, see 82355-82370)	
84205 Protiptylene	68.0	84324 Strychnine	75.0
84206 Proinsulin, RIA	60.0	(Sugar, see under glucose)	
84207 Pyridoxine (Vitamin B-6)	BR	84375 Sugars, chromatographic, TLC or paper chromatography	80.0
84208 Pyrophosphate vs. urate, crystals (polarization)	12.0	(Sulfhemoglobin, see hemoglobin, 83055-83060)	
84210 Pyruvate, blood	30.0	(84382 has been deleted)	
84220 Pyruvic kinase, RBC	30.0	84395 Sulfonamide, blood, chemical	20.0
84228 Quinine	30.0	(84397 has been deleted)	
84230 Quinidine, blood	40.0	(T-3, see 84435, 84479, 84480)	
84231 Radioimmunoassay (RIA) not elsewhere specified	BR	(T-4, see 84435-84439)	
(Reinsch test, see 83015)		(84401 has been deleted)	
84232 Releasing factor	BR	84403 Testosterone, blood, RIA	105.0
84233 Receptor assay; estrogen (estradiol) ..	BR	(84404 has been deleted)	
84234 progesterone	BR	84405 Testosterone, urine, RIA	120.0
84235 endocrine, other than estrogen or progesterone (specify hormone) ..	BR	84406 Testosterone, binding protein	BR
84236 progesterone and estrogen	BR	84407 Tetracaine	BR
84238 nonendocrine (e.g., acetylcholine) (specify receptor)	BR	84408 Tetrahydrocannabinol THC (marijuana)	BR
84244 Renin (angiotensin I); (RIA)	60.0	84409 Tetrahydrocortisone or tetrahydrocortisol	105.0
(See also 82163, angiotensin II)		(See also 83491-83497)	
84246 furosemide test	BR	84410 Thallium, blood or urine	100.0
(Renin converting enzyme, see 82164)		84420 Theophylline, blood or saliva	60.0
(84250, 84251 resine uptake have been deleted. To report, use 84479, 84435)		84425 Thiamine (Vitamin B-1)	BR
84252 Riboflavin (Vitamin B-2)	BR	84430 Thiocyanate, blood	30.0
(Salicylates, see 82011, 82012)		84434 Thioridazine	40.0
(Saline infusion test, see 82091)		(Thyrotropin releasing hormone (TRH) test, see 84201)	
(Secretin test, see 89100 and appropriate analyses)		84435 Thyroxine, (T-4), CPB or resin uptake	33.0
84255 Selenium, blood, urine or tissue	100.0	84436 Thyroxine, true (TT-4), RIA	21.0
84260 Serotonin, blood	120.0	84437 Thyroxine (T-4), neonatal	20.0
(For urine metabolites, see 83497)		84439 Thyroxine, free (FT-4), RIA (unbound T-4 only)	45.0
84275 Sialic acid, blood	50.0	(84441 Thyroxine (T-4) method has been deleted. To report, use 84435-84439)	
(Sickle hemoglobin, see 83020, 83052, 83053, 85660)		84442 Thyroxine binding globulin (TBG) ..	52.0
84285 Silica, blood, urine or tissue	100.0	(Thyroxine, free thyroxine index, T-7, see 82756)	
84295 Sodium; blood	24.0	(Thyroid hormones, PBI, thyroxine, etc., see 84480, 84250)	
84300 urine	24.0	84443 Thyroid stimulating hormone (TSH), RIA	60.0
(Somatomammotropin, see 83632)			
(Somatotropin, see 83003; chorionic, see 83632)			
84310 Sorbitol dehydrogenase, serum	26.0		

	Unit Value		Unit Value
(Thyroid stimulating hormone (TSH), neonatal, see 84800)		84570 quantitative, timed specimen	24.0
84444 Thyrotropin releasing factor (TRF), RIA	BR	84575 Urobilin, feces, quantitative	60.0
84445 plus long acting (LATS)	BR	84577 Urobilinogen, feces, quantitative	30.0
(Tobramycin, see 84840)		84578 Urobilinogen, urine; qualitative	24.0
84446 Tocopherol alpha (Vitamin E)	38.0	84580 quantitative, timed specimen	24.0
(Tolbutamide tolerance, see 82951-82952)		84583 semiquantitative	20.0
84447 Toxicology, screen; general	BR	84584 Uropepsin, urine	24.0
84448 sedative (acid and neutral drugs, volatiles)	45.0	(Uroporphyrins, see 84120, 84121)	
84450 Transaminase, glutamic oxaloacetic (SGOT), blood; timed kinetic ultra- violet method	24.0	(Valproic acid, see 80031)	
84455 colorimetric or fluorometric	20.0	84585 Vanillylmandelic acid (VMA), urine	24.0
84460 Transaminase, glutamic pyruvic (SGPT), blood; timed kinetic ultra- violet method	24.0	84588 Vasopressin (antidiuretic hormone), RIA	BR
84465 colorimetric or fluorometric	20.0	84589 Viscosity, fluid	10.0
(Transferrin, see 86329)		84590 Vitamin A, blood	40.0
84472 Trichloroethanol	60.0	84595 including carotene	60.0
84474 Trichloroacetic acid	36.0	(See also 82380)	
(Trichloroacetaldehyde, see 82400-82405)		(Vitamin B-1, see 84425)	
84476 Trifluoperazine	36.0	(Vitamin B-2, see 84252)	
84478 Triglycerides, blood	30.0	(Vitamin B-6, see 84207)	
(See also 83705)		(Vitamin B-12, blood, see 82606, 82607)	
84479 Triiodothyronine (T-3), resin up- take	BR	(Vitamin B-12, absorption (Schilling), see 78270, 78271)	
84480 Triiodothyronine true (TT-3), RIA	36.0	(Vitamin C, see 82180)	
84481 Triiodothyronine, free (FT-3), RIA (unbound T-3 only)	BR	(Vitamin D, see 82306, 82307)	
84483 Trimethadione	36.0	(Vitamin E, see 84446)	
84485 Trypsin, duodenal fluid	30.0	84597 Vitamin K	BR
84488 Trypsin, feces; qualitative, 24-hour specimen	30.0	(VMA, see 84585)	
84490 quantitative	30.0	84600 Volatiles (acetic anhydride, carbon tetrachloride, dichloroethane, dich- loromethane, diethylether)	45.0
(Tubular reabsorption of phosphate, blood and urine, see 84082)		(For acetaldehyde, see 82000)	
84510 Tyrosine, blood	40.0	84605 Volume, blood, dye method (Evans blue)	30.0
(Ultracentrifugation, lipoprotein, see 83717)		84610 including total plasma and total blood cell volume	50.0
(Urate vs. pyrophosphate crystals, see 84208)		(Volume, blood, RISA or Cr-51, see 78110, 78111)	
84520 Urea nitrogen, blood (BUN); quanti- tative	22.0	84613 Warfarin	BR
84525 stick test	8.0	84615 Xanthurenic acid	BR
84540 Urea nitrogen urine	20.0	84620 Xylose tolerance test, blood	40.0
84545 Urea nitrogen clearance	40.0	84630 Zinc, quantitative; blood	100.0
84550 Uric acid; blood, chemical	20.0	84635 urine	100.0
84555 uricase, ultraviolet method	26.0	84645 Zinc sulphate turbidity	20.0
84560 Uric acid, urine	20.0	(84680 has been deleted. To report use 82677)	
84565 Urobilin, urine; qualitative	12.0	84681 C-peptide, any method	BR
		84695 Gentamicin	38.5
		84702 Gonadotropin, chorionic; quantita- tive	30.0
		84703 qualitative	30.0

	Unit Value		Unit Value
84800 Thyroid stimulating hormone (TSH), neonatal	60.0	85022 WBC, Hgb, Hct and indices only . hemogram, automated, and manual differential WBC count (CBC) ...	10.5 15.0
84810 Tobramycin	BR	85023 hemogram and platelet count, auto- mated, and manual differential WBC count (CBC)	17.0
84999 Unlisted chemistry or toxicology pro- cedure	BR	85024 hemogram and platelet count, auto- mated, and automated partial dif- ferential WBC (CBC)	17.0
<p>Note: Gas-liquid chromatography, paper chromatography, electrophoresis, nuclear medicine, enzyme immunoassay and radioimmunoassay techniques are being extended constantly for the analysis of many drugs, hormones and other substances. Where these methodologies are not specifically listed under the compound in question, such tests should be coded under the listing for the specific general methodology. (For immunodiffusion, immunoprecipitin, and counter-immunoelectrophoretic methods other than enzyme and radioimmunoassay techniques, see immunology section.)</p>		85025 hemogram and platelet count, auto- mated, and automated complete differential WBC (CBC)	17.0
<p>[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23A-335, filed 7/23/87; 87-03-005 (Order 86-47), § 296-23A-335, filed 1/8/87.]</p>		85027 hemogram, automated, with platelet count	12.0
<p>WAC 296-23A-340 Hematology. (Includes blood clotting (coagulation) procedures. For blood banking procedures, see under Immunology) (Agglutinins, see Immunology) (Antifactor (specific coagulation factors), see 85300-85341) (Antiplasmin, see 85410) (Antiprothrombinase, see 85311) (Antithrombin III, see 85300) (Basophil count, see 85005)</p>		(85028 has been deleted. To report, see 85023-85025)	
	Unit Value	85029 Additional automated hemogram indi- ces (e.g., red cell distribution width (RDW), mean platelet volume (MPV), red blood cell histogram, platelet histogram, white blood cell histogram, three part differential); one to three indices	BR BR
85000 Bleeding time; Duke	10.0	85030 four or more indices	BR
85002 Ivy or template	24.0	85031 Blood count; hemogram, manual, complete CBC (RBC, WBC, Hgb, Hct, differential and indices)	16.5
(85003 Adelson-Crosby immersion method has been deleted. To report, use 85999)		85041 red blood cell count (RBC) only...	8.0
(Blood cell morphology only, see 85548)		(See also 85021-85031, 89050)	
85005 Blood count; basophil count, direct ...	10.0	85044 reticulocyte count	12.0
85007 differential WBC count (includes RBC morphology and platelet esti- mation)	7.5	85048 white blood cell (WBC)	8.0
(See also 85548, 85585)		(See also 85021-85031)	
(For other fluids, e.g., CSF, see 89051, 89190)		85095 Bone marrow smear and/or cell block; aspiration only	45.0
85009 differential WBC count, buffy coat	12.0	(85096 has been deleted. For interpretation of smear, use 85097; for cell block interpretation, see 88304, 88305)	
85012 eosinophil count, direct	10.0	85100 aspiration, staining and interpreta- tion	140.0
(For nasal smear, see 89180)		85101 aspiration and staining only	75.0
85014 hematocrit	8.0	(For special stains, see 85535, 85540, 85560, 88312-88313)	
85018 hemoglobin, colorimetric	8.0	85102 Bone marrow needle biopsy	75.0
(For other hemoglobin determination, see 83020- 83068)		85103 staining and interpretation	60.0
85021 hemogram, automated (RBC,		85109 staining and preparation only	30.0
		85150 Calcium clotting time	40.0
		85160 Calcium saturation clotting test	40.0
		85165 Capillary fragility test, Rumpel-Leede separate procedure	20.0
		85170 Clot retraction; screen	8.0
		85171 quantitative	45.0
		85172 inhibition by drugs	BR
		85175 Clot lysis time, whole blood dilution .	40.0

	Unit Value		Unit Value
(Clotting factor I (fibrinogen), see 82730, 85371-85377)		85364	hemagglutination inhibition (Merskey), microtiter 36.0
85210 Clotting factor II prothrombin, specific 40.0		85365	immunoelectrophoresis BR
(See also 85610-85618)		85367	precipitation 18.0
85220 factor V (AcG or proaccelerin) labile factor 40.0		85368	protamine paracoagulation (PPP) BR
85230 factor VII (proconvertin, stable factor) 40.0		85369	staphylococcal clumping 12.0
85240 factor VIII (AHG), one stage 40.0			(Fibrinogen, quantitative, see 82730)
85242 factor VIII (AHG), two stage 40.0		85371	Fibrinogen, semiquantitative; latex 40.0
85244 factor VIII related antigen quantitation BR		85372	turbidimetric 22.5
85250 factor IX (PTC or Christmas) 40.0		85376	Fibrinogen; thrombin with plasma dilution 24.0
85260 factor X (Stuart-Prower) 40.0		85377	thrombin time dilution 36.0
85270 factor XI (PTA) 40.0		85390	Fibrinolysins; screening 20.0
85280 factor XII (Hageman) 40.0		85392	with EACA control BR
85290 factor XIII (fibrin stabilizing) 40.0		85395	semiquantitative 30.0
85291 factor XIII (fibrin stabilizing), screen solubility 40.0			(85396 has been deleted, use 85999)
85292 preallikrein assay (Fletcher factor assay) BR		85398	Fibrinolysis, quantitative 45.0
85293 high molecular weight kinninogen assay (Fitzgerald factor assay) BR		85400	Fibrinolytic mechanisms; plasmin BR
85300 Clotting inhibitors or anticoagulants; antithrombin III, except antigen assay 40.0		85410	antiplasmin BR
85301 antithrombin III, antigen assay BR		85420	plasminogen, except antigenic assay BR
85302 protein C assay BR			(For plasminogen activator, see 85665)
85310 antithromboplastin 40.0		85421	plasminogen, antigenic assay BR
85311 antiprothrombinase 40.0		85426	von Willebrand factor assay BR
85320 antiprothromboplastin 40.0			(Fragility, red blood cell, see 85547, 85555-85557)
85330 antifactor VIII 40.0		85441	Heinz bodies; direct 9.0
85340 cross recalcification time (mixtures) 40.0		85445	induced, acetyl phenylhydrazine 19.5
85341 PTT inhibition test BR			(Hematocrit (PCV), see 85014, 85021-85031)
85345 Coagulation time; Lee and White 30.0			(Hemoglobin, see 83020-83068, 85018-85031)
85347 activated 20.0		85460	Hemoglobin, fetal, differential lysis (Kleihauer) 26.0
85348 other methods BR			(See also 83030, 83033)
(Complete blood count, see 85021-85031)			(Hemogram, see 85021-85031)
(Differential count, see 85007 et seq.)			(Hemolysins, see 86006, 86281, 86282)
(Drug inhibition, clot retraction, see 85172)		85520	Heparin assay 60.0
(Duke bleeding time, see 85000)		85530	Heparin-protamine tolerance test 60.0
(Eosinophil count, direct, see 85012)		85535	Iron stain (RBC or bone marrow smears) 18.0
(Eosinophils, microscopic examination for, in various body fluids, see 89180)			(Ivy bleeding time, see 85002)
(Ethanol gel, see 85363)		85538	Leder stain (esterase) blood or bone marrow 30.0
85360 Euglobulin lysis 40.0		85540	Leucocyte alkaline phosphatase with count 20.0
(Fetal hemoglobin, see 83030-83033, 85460)		85544	Lupus erythematosus (LE) cell prep 20.0
85362 Fibrin degradation (split) products (FDP)(FSP); agglutination, slide 12.0			(Lysozyme, see 85548)
85363 ethanol gel 10.0		85547	Mechanical fragility, RBC 30.0
		85548	Morphology of red blood cells, only 9.0
		85549	Muramidase, serum 52.0
			(Nitroblue tetrazolium dye test, see 86384)

	Unit Value		Unit Value
85555 Osmotic fragility, RBC	15.0	85665 Streptokinase titer (plasminogen acti- vator)	BR
85556 incubated, qualitative	18.0	85670 Thrombin time; plasma	20.0
85557 incubated, quantitative	60.0	85675 titer	12.0
(Packed cell volume, see 85014)		85700 Thromboplastin generation test; screening (Hicks-Pitney)	40.0
(Partial thromboplastin time, see 85730-85732)		85710 definitive, with platelet substitute ..	45.0
(Parasites, blood, e.g., malaria smears, see 87207)		85711 with patient's platelets	45.0
85560 Peroxidase stain, WBC	15.0	85720 all factors	BR
(Plasmin, see 85400)		(For individual clotting factors, see 85210 et seq.)	
(Plasminogen, see 85420)		85730 Thromboplastin time, partial (PTT); plasma or whole blood	30.0
(Plasminogen activator, see 85665)		85732 substitution, plasma	30.0
85575 Platelet; adhesiveness (in vivo)	45.0	(For thromboplastin inhibition test, see 85341)	
85576 aggregation (in vitro), any agent ..	BR	(Tourniquet test, see 85165)	
85577 retention (in vitro), glass bead	30.0	85810 Viscosity, blood	40.0
85580 count (Rees-Ecker)	14.0	85820 serum or plasma	40.0
85585 estimation on smear, only	10.0	(Von Willebrand factor assay, see 85426)	
(See also 85007)		(WBC count, see 85021-85031, 85048, 89050)	
85590 phase microscopy	20.0	85999 Unlisted hematology procedure	BR
85595 electronic technique	20.0	[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23A-340, filed 7/23/87; 87-03-005 (Order 86- 47), § 296-23A-340, filed 1/8/87.]	
(Protamine paracoagulation (PPP), see 85368)		WAC 296-23A-345 Immunology.	
85610 Prothrombin time	16.0	(Includes serology, immunohematology and blood banking)	
(See also 85618)		(Acetylcholine antireceptor antibody, see 86685)	
85612 Russell viper venom type (includes venom)	36.0	(Acid hemolysins, see 86281)	
85614 two stage	30.0	(Actinomycosis, see 86000-86009)	
85615 Prothrombin utilization (consump- tion)	40.0	(Adrenal cortex antibodies, RIA, see 86681)	
85618 Prothrombin - Proconvertin, P & P (Owren)	18.0		
(Red blood cell count, see 85021-85031)			
85630 Red blood cell size (Price-Jones)	40.0		
85632 Red blood cell peroxide hemolysis ...	30.0		
85635 Reptilase test	33.0		
(Reticulocyte count, see 85044)			
(Rumpel-Leede test, see 85165)		86000 Agglutinins; febrile, each	14.0
85650 Sedimentation rate (ESR); Wintrobe type	14.0	86002 panel (typhoid O & H, paratyphoid A & B, brucella and Proteus OX- 19)	45.0
85651 Westergren type	10.5	86004 warm	36.0
85660 Sickling of RBC, reduction, slide method	14.0	(Agglutinins and autohemolysins, see 86004, 86011-86013, 86281-86283, 86006-86009)	
(Sickling, electrophoresis, see 83020)		(Agglutinins, auto, see 86282-86283, 86011, 86013)	
(Sickling, solubility, S-D, see 83053)		(Agglutinins, cold, see 86006, 86013, 86282, 86283)	
(Sickling, turbidimetric (Sickdex dithionate), see 83052)		(Alpha-1 antitrypsin, see 86064, 86067, 86329)	
(Siderocytes, see 85535)		(Alpha-1 fetoprotein, see 86244)	
(Smears for parasites, malaria, etc., see 87207)		(Amebiasis, see 86171, 86280)	
(Staphylococcal clumping test, see 85369)			

	Unit Value		Unit Value
(Anti-AChR (acetylcholine receptor) antibody titer, see 86685)		(Antihyaluronidase titer, see 86315)	
86006 Antibody, qualitative, not otherwise specified; first antigen, slide or tube . . .	12.0	86038 Antinuclear antibodies (ANA), RIA . . .	55.0
86007 each additional antigen	7.5	(Antinuclear antibodies, fluorescent technique, see 86255, 86256)	
86008 Antibody, quantitative titer, not otherwise specified; first antigen	18.0	86045 Antistreptococcal carbohydrate, anti-A CHO	40.0
86009 each additional antigen	12.0	(Antistreptococcal antibody, anti-DNAse, see 86215)	
86011 Antibody, detection, leukocyte antibody	44.0	(Antistreptokinase titer, see 86590)	
86012 Antibody absorption, cold auto absorption; per serum	30.0	86060 Antistreptolysin O titer	20.0
(For elution, see 86019)		86063 screen	10.0
86013 differential	45.0	86064 Antitrypsin, alpha-1; RIA	20.0
86014 Antibody, platelet antibodies (agglutinins)	45.0	86066 Pi (Protease inhibitor) typing	20.0
86016 Antibodies, RBC, saline; high protein and antihuman globulin technique	30.0	86067 other method (specify)	20.0
(See also 86032)		(Autoagglutinins, see 86282, 86283)	
86017 with ABO Rh(D) typing (for holding blood instead of complete crossmatch)	24.0	(Autoantibodies, see specific antigens)	
86018 enzyme technique including antihuman globulin	17.0	(Blastomycosis, see 86006-86009)	
86019 elution, any method	45.0	86068 Blood crossmatch, complete standard technique, includes typing and antibody screening of recipient and donor; first unit	60.0
86021 Antibody identification; leukocyte antibodies	60.0	86069 each additional unit	45.0
86022 platelet antibodies	75.0	86072 Blood crossmatch; enzyme technique	10.5
86023 platelet associated immunoglobulin assay	BR	86073 screening for compatible unit saline and/or high protein	26.0
86024 RBC antibodies (8-10 cell panel) standard technique	38.0	86074 antiglobulin technique	15.0
86026 RBC antibodies (8-10 cell panel), with enzyme technique including antihuman globulin	52.0	(For enzyme technique, see 86018)	
(For absorption and elution, see 86012-86013, 86019)		86075 Blood crossmatch, minor only (plasma, Rh immune globulin), includes recipient and donor typing and antibody screening; first unit	44.0
86028 saline or high protein, each (Rh, AB, etc.)	12.0	86076 each additional unit	27.0
(Anti-DNA, see 86225)		(For incompatibility problems, see 86004, 86011-86014, 86016-86026, 86031-86035, 86068-86076)	
(Anti-deoxyribonuclease titer, see 86215)		(For typing, antibody screening and blood in lieu of crossmatch, see 86017)	
86031 Antihuman globulin test; direct (Coombs) 1-3 dilutions	12.0	86080 Blood typing; ABO only	12.0
86032 indirect, qualitative (broad, gamma or nongamma, each)	15.0	86082 ABO and Rho(D)	18.0
86033 indirect, titer (broad, gamma or nongamma each)	12.0	86090 MN	20.0
86034 enzyme technique, qualitative	30.0	86095 Blood typing, RBC antigens other than ABO or Rho(D); antiglobulin technique, each antigen	10.5
86035 drug sensitization, identification (e.g., penicillin)	75.0	86096 direct, slide or tube, including Rh subtypes, each antigen	10.5
(For antibody detection (screening), see 86016, 86017)		86100 Blood typing; Rho(D) only	12.0
		86105 Rh genotyping, complete	45.0
		(For Rho variant Du, see 86095)	
		86115 anti-Rh immunoglobulin testing (RhoGAM type)	68.0
		86120 special (Kell, Duffy)	BR

	Unit Value		Unit Value
86128 Blood autotransfusion, including collection, processing and storage	45.0	(For precipitin or agglutination rapid test for infectious agent, use 86403)	
(86129, 86131, 86134, 86138, and 86139 have been deleted)		(For enzyme immunoassay for drugs, use 82662)	
(Bovine milk antibody, see 86008, 86009)		86228 Enzyme immunoassay for infectious agent antibody	BR
(Brucellosis, see 86000-86002)		(For HTLV-III antibody tests, see 86312-86314)	
86140 C-reactive protein	20.0	86229 Enzyme immunoassay for chemical constituent	BR
(Candidiasis, see 86008)		(Eosinophils, nasal smear, see 89190)	
86149 Carcinoembryonic antigen (CEA); gel diffusion	60.0	86235 Antibody to specific nuclear antigen, any method, each	30.0
86151 RIA	60.0	(86240 and 86241 have been deleted)	
(Cat scratch disease, see 86171)		86243 Fc receptor assay, specify method . . .	BR
86155 Chemotaxis assay, specify method . . .	BR	86244 Feto-protein, alpha-1, RIA or EIA . .	57.0
(Coccidioidomycosis, see 86006-86009, 86171, 86490)		(86245 has been deleted)	
(Cold agglutinin or hemolysin, see 86006-86013, 86282, 86283)		(Filariasis, see 86280)	
86158 Complement; C'1 esterase	52.0	86255 Fluorescent antibody; screen	24.0
86159 C'2 esterase	52.0	86256 titer	36.0
86162 total (CH 50)	70.0	(Fluorescent technique for antigen identification in tissue, see 88346)	
86163 C'3 esterase	BR	86265 Frozen blood, preparation for freezing, each unit including processing and collection	BR
86164 C'4 esterase	BR	86266 with thawing	BR
(For complement fractions, quantitative, see 86329)		86267 with freezing and thawing	BR
86171 Complement fixation tests, each (e.g., cat scratch fever, coccidioidomycosis, histoplasmosis, psittacosis, rubella, streptococcus MG, syphilis)	40.0	(FTA, see 86650)	
(Coombs test, see 86031-86035)		(Gc grouping, see 86335)	
86185 Counterelectrophoresis, each antigen .	24.0	(Gel (agar) diffusion tests, see 86331)	
(For HAA, see 86285-86287)		(86272 and 86273 have been deleted)	
(Crossmatch, see 86068-86076)		(Gm grouping, see 86335)	
(86201 and 86202 have been deleted)		(Gonadotropins, chorionic, see 82996-82998, 84701)	
(Cryptococcosis, see 86008, 86009, 86255, 86256)		86277 Growth hormone, human (HGH), antibody, RIA	BR
(Cysticercosis, see 86280)		(HAA, see 86285-86287)	
86215 Deoxyribonuclease, antibody	36.0	(Ham test, see 86281)	
86225 Deoxyribonucleic acid (DNA) antibody	36.0	86280 Hemagglutination inhibition tests (HAI), each (e.g., amebiasis, rubella, viral)	60.0
(Diphtheria, see 86280)		86281 Hemolysins, acid (for paroxysmal hemoglobinuria) (Ham test)	24.0
(Direct antiglobulin test (Coombs), see 86031)		86282 Hemolysins and agglutinins, auto, screen, each	30.0
(Donath-Landsteiner screen, see 86008, 86009)		86283 incubated with glucose (e.g., ATP)	75.0
(Drug sensitization, RBC, see 86035)		(Cold, see 86006-86009; warm, see 86004; acid, see 86281)	
(Echinococcosis, see 86171, 86280)			
86227 Enzyme immunoassay for infectious agent antigen	BR		

	Unit Value	Unit Value
86285 Hepatitis B surface antigen (HB _s Ag) (Australian antigen, HAA); counter-electrophoresis method	18.0	30.0
		(Ouchterlony)
		(For ceruloplasmin by chemical method, see 82390)
86286 counterelectrophoresis with concentration of serum	24.0	(IgE, RIA, see 82785; RIST, see 86423)
86287 RIA or EIA	36.0	86335 Immunoglobulin typing (Gc, Gm, Inv), each
		BR
		(Insulin antibody, see 86016)
(For gel diffusion technique, see 86331; CF, see 86171; HAI, see 86280)		86337 Insulin antibodies, RIA
86288 Hepatitis B core antigen (HB _c Ag), RIA	BR	86338 Insulin factor antibodies, RIA
86289 Hepatitis B core antibody (HB _c Ab), RIA or EIA	BR	86340 Intrinsic factor antibodies, RIA
86290 IgM antibody (e.g., RIA, EIA, RPHA)	BR	(Intrinsic factor, antibody (fluorescent), see 86255, 86256)
86291 Hepatitis B surface antibody (HB _s Ab) (e.g., RIA, EIA, RPHA)	BR	(Inv grouping, see 86335)
86293 Hepatitis Be antigen (HB _e Ag) (e.g., RIA, EIA)	BR	(Latex fixation, see individual antigen or antibody; also 86006, 86007)
86295 Hepatitis Be antibody (HB _e Ab) (e.g., RIA, EIA)	BR	(LE cell preparation, see 85544)
86296 Hepatitis A antibody (HAAb) (e.g., RIA, EIA)	BR	(LE factor, see 86006, 86007, 86255, 86256)
		(Leishmaniasis, see 86280)
		(Leptospirosis, see 86006-86009)
(86297 Hepatitis A virus antibody has been deleted. To report, use 86296)		(Leukoagglutinins, see 86013, 86021)
86298 IgG antibody	BR	86343 Leukocyte histamine release test (LHR)
86299 IgM antibody	BR	BR
86300 Heterophile antibodies, screening (includes monotype test) slide or tube . .	20.0	86344 Leukocyte phagocytosis
86305 quantitative titer	30.0	(86345, 86346, and 86347 have been deleted)
86310 plus titers after absorption with beef cells and guinea pig kidney . . .	30.0	86349 Leukocyte transfusion (leukapheresis)
		BR
		(Lymphocyte culture, see 86353)
(Histoplasmosis, see 86006-86009, 86171)		(86351 has been deleted)
(HLA typing, see 86812-86817)		86353 Lymphocyte transformation, phyto-mitogen (phytohemagglutination, PHA) or other mitogen culture (MC) (e.g., tuberculin, candida)
(Hormones, see individual alphabetic listing in chemistry section)		120.0
86312 HTLV-III antibody detection; ELISA	BR	86357 Lymphocytes; T & B differentiation .
86314 confirmatory test (e.g., Western blot)	BR	86358 B-cell evaluation
		BR
		(Malaria, see 87207)
(Human growth hormone antibody, RIA, see 86277)		(86365 has been deleted)
(86315 has been deleted)		(Meloidosis, see 86280)
86320 Immunoelectrophoresis, serum, each specimen (plate)	100.0	86376 Microsomal antibody (thyroid); RIA .
86325 other fluids (e.g., urine) with concentration, each specimen	100.0	86377 other method (specify)
86327 crossed (2 dimensional assay)	BR	86378 Migration inhibitory factor test (MIF)
86329 Immunodiffusion; quantitative, each IgA, IgG, IgM, ceruloplasmin, transferrin, alpha-2, macroglobulin, complement fractions, alpha-1 antitrypsin, or other (specify)	30.0	BR
86331 gel diffusion, qualitative		(Milk antibody, antiovine, see 86008-86009)
		(Mitochondrial antibody, liver, see 86255-86256)
		(Mononucleosis screening slide, see 86006-86007)
		86382 Neutralization test, viral
		BR
		86384 Nitroblue tetrazolium dye test (NTD)
		BR

	Unit Value		Unit Value
(Ouchterlony diffusion, see 86331)		(Skin tests 86450, 86460, 86470, 86480, 86495, 86500, 86520, 86530, 86550, 86565, and 86570 have been deleted)	
(Parietal cell antibody, see 86255, 86256)		(Smooth muscle antibody, see 86255, 86256)	
86385 Paternity testing, ABO + Rh factors + MN (per individual)	37.5	(Sporotrichosis, see 86006-86009)	
86386 each additional antigen system	15.0	(Streptococcus MG, see 86171)	
(Penicillin antibody RBC, see 86035)		86590 Streptokinase, antibody	27.0
(86388, 86389, and 86391 have been deleted)		(Streptolysin O antibody, see antistreptolysin O, 86060-86063)	
(Platelet antibodies (agglutinins), see 86014)		(Streptobacillus, see 86008, 86009)	
(Platelet associated immunoglobulin assay, see 86023)		86592 Syphilis, precipitation or flocculation tests, qualitative VDRL, RPR, ART	9.0
(86392, 86393, and 86398 have been deleted)		(See also 89006, 89007)	
86402 Precipitin determination, gel diffusion, in aspergillosis, bagassosis, farmer lung, pigeon breeder disease, silo filler disease, other alveolitis (specify)	BR	86593 Syphilis, precipitation or flocculation tests, quantitative	15.0
86403 Precipitin (e.g., latex bead) or agglutination rapid test for infectious agent antigen	BR	(Syphilis serology, see also 86171)	
(For enzyme immunoassay for infectious agent antigen, use 86227)		(Tetanus, see 86280)	
86405 Precipitin test for blood (species identification)	BR	(Thyroglobulin antibody, see 86006-86009, 86171)	
(Pregnancy test, see 82996, 82997, 86006-86009)		(Thyroglobulin antibody, RIA, see 86800)	
(86415 and 86416 have been deleted)		86594 Thyroid autoantibodies	BR
(Psittacosis, CF, see 86171)		86595 Tissue culture	BR
86421 Radioallergosorbent test (RAST); up to 5 antigens	BR	(86597 tissue typing has been deleted. To report, use 86810-86822)	
86422 6 or more antigens	BR	86600 Toxoplasmosis, dye test	80.0
86423 Radioimmunosorbent test (RIST) IgE, quantitative	BR	(For CF, see 86171; IFA, see 86255, 86256)	
(Rapid plasma reagin test (RPR), see 86592)		86630 Transfer factor test (TFT)	BR
(86424, 86425, 86426, and 86427 have been deleted)		86650 Treponema antibodies, fluorescent, absorbed (FTA-Abs)	30.0
86430 Rheumatoid factor, latex fixation	12.0	86660 Treponema pallidum immobilization (TPI)	80.0
(RIST, see 86423)		86662 Treponema pallidum test, other, specify (e.g., TPIA, TPA, TPMB, TPCF, RPCF)	BR
(RPR, see 86592)		(Trichinosis, see 86006-86009)	
(Rubella, CF, see 86171; HAI, see 86280)		(Trypanosomiasis, see 86171, 86280)	
(Schistosomiasis agglutination, see 86006-86009)		(Tuberculosis, see 86580, 86585, 87116-87118, 87190)	
(Serologic test for syphilis (STS), see 86171, 86592, 86593)		(Vaccinia immune globulin, see 86274)	
86455 Skin test; anergy testing, one or more antigens	BR	(VDRL, see 86592, 86593)	
86490 coccidioidomycosis, each test	20.0	(Viral antibodies, see 86171, 86280, 86382)	
86510 histoplasmosis	20.0	(Visceral larval migrans, see 86280)	
86540 mumps	20.0	(Warm agglutinins, see 86004)	
86580 tuberculosis, patch or intradermal	20.0	(86670 has been deleted)	
86585 tuberculosis, tine test	12.0	86681 Adrenal cortex antibodies, RIA	31.0

	Unit Value		Unit Value
86685		Anti-AChR (acetylcholine receptor) antibody titer	BR
86800	31.0	Thyroglobulin antibody, RIA	31.0
86810		Tissue typing; for organ transplantation, including pretransplant crossmatch (donor) lymphocyte vs. recipient serum for nonspecific antibodies	BR
86812		HLA typing, A, B, or C (e.g., A10, B7, B27), single antigen	BR
86813		HLA typing, A, B, and/or C (e.g., A10, B7, B27), multiple antigens	BR
86816		HLA typing, DR, single antigen	BR
86817		HLA typing, DR, multiple antigen	BR
86821		lymphocyte culture, mixed (MLC)	BR
86822		lymphocyte culture, primed (PLC)	BR
86999		Unlisted immunology procedure	BR
[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23A-345, filed 7/23/87; 87-03-005 (Order 86-47), § 296-23A-345, filed 1/8/87.]			
WAC 296-23A-350 Microbiology.			
	Unit Value		
(Includes bacteriology, mycology, parasitology, and virology)			
87001	36.0	Animal inoculation, small animal; with observation	36.0
87003	45.0	with observation and dissection	45.0
87015	20.0	Concentration (any type), for parasites, ova, or tubercle bacillus (TB, AFB)	20.0
87040	48.0	Culture, bacterial, definitive, aerobic; blood (may include anaerobic screen)	48.0
87045	25.0	stool	25.0
87060	20.0	throat or nose	20.0
87070	16.0	any other source	16.0
(For urine, see 87086-87088)			
87072	BR	Culture, presumptive, pathogenic organisms, by commercial kit, any source except urine	BR
(For urine, see 87087)			
87075	36.0	Culture, bacterial, any source; anaerobic (isolation)	36.0
87076	60.0	definitive identification, including gas chromatography in addition to anaerobic culture	60.0
87081	15.0	Culture, bacterial, screening only, for single organisms	15.0
87082		Culture, presumptive, pathogenic organisms, screening only, by commercial kit (specify type); for single organisms	BR
87083	BR	multiple organisms	BR
87084		with colony estimation from density chart (includes throat cultures)	BR
87085		with colony count	BR
(For urine colony count, see 87086)			
87086		Culture, bacterial, urine; quantitative, colony count	15.0
87087		commercial kit	12.0
87088		identification, in addition to quantitative or commercial kit	12.0
87101		Culture, fungi, isolation; skin	15.0
87102		other source	18.0
87106		definitive identification, by culture, per organism, in addition to skin or other source	30.0
87109		Culture, mycoplasma, any source	75.0
87116		Culture, tubercle or other acid-fast bacilli (e.g., TB, AFB, mycobacteria); any source, isolation only	18.0
87117		concentration plus isolation	30.0
87118		definitive identification, per organism, (does not include isolation and/or concentration)	30.0
87140		Culture, typing; fluorescent method each antiserum	20.0
87143		gas liquid chromatography (GLC) method	45.0
87145		phage method	40.0
87147		serologic method agglutination grouping, per antiserum	20.0
87151		serologic method, speciation	20.0
87155		precipitin method, grouping, per antiserum	12.0
87158		other methods	20.0
87163		Culture, special extensive definitive diagnostic studies, beyond usual definitive studies	25.0
87164		Dark field examination, any source (e.g., penile, vaginal, oral, skin); includes specimen collection	60.0
87166		without collection	30.0
87173		Endotoxin, bacterial (pyrogens); animal inoculation	36.0
87174		chemical	24.0
87176		homogenization, tissue, for culture	15.0
87177		Ova and parasites, direct smears, concentration and identification	36.0
(Individual smears and procedures, see 87015, 87208-87211)			
(Trichrome, iron hemotoxylin and other special stains, see 88312)			
87181		Sensitivity studies, antibiotic; agar diffusion method, each antibiotic	40.0
87184		disc method, each plate (12 or less discs)	24.0
87186		microtiter, minimum inhibitory concentration (MIC), any number	

	Unit Value		Unit Value
		and interpretation (e.g., Sacco- manno technique)	BR
87188 of antibiotics	45.0		
87190 tube dilution method, each antibi- otic	30.0	(88109 has been deleted. For interpretation of smear, use 88104; for cell block interpretation, see 88150)	
87205 tubercle bacillus (TB, AFB), each drug	60.0	(For cervical or vaginal smears, see 88150)	
87206 Smear, primary source, with interpre- tation; routine stain for bacteria, fungi, or cell types	12.0	(For gastric intubation with lavage, see 89130- 89141)	
87206 fluorescent and/or acid fast stain for bacteria, fungi, or cell types . . .	18.0	(For x-ray localization, see 74340)	
87207 special stain for inclusion bodies or intracellular parasites (e.g., ma- laria, kala azar, herpes)	24.0	88125 Cytopathology, forensic (e.g., sperm)	75.0
87208 direct or concentrated, dry, for ova and parasites	12.0	88130 Sex chromatin identification; (Barr bodies)	40.0
(For concentration, see 87015; complete examina- tion, see 87177)		88140 peripheral blood smear, polymor- phonuclear "drum sticks"	40.0
(For complex special stains, see 88312-88313)		(For guard stain, see 88313)	
(For fat, meat fibers, nasal eosinophils, and starch, see miscellaneous section)		88150 Cytopathology, smears, cervical or vaginal (e.g., Papanicolaou), screening by technician under phy- sician supervision, up to three smears	BR
87210 wet mount with simple stain, for bacteria, fungi, ova, and/or para- sites	12.0	88151 requiring interpretation by physi- cian	BR
87211 wet and dry mount, with interpreta- tion, for ova and parasites	18.0	88155 with definitive hormonal evalua- tion (e.g., maturation index, kar- yopyknotic index, estrogenic index)	40.0
87220 Tissue examination for fungi (e.g., KOH slide)	BR	88160 Cytopathology, any other source; screening and interpretation	36.0
87250 Virus, inoculation of embryonated eggs, suitable tissue culture, or small animal, includes observation and dis- section	12.0	88161 preparation, screening and inter- pretation	BR
(Electron microscopy, see 88348)		88162 extended study involving over 5 slides and/or multiple stains	BR
(Inclusion bodies in tissue sections, see 88304- 88309; in smears, see 87207-87210; in fluids, see 88106)		(For obtaining specimen, see percutaneous needle biopsy under individual organ in Surgery)	
(87300 autogenous vaccine has been deleted. To re- port, use 87999)		(For aerosol collection of sputum, see 89350)	
87999 Unlisted microbiology procedure	BR	(For special stains, see 88312-88314)	
[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-350, filed 1/8/87.]		88170 Fine needle aspiration with or with- out preparation of smears; superfi- cial tissue (e.g., thyroid, breast, prostate)	BR
WAC 296-23A-355 Cytopathology.		88171 deep tissue under radiologic guidance	BR
	Unit Value	(For CT guidance, see 76360, 76361; for ultrasonic guidance, see 76942, 76943; for fluoroscopic guid- ance use 76003)	
88104 Cytopathology, fluids, washings or brushings, with centrifugation ex- cept cervical or vaginal; smears and interpretation	45.0	88172 Evaluation of fine needle aspirate with or without preparation of smears; immediate cytohistologic study to determine adequacy of specimen(s)	BR
88106 filter method only with interpre- tation	45.0	88173 interpretation and report	BR
88107 smears and filter preparation with interpretation	60.0		
88108 concentration technique, smears			

	Unit Value		Unit Value
88180			
Flow cytometry; each cell surface marker	BR		12.0
88182			
cell cycle or DNA analysis	BR		
88199			
Unlisted cytopathology procedure..	BR		
(For electron microscopy, see 88348)			
CYTOGENETIC STUDIES			
88260			
Chromosome analysis; lymphocytes, count 1-4 cells, screening	180.0		
88261			
count 1-4 cells, 1 karyotype	375.0		
88262			
count 1-20 cells for mosaicism, 2 karyotypes	525.0		
88265			
Chromosome analysis; myeloid cells, 2 karyotypes (Philadelphia chromosome)	225.0		
88267			
amniotic fluid, count 1-4 cells, 1 karyotype	600.0		
88268			
skin, count 1-4 cells, 1 karyotype	600.0		
88270			
other tissue cells, count 1-4 cells, 1 karyotype	BR		
88280			
additional karyotyping, each study	75.0		
88285			
additional cells counted, each study	15.0		
88299			
Unlisted cytogenetic study	BR		
SURGICAL PATHOLOGY			
(Procedures 88300 through 88399 include acces- sion, handling and reporting)			
88300			
Surgical pathology, gross examina- tion only	20.0		
Note: Only one of the numbers 88302-88309 should be used in re- porting specimens (single or multiple) that are removed during a single surgical procedure.			
88302			
Surgical pathology, gross and micro- scopic examination of presump- tively normal tissue(s), for identification and record purposes .	60.0		
88304			
Surgical pathology, gross and micro- scopic examination of presump- tively abnormal tissue(s); uncomplicated specimen	75.0		
88305			
single complicated or multiple uncomplicated specimen(s), with- out complex dissection	105.0		
88307			
single complicated specimen re- quiring complex dissection or multiple complicated specimens .	150.0		
88309			
complex diagnostic problem with or without extensive dissection ..	BR		
(For fine needle aspiration, preparation and inter- pretation of smears, see 88170-88173)			
88311			
decalcification procedure (list separately in addition to code for			
		surgical pathology examination) .	
		88312	
		Special stains (list separately in ad- dition to code for surgical pathology examination); Group I stains for microorganisms (e.g., Gridley, acid fast, methenamine silver), each ...	25.0
		88313	
		Group II, all other (e.g., iron, trichrome) except immunocytochemistry and immuno- peroxidase stains, each	12.0
		(For immunocytochemistry and immunoperoxidase tissue studies, see 88342)	
		88314	
		histochemical staining with fro- zen section(s)	BR
		88318	
		Determinative histochemistry to identify chemical components (e.g., copper, zinc)	BR
		88319	
		Determinative histochemistry to identify enzyme constituents	BR
		88323	
		Preparation of slides on referred material	BR
		88331	
		Preparation of frozen section(s) ...	BR
		88332	
		each additional frozen section during same visit to surgical operating suite	BR
		88342	
		Immunocytochemistry (including tissue immunoperoxidase), each an- tibody	BR
		(88345 has been deleted. To report, use 88346)	
		88346	
		Immunofluorescent study, each an- tibody	BR
		88348	
		Electron microscopy; diagnostic scanning	BR
		88349	
		scanning	BR
		88355	
		Morphometric analysis; skeletal muscle	BR
		88356	
		nerve	BR
		(88360 Whole organ sections has been deleted. To report, use 88399)	
		(88370 has been deleted. To report, use 88342)	
		88399	
		Unlisted surgical pathology proce- dure	BR
		[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23A-355, filed 7/23/87; 87-03-005 (Order 86- 47), § 296-23A-355, filed 1/8/87.]	
		WAC 296-23A-360 Miscellaneous.	
			Unit Value
		(Basal metabolic rate has been deleted. If necessary to report, use 89399)	
		(89005-89007 have been deleted)	
		89050	
		Cell count, miscellaneous body fluids (e.g., CSF, joint fluid), except blood .	12.0

	Unit Value
89051 with differential count	20.0
89060 Crystal identification by compensated polarizing lens analysis; synovial fluid (89070 has been deleted) (89080 has been deleted)	BR
89100 Duodenal intubation and aspiration; single specimen (e.g., simple bile study or afferent loop culture) plus appropriate test procedure	40.0
89105 collection of multiple fractional specimens with pancreatic or gall- bladder stimulation, single or double lumen tube	BR
(For radiological localization, see 74340)	
(For chemical analysis, see Chemistry and Toxicology)	
89125 Fat stain, feces, urine, sputum	15.0
89130 Gastric intubation and aspiration, di- agnostic, each specimen, for chemical analyses or cytopathology	20.0
89132 after stimulation	45.0
89135 Gastric intubation and aspiration, and fractional collections (e.g., gastric se- cretory study); one hour	60.0
89136 two hours	90.0
89140 two hours including gastric stimula- tion (e.g., histalog, pentagastrin)	105.0
89141 three hours, including gastric stim- ulation	120.0
(For radiologic localization of gastric tube, see 74340)	
(For chemical analyses, see 82926-82932)	
(Joint fluid chemistry, see Chemistry and Toxicol- ogy, this section)	
89160 Meat fibers, feces	12.0
(89180 has been deleted. To report, use 89190)	
89190 Nasal smear for eosinophils	BR
89205 Occult blood, any source except feces	10.5
(Occult blood, feces, see 82270)	
(Paternity tests, see 86385, 86386)	
(89210 has been deleted)	
89300 Semen analysis; presence and/or sperm motility of sperm including Huhner test	12.0
89310 motility and count	40.0
89320 complete (volume, count, motility and differential)	80.0
(Skin tests, see 86455-86585 and 95005-95199)	

	Unit Value
89325 Sperm evaluation, hamster penetra- tion test	BR
(For medicolegal identification of sperm, see 88125)	
(For complete spinal fluid examination, see 89070)	
(89345 has been deleted)	
89330 Cervical mucus penetration test, with or without spinnbarkeit test	BR
89350 Sputum, obtaining specimen, aerosol induced technique (separate proce- dure)	20.0
89355 Starch granules, feces	10.5
(For chloride and sodium analysis, see 82437, 84295)	
(Tissue culture, see 86595)	
(Tissue typing, see 86810-86822)	
89365 Water load test	BR
89399 Unlisted miscellaneous pathology test	BR
[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23A-360, filed 7/23/87; 87-03-005 (Order 86- 47), § 296-23A-360, filed 1/8/87.]	

HOSPITAL OUTPATIENT PHYSICAL THERAPY

WAC 296-23A-400 Hospital outpatient physical therapy rules. Hospitals should refer to WAC 296-20-010 through 296-20-125 for general information, rules, and billing instructions pertaining to the care of injured workers.

Physical therapy treatment will be permitted only upon consultation with and periodic review by an authorized health care practitioner and when performed by a licensed registered physical therapist or a physical therapist assistant serving under the direction of a licensed registered physical therapist.

Use of diapulse or similar machine on injured workers is not authorized. See WAC 296-20-03002 for further information.

No inpatient physical therapy treatment will be allowed when such treatment constitutes the only or major treatment received by the worker. See WAC 296-20-075 and 296-23A-100 for further information.

Biofeedback treatment may be rendered on physician's orders only, by R.P.T.'s certified in biofeedback and L.P.T.'s working under the supervision of a certified R.P.T. The extent of biofeedback treatment is limited to those procedures allowed within the scope of practice of the R.P.T. or L.P.T. See WAC 296-21-0501 for rules pertaining to the authorized conditions and the reporting requirements.

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-400, filed 1/8/87.]

WAC 296-23A-410 Muscle testing. (The maximum allowable is for payment in full, regardless of time required.)

	Unit Value
95831 Muscle testing manual (separate procedure); extremity (excluding hand) or trunk, with report	16.0
95832 hand (with or without comparison with normal side)	16.0
95833 total evaluation of body, excluding hands	16.0
95834 total evaluation of body, including hands	16.0
95842 Muscle testing, electrical: Reaction of degeneration, chronaxy, galvanic/tetanus ratio, one or more extremities, one or more methods	16.0
95851 Range of motion measurements and report (separate procedure); each extremity, excluding hand	16.0
95852 hand, with or without comparison with normal side	16.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-410, filed 1/8/87.]

WAC 296-23A-415 Modalities. Physician or therapist is required to be in constant attendance.

	Unit Value
(97000 has been deleted. To report, use 97010-97039)	
97010 Physical medicine treatment to one area, initial 30 minutes; hot or cold packs	12.0
97012 traction, mechanical	12.0
97014 electrical stimulation (unattended)	12.0
97016 vasopneumatic devices	12.0
97018 paraffin bath	12.0
97020 microwave	12.0
97022 whirlpool	12.0
97024 diathermy	12.0
97026 infrared	12.0
97028 ultraviolet	12.0
97039 unlisted modality (specify)	12.0
97040 modality; each additional 15 minutes	3.75
97050 Two or more modalities to the same area	13.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-415, filed 1/8/87.]

WAC 296-23A-420 Procedures. Therapist is required to be in constant attendance.

	Unit Value
(97100 has been deleted. To report, use 97110-97139)	
(97101 has been deleted. To report, use 97145)	
97110 Physical medicine treatment to one area, initial 30 minutes, each visit; therapeutic exercises	16.0
97112 neuromuscular reeducation	16.0
97114 functional activities	16.0
97116 gait training	16.0
97118 electrical stimulation (manual)	16.0
97122 traction, manual	16.0
97124 massage	16.0
97126 contrast baths	16.0
97128 ultrasound	16.0
97139 unlisted procedure (specify)	16.0
97145 Physical medicine treatment to one area, each additional 15 minutes	5.0
97220 Hubbard tank; initial 30 minutes, each visit	24.0
97221 each additional 15 minutes (maximum allowance, one hour)	5.0
97240 Pool therapy or Hubbard tank with therapeutic exercises; initial 30 minutes; each visit	30.0
97241 each additional 15 minutes (maximum allowance, one hour)	6.0
97260 Joint mobilization (cervical, thoracic, lumbosacral, sacroiliac, hand, wrist) (separate procedure); one area	16.0
97500 Orthotics training (dynamic bracing, splinting), upper extremities; initial 30 minutes, each visit	24.0
97501 each additional 15 minutes	12.0
97520 Prosthetic training; initial 30 minutes, each visit	24.0
97521 each additional 15 minutes	12.0
97530 Kinetic activities to increase coordination, strength and/or range of motion, one area (any two extremities or trunk), initial 30 minutes, each visit	24.0
97531 each additional 15 minutes	12.0
97540 Activities of daily living (ADL) and diversional activities; initial 30 minutes, each visit	24.0
97541 each additional 15 minutes	12.0
97554 Combination of modality(s) and/or procedure(s); initial 30 minutes	16.0
97555 Combination of modality(s) and/or procedure(s); each additional 15 minutes	5.0

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-03-005 (Order 86-47), § 296-23A-420, filed 1/8/87.]

WAC 296-23A-425 Tests and measurements.

	Unit Value
97600 Patient assessment and evaluation by a therapist, with report	16.0
97700 Office visit, including one of the following tests or measurements, with report; initial 30 minutes	24.0
a. Orthotic "check-out"	
b. Prosthetic "check-out"	
c. Activities of daily living "check-out"	
d. Biofeedback evaluation	
97701 each additional 15 minutes	12.0
97720 Extremity testing for strength, dexterity or stamina; initial 30 minutes, each visit	24.0
97721 each additional 15 minutes	12.0
97730 Performance-based physical capacities evaluation with report. Flat fee (97740, 97741 have been deleted. To report, see 97530, 97531)	\$375
97752 Muscle testing, torque curves during isometric and isokinetic exercise (e.g., by use of Cybex machine) . . .	24.0
99070 Supplies and materials provided by the therapist over and above those usually included with office visit or other services rendered. List item provided. Bill at cost.	BR

[Statutory Authority: RCW 51.04.020(4) and 51.04.030. 87-16-004 (Order 87-18), § 296-23A-425, filed 7/23/87; 87-03-005 (Order 86-47), § 296-23A-425, filed 1/8/87.]

Chapter 296-24 WAC

GENERAL SAFETY AND HEALTH STANDARDS

Reviser's note: To simplify the organization of this lengthy chapter and to assist the user in locating the desired subject matter, the agency has divided this chapter into subchapters. Only the names of such subchapters are shown in this chapter digest; for a full listing of sections within subchapters refer to the appropriate subchapter digest preceding the text of such sections.

Subchapters

- Part A-1 General, educational, medical and first-aid requirements. (WAC 296-24-001 through 296-24-073)
- Part B-1 Sanitation, temporary labor camps and nonwater carriage disposal systems. (WAC 296-24-120 through 296-24-13013)
- Part B-2 Safety color code for marking physical hazards, etc., window washing. (WAC 296-24-135 through 296-24-14519)
- Part C Machinery and machine guarding. (WAC 296-24-150 through 296-24-20730)
- Part D Materials handling and storage, including cranes, derricks, etc., and rigging. (WAC 296-24-215 through 296-24-29431)
- Part E Hazardous materials, flammable and combustible liquids, spray finishing, dip tanks. (WAC 296-24-295 through 296-24-450)
- Part F-1 Storage and handling of liquefied petroleum gases. (WAC 296-24-475 through 296-24-47517)

- Part F-2 Storage and handling of anhydrous ammonia. (WAC 296-24-510 through 296-24-51099)
- Part G-1 Means of egress. (WAC 296-24-550 through 296-24-56701)
- Part G-2 Fire protection. (WAC 296-24-585 through 296-24-58517)
- Part G-3 Fire suppression equipment. (WAC 296-24-590 through 296-24-63599)
- Part I Welding, cutting and brazing. (WAC 296-24-680 through 296-24-722)
- Part J-1 Working surfaces, guarding floors and wall openings, ladders, scaffolds. (WAC 296-24-735 through 296-24-85505)
- Part L Electrical. (WAC 296-24-950 through 296-24-960)

Part A-1

GENERAL, EDUCATIONAL, MEDICAL AND FIRST-AID REQUIREMENTS

WAC 296-24-003 Subsections, subdivisions, items, subitems, and segments.

WAC 296-24-003 Subsections, subdivisions, items, subitems, and segments. (1) That portion of section numeration appearing after the chapter designation appears in either a three digit or a five digit format (e.g. 296-24-330 and 296-24-33002). The final two digits of the section number are implied decimal extensions of the first three digits and represent a further division of the three digit enumeration.

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

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

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-003, filed 11/14/88; Order 76-6, § 296-24-003, filed 3/1/76; Order 73-5, § 296-24-003, filed 5/9/73 and Order 73-4, § 296-24-003, filed 5/7/73.]

Part B-1

SANITATION, TEMPORARY LABOR CAMPS AND NONWATER CARRIAGE DISPOSAL SYSTEMS

WAC 296-24-12007 Toilet facilities.

WAC 296-24-12007 Toilet facilities. (1) General.

(a) Except as otherwise indicated in this section, toilet facilities, in toilet rooms separate for each sex, shall be provided in all places of employment in accordance with Table B-1 of this section. The number of facilities to be provided for each sex shall be based on the number of employees of that sex for whom the facilities are furnished. Where toilet rooms will be occupied by no more than 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. Where such single-occupancy rooms have more than one toilet facility, only one such facility in each toilet room shall be counted for the purpose to Table B-1.

TABLE B-1

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

Where toilet facilities will not be used by women, urinals may be provided instead of water closets, except that the number of water closets in such cases shall not be reduced to less than 2/3 of the minimum specified.

(b) The requirements of subdivision (a) of this subsection do not apply to mobile crews or to normally unattended work locations so long as employees working at these locations have transportation immediately available to nearby toilet facilities which meet the other requirements of this section.

(c) The sewage disposal method shall not endanger the health of employees.

(d) Toilet paper with holder shall be provided for every water closet.

(2) Construction of toilet rooms. Each water closet shall occupy a separate compartment with a door and walls or partitions between fixtures sufficiently high to assure privacy.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-24-12007, filed 11/30/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 82-02-003 (Order 81-32), § 296-24-12007, filed 12/24/81. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-24-12007, filed 11/13/80; Order 74-27, § 296-24-12007, filed 5/7/74; Order 73-5, § 296-24-12007, filed 5/9/73 and Order 73-4, § 296-24-12007, filed 5/7/73.]

Part B-2

SAFETY COLOR CODE FOR MARKING PHYSICAL HAZARDS, ETC., WINDOW WASHING

WAC

296-24-14011 Accident prevention tags.

WAC 296-24-14011 Accident prevention tags. (1) Scope and purpose.

(a) This section applies to all accident prevention tags used to identify hazardous conditions and provide a message to employees with respect to hazardous conditions as set forth in subsection (3) of this section, or to meet the specific requirements of other WAC requirements.

(b) Tags are a temporary means of warning all concerned of a hazardous condition, defective equipment, radiation hazards, etc. The tags are not to be considered as a complete warning method, but should be used until a positive means can be employed to eliminate the hazard; for example, a "do not start" tag on power equipment shall be used for a few moments or a very short time until the switch in the system can be locked out; a "defective equipment" tag shall be placed on a damaged ladder and immediate arrangements made for the ladder to be taken out of service and sent to the repair shop.

(c) This section does not apply to construction or agriculture.

(2) Definitions.

(a) "Biological hazard" or "BIOHAZARD" means those infectious agents presenting a risk of death, injury or illness to employees.

(b) "Major message" means that portion of a tag's inscription that is more specific than the signal word and that indicates the specific hazardous condition or the instruction to be communicated to the employee. Examples include: "High Voltage," "Close Clearance," "Do Not Start," or "Do Not Use" or a corresponding pictograph used with a written text or alone.

(c) "Pictograph" means a pictorial representation used to identify a hazardous condition or to convey a safety instruction.

(d) "Signal word" means that portion of a tag's inscription that contains the word or words that are intended to capture the employee's immediate attention.

(e) "Tag" means a device usually made of card, paper, pasteboard, plastic or other material used to identify a hazardous condition.

(3) Use.

(a) Tags shall be used as a means to prevent accidental injury or illness to employees who are exposed to hazardous or potentially hazardous conditions, equipment or operations which are out of the ordinary, unexpected or not readily apparent.

(b) Tags shall be used until such time as the identified hazard is eliminated or the hazardous operation is completed. Tags need not be used where signs, guarding or other positive means of protection are being used.

(c) Do not start tags shall be placed in a conspicuous location or shall be placed in such a manner that they effectively block the starting mechanism which would cause hazardous conditions should the equipment be energized. See Fig. J-11.

(4) General tag criteria.

(a) All required tags shall meet the following criteria:

(i) Tags shall contain a signal word and a major message.

(ii) The signal word shall be either "Danger," "Caution," or "Biological Hazard," "biohazard," or the biological hazard symbol.

(iii) The major message shall indicate the specific hazardous condition or the instruction to be communicated to the employee.

(b) The signal word shall be readable at a minimum distance of five feet (1.52 m) or such greater distance as warranted by the hazard.

(c) The tag's major message shall be presented in either pictographs, written text or both.

(d) The signal word and the major message shall be understandable to all employees who may be exposed to the identified hazard.

(e) All employees shall be informed as to the meaning of the various tags used throughout the workplace and what special precautions are necessary.

(f) Tags shall be affixed as close as safely possible to their respective hazards by a positive means such as string, wire, or adhesive that prevents their loss or unintentional removal.

(g) The tag and attachment method or device used shall be constructed of such material that they will not be likely to deteriorate in the environment in which the tag is used during the time period of intended use.

(5) Danger tags.

(a) Danger tags shall be used in major hazard situations where an immediate hazard presents a threat of death or serious injury to employees. Danger tags shall be used only in these situations. See Fig. J-11.

(b) All employees should be instructed that danger tags indicate immediate danger and that special precautions are necessary.

(6) Caution tags.

(a) Caution tags shall be used in minor hazard situations where a nonimmediate or potential hazard or unsafe practice presents a lesser threat of employee injury. Caution tags shall be used only in these situations. See Fig. J-12.

(b) All employees should be instructed that caution tags indicate a possible hazard against which proper precautions should be taken.

(7) Warning tags. Warning tags may be used to represent a hazard level between "Caution" and "Danger," instead of the required "Caution" tag, provided that they have a signal word of "Warning," an appropriate major message, and otherwise meet the general tag criteria of subsection (4) of this section.

(8) Out of order tags. Out of order tags should be used only for the specific purpose of indicating that a piece of equipment, machinery, etc., is out of order and to attempt to use it might present a hazard. (See Fig. J-13.)

(9) Radiation tags.

(a) The standard background for radiation tags shall be yellow; the panel shall be reddish purple. Any letters used against the yellow background shall be black. The colors shall be those of opaque glossy samples as specified in Table 1, Fundamental Specification of Safety Colors for CIE Standard Source "C" American National Standard Safety Color Code for Marking Physical Hazards and the Identification of Certain Equipment, Z53.1-1971.

(b) The method of dimension, design, and orientation of the standard symbol (one blade pointed downward and centered on the vertical axis) shall be executed as illustrated in Figure J-14. The symbol shall be prominently displayed and of a size consistent with the size of the equipment or area in which it is to be used.

(10) Biological hazard tags.

(a) Biological hazard tags shall be used to identify the actual or potential presence of a biological hazard and to identify equipment, containers, rooms, experimental animals, or combinations thereof, that contain or are contaminated with hazardous biological agents.

(b) The symbol design for biological hazard tags shall conform to the design shown in Fig. J-15.

(11) Other tags. Other tags may be used in addition to those required by this section or in other situations where this section does not require tags, provided that they do not detract from the impact or visibility of the signal word and major message of any required tag.

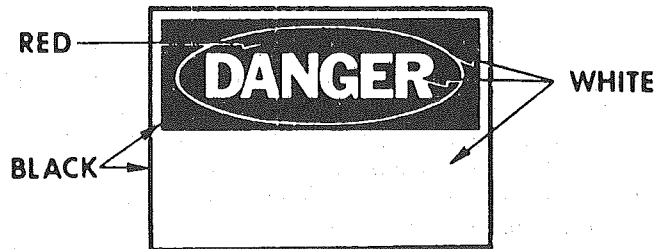


Fig. J-1

Danger Sign

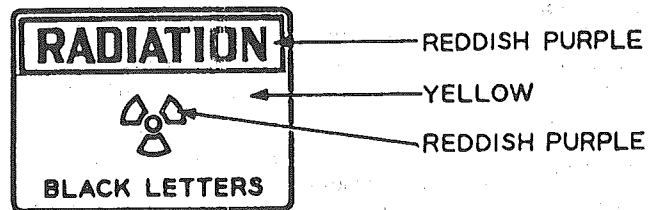


Fig. J-2

Radiation Warning Sign

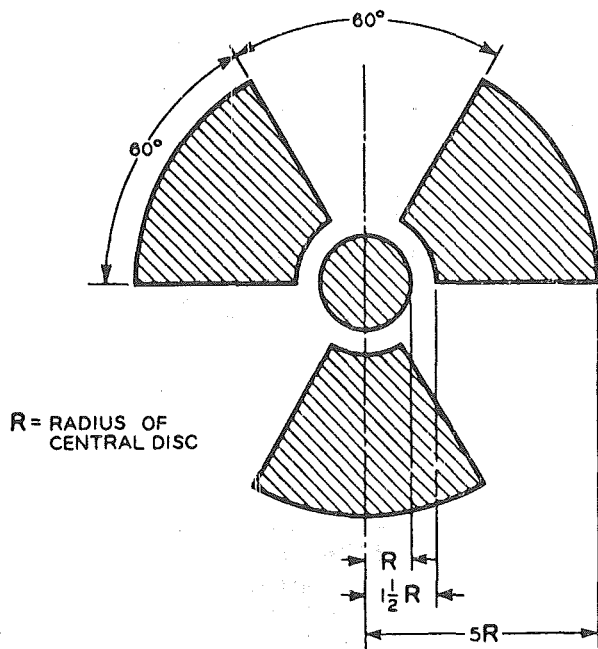


Fig. J-3
Standard Radiation Symbol

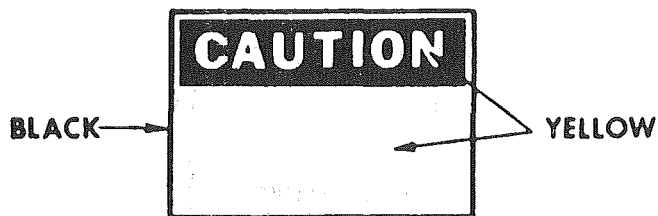


Fig. J-4
Caution Sign

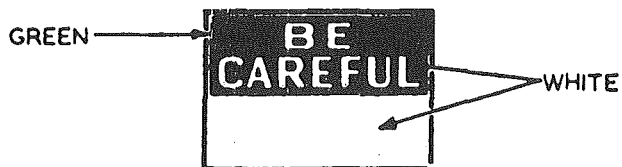
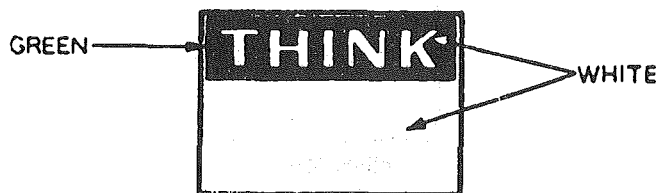


Fig. J-5
Safety Instruction Signs

(Note: The words "think" and "be careful," given here, are only illustrations. Other wordings may be used.)



Fig. J-6
Directional Signs

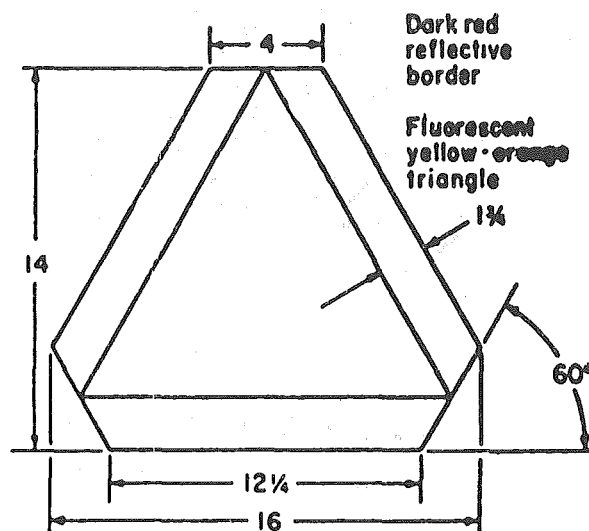


Fig. J-7
Slow-Moving Vehicle Emblem

Note: All dimensions are in inches.

POISON:



ELECTRICITY:

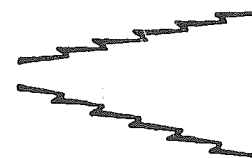
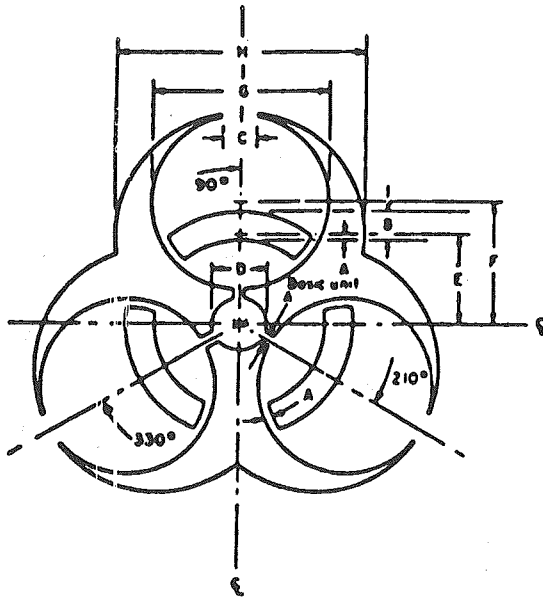
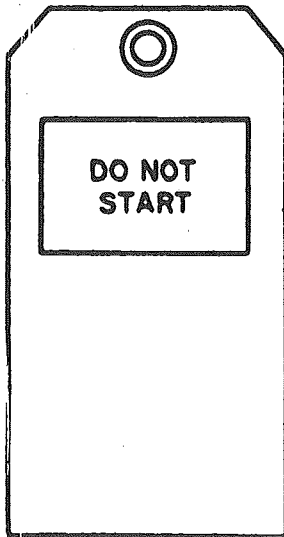


Fig. J-8
Symbols Used on Signs



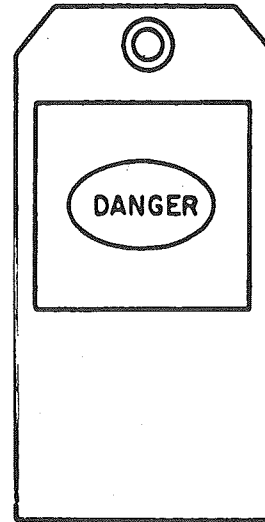
Dimension	A	B	C	D	E	F	G	H
Units	1	3 1/2	4	6	11	15	21	30

Fig. J-9
Symbol for Biological Hazard



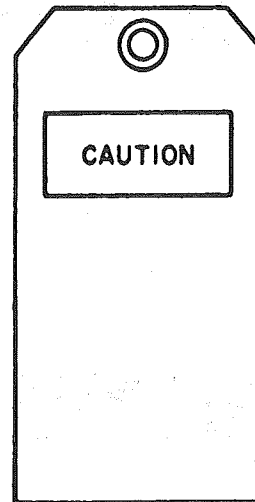
White tag
white letters on
red square

Fig. J-10
Do Not Start Tag



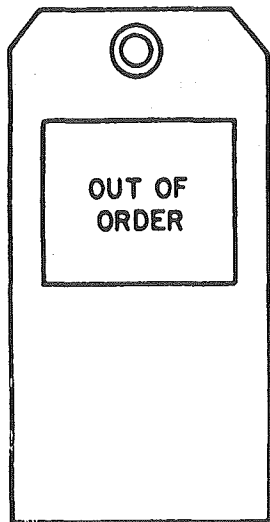
White tag
white letters on
red oval with a
black square

Fig. J-11
Danger Tag



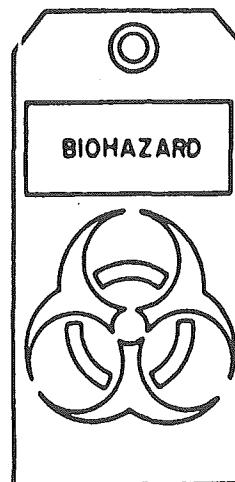
Yellow tag
yellow letters on a
black background

Fig. J-12
Caution Tag



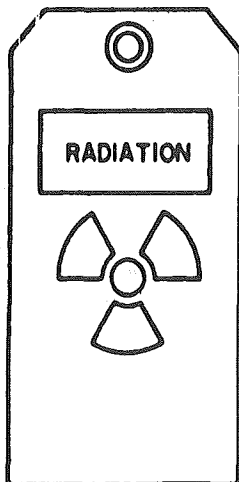
White tag
white letters on
black background

Fig. J-13
Out of Order Tag



White tag
black letters on
fluorescent orange
background and
symbol

Fig. J-15
Biological Hazard Tag



Yellow tag
yellow letters in
reddish-purple panel
(Added wording in black
on yellow background)

Fig. J-14
Radiation Tag

Fig. J-15

Biological Hazard Tag

TABLE J-1

STANDARD PROPORTIONS FOR DANGER SIGNS

Sign size, inches	Black rectangular panel, inches		Red oval, inches		Word danger, height inches	Maximum space available for sign wording, inches
	Height	Width	Height	Width		
HORIZONTAL PATTERN						
7x10	3 1/4	9 3/8	2 7/8	8 1/2	1 7/16	2 3/4 x 9 3/8
10x14	4 5/8	13 3/8	4 1/8	11 7/8	2 1/16	4 1/4 x 13 3/8
14x20	6 1/2	19 3/8	5 3/4	17	2 7/8	6 1/4 x 19 3/8
20x28	9 1/4	27 3/8	8 1/4	23 7/8	4 1/8	9 1/2 x 27 3/8
UPRIGHT PATTERN						
10x 7	2 3/8	6 3/8	2 1/8	5 7/8	1 1/16	6 3/8 x 6 3/8
14x10	3 1/4	9 3/8	2 7/8	8 1/2	1 7/16	9 1/2 x 9 3/8
20x14	4 5/8	13 3/8	4 1/8	11 7/8	2 1/16	14 x 13 3/8
28x20	6 1/2	19 3/8	5 3/4	17	2 7/8	20 1/4 x 19 3/8

TABLE J-2

STANDARD PROPORTIONS FOR CAUTION SIGNS

Sign size, inches	Black rectangular panel, inches		Word "Caution" height of letter, inches	Maximum space available for sign wording below panel inches	
	height	width		height	width
HORIZONTAL PATTERN					
7 x 10	2 1/4	9 3/8	1 5/8	3 1/4	9 3/8
10 x 14	3 1/4	13 3/8	2 1/4	5 1/2	13 3/8
14 x 20	3 3/4	19 3/8	2 3/4	9	19 3/8
20 x 28	4 1/4	27 3/8	3 1/4	14 1/2	27 3/8
UPRIGHT PATTERN					
10 x 7	1 5/8	6 3/8	1 1/8	7	6 3/8
14 x 10	2 1/4	9 3/8	1 5/8	10 1/2	9 3/8

TABLE J-2—cont.

Sign size, inches height width	Black rectangular panel, inches height width		Word "Caution" height of letter, inches	Maximum space available for sign wording below panel inches height width	
	height	width		height	width
20 x 14	3 1/4	13 3/8	2 1/4	15 1/2	13 3/8
28 x 20	3 3/4	19 3/8	2 3/4	24	19 3/8

TABLE J-3

STANDARD PROPORTIONS FOR SAFETY INSTRUCTION SIGNS

[TABLE J-3: PART 1 — "Think" Safety Sign]

Sign size, inches, height, width	Maximum Green rectangular panel, inches, height, width		Word "Think" height letters, inches	Space available for sign wording below panel, inches height, width
	height	width		
7x10	2 3/4	9 3/8	1 5/8	3 1/2 x 9 3/8
10x14	3 1/4	13 3/8	2 1/4	5 1/2 x 13 3/8
14x20	3 3/4	19 3/8	2 3/4	9 x 19 3/8
20x28	4 1/4	27 3/8	3 1/4	14 1/2 x 27 3/8

[TABLE J-3: PART 2 — "Be Careful" Safety Sign]

Sign size, inches height, width	Maximum Green panel, inches, height, width		Word "Be" height of letters, inches	Word "Careful" height of letters, inches	Space available for sign wording below panel, inches, height, width
	height	width			
7x10	3 3/8	9 3/8	1 1/4	1 3/16	2 1/2 x 9 3/8
10x14	4 1/4	13 3/8	1 3/4	2 3/16	4 x 13 3/8
14x20	6 1/4	19 3/8	2 1/2	3 1/8	6 x 19 3/8
20x28	9 1/2	27 3/8	3 1/2	4 3/8	9 1/4 x 27 3/8

TABLE J-4

STANDARD PROPORTIONS FOR DIRECTIONAL SIGNS

Sign size inches height	Black rectangular panel, inches height width	White arrow, inches				Maximum space for sign wording below panel height
		Overall length	Arrow head height width	Arrow shaft height	Arrow tail height width	
6 1/2x14	3 1/4 x 13 3/8	12 5/8	2 3/4 x 3	1 1/8	2 3/8 x 3 1/4	2 1/4 x 13 3/8
9x20	4 1/2 x 19 3/8	18 5/8	3 3/4 x 4 1/8	1 5/8	3 1/4 x 4 1/2	3 3/8 x 19 3/8
12x28	6 x 27 3/8	26 5/8	5 1/8 x 5 5/8	2 1/8	4 3/8 x 6	4 3/4 x 27 3/8
15x36	7 1/2 x 35 3/8	34 5/8	6 3/8 x 6 7/8	2 5/8	5 1/2 x 7 1/2	6 1/4 x 35 3/8

Appendix A—Recommended color coding.

While the standard does not specifically mandate colors to be used on accident prevention tags, the following color scheme is recommended by OSHA for meeting the requirements of this section:

"DANGER"—Red, or predominantly red, with lettering or symbols in a contrasting color.

"CAUTION"—Yellow, or predominantly yellow, with lettering or symbols in a contrasting color.

"WARNING"—Orange, or predominantly orange, with lettering or symbols in a contrasting color.

"BIOLOGICAL HAZARD"—Fluorescent orange or orange-red, or predominantly so, with lettering or symbols in a contrasting color.

Appendix B—References for further information.

The following references provide information which can be helpful in understanding the requirements contained in various sections of the standard:

1. Bresnahan, Thomas F., and Bryk, Joseph. "The Hazard Association Values of Accident Prevention Signs", *Journal of American Society of Safety Engineers: January 1975.*

2. Dreyfuss, H., *Symbol Sourcebook*, McGraw Hill: New York, NY, 1972.

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[Statutory Authority: RCW 49.17.050(2) and 49.14.040 [49.17.040]. 87-07-022 (Order 87-01), § 296-24-14011, filed 3/12/87; Order 76-6, § 296-24-14011, filed 3/1/76; Order 73-5, § 296-24-14011, filed 5/9/73 and Order 73-4, § 296-24-14011, filed 5/7/73.]

Part C

MACHINERY AND MACHINE GUARDING

WAC

296-24-19501	Definitions.
296-24-19507	Safeguarding the point of operation.
296-24-19515	Repealed.
296-24-19517	Presence sensing device initiation (PSDI).
296-24-20699	Appendices A through D are added to Part C of chapter 296-24 WAC, to describe the federal procedures for third-party validation and certification of presence sensing devices on mechanical power presses.
296-24-20700	Appendix A to WAC 296-24-195.
296-24-20710	Appendix B to WAC 296-24-195.
296-24-20720	Appendix C to WAC 296-24-195.
296-24-20730	Appendix D to WAC 296-24-195.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS SUBCHAPTER

296-24-19515	Reports of point of operation injuries—Mechanical power presses. [Order 76-6, § 296-24-19515, filed 3/1/76.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
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WAC 296-24-19501 Definitions. (1) "Antirepeat" means the part of the clutch/brake control system designed to limit the press to a single stroke if the tripping means is held operated. Antirepeat requires release of all tripping mechanisms before another stroke can be initiated. "Antirepeat" is also called single stroke reset or reset circuit.

(2) "Brake" means the mechanism used on a mechanical power press to stop and/or hold the crankshaft, either directly or through a gear train, when the clutch is disengaged.

(3) "Bolster plate" means the plate attached to the top of the bed of the press having drilled holes or T-slots for attaching the lower die or die shoe.

(4) "Clutch" means the coupling mechanism used on a mechanical power press to couple the flywheel to the crankshaft, either directly or through a gear train.

(5) "Full revolution clutch" means a type of clutch that, when tripped, cannot be disengaged until the crankshaft has completed a full revolution and the press slide a full stroke.

(6) "Part revolution clutch" means a type of clutch that can be disengaged at any point before the crankshaft has completed a full revolution and the press slide a full stroke.

(7) "Direct drive" means the type of driving arrangement wherein no clutch is used; coupling and decoupling of the driving torque is accomplished by energization and deenergization of a motor. Even though not employing a clutch, direct drives match the operational characteristics of "part revolution clutches" because the driving power may be disengaged during the stroke of the press.

(8) "Concurrent" means acting in conjunction, and is used to describe a situation wherein two or more controls exist in an operated condition at the same time.

(9) "Continuous" means uninterrupted multiple strokes of the slide without intervening stops (or other clutch control action) at the end of individual strokes.

(10) "Counterbalance" means the mechanism that is used to balance or support the weight of the connecting rods, slide, and slide attachments.

(11) "Device" means a press control or attachment that:

(a) Restrains the operator from inadvertently reaching into the point of operation, or

(b) Prevents normal press operation if the operator's hands are inadvertently within the point of operation, or

(c) Automatically withdraws the operator's hands if the operator's hands are inadvertently within the point of operation as the dies close, or

(d) Prevents the initiation of a stroke, or stops the stroke in progress, when there is an intrusion through the sensing field by any part of the operator's body or by any other object.

(12) "Presence sensing device" means a device designed, constructed and arranged to create a sensing field or area that signals the clutch/brake control to deactivate the clutch and activate the brake of the press when any part of the operator's body or a hand tool is within such field or area.

(13) "Gate or movable barrier device" means a movable barrier arranged to enclose the point of operation before the press stroke can be started.

(14) "Holdout or restraint device" means a mechanism, including attachments for operator's hands, that when anchored and adjusted prevent the operator's hands from entering the point of operation.

(15) "Pull-out device" means a mechanism attached to the operator's hands and connected to the upper die or slide of the press, that is designed, when properly adjusted, to withdraw the operator's hands as the dies close, if the operator's hands are inadvertently within the point of operation.

(16) "Sweep device" means a single or double arm (rod) attached to the upper die or slide of the press and designed to move the operator's hands to a safe position as the dies close, if the operator's hands are inadvertently within the point of operation.

(17) "Two hand control device" means a two hand trip that further requires concurrent pressure from both hands of the operator during a substantial part of the die-closing portion of the stroke of the press.

(18) "Die" means the tooling used in a press for cutting or forming material. An upper and a lower die make a complete set.

(19) "Die builder" means any person who builds dies for power presses.

(20) "Die set" means a tool holder held in alignment by guide posts and bushings and consisting of a lower shoe, an upper shoe or punch holder, and guide posts and bushings.

(21) "Die setter" means an individual who places or removes dies in or from mechanical power presses, and who, as a part of his duties, makes the necessary adjustments to cause the tooling to function properly and safely.

(22) "Die setting" means the process of placing or removing dies in or from a mechanical power press, and

the process of adjusting the dies, other tooling and safeguarding means to cause them to function properly and safely.

(23) "Die shoe" means a plate or block upon which a die holder is mounted. A die shoe functions primarily as a base for the complete die assembly, and, when used, is bolted or clamped to the bolster plate or the face of slide.

(24) "Ejector" means a mechanism for removing work or material from between the dies.

(25) "Face of slide" means the bottom surface of the slide to which the punch or upper die is generally attached.

(26) "Feeding" means the process of placing or removing material within or from the point of operation.

(27) "Automatic feeding" means feeding wherein the material or part being processed is placed within or removed from the point of operation by a method or means not requiring action by an operator on each stroke of the press.

(28) "Semiautomatic feeding" means feeding wherein the material or part being processed is placed within or removed from the point of operation by an auxiliary means controlled by operator on each stroke of the press.

(29) "Manual feeding" means feeding wherein the material or part being processed is handled by the operator on each stroke of the press.

(30) "Foot control" means the foot operated control mechanism designed to be used with a clutch or clutch/brake control system.

(31) "Foot pedal" means the foot operated lever designed to operate the mechanical linkage that trips a full revolution clutch.

(32) "Guard" means a barrier that prevents entry of the operator's hands or fingers into the point of operation.

(33) "Die enclosure guard" means an enclosure attached to the die shoe or stripper, or both, in a fixed position.

(34) "Fixed barrier guard" means a die space barrier attached to the press frame.

(35) "Interlocked press barrier guard" means a barrier attached to the press frame and interlocked so that the press stroke cannot be started normally unless the guard itself, or its hinged or movable sections, enclose the point of operation.

(36) "Adjustable barrier guard" means a barrier requiring adjustment for each job or die setup.

(37) "Guide post" means the pin attached to the upper or lower die shoe, operating within the bushing on the opposing die shoe, to maintain the alignment of the upper and lower dies.

(38) "Hand feeding tool" means any hand held tool designed for placing or removing material or parts to be processed within or from the point of operation.

(39) "Inch" means an intermittent motion imparted to the slide (on machines using part revolution clutches) by momentary operation of the "inch" operating means. Operation of the "inch" operating means engages the driving clutch so that a small portion of one stroke or indefinite stroking can occur, depending upon the length

of time the "inch" operating means is held operated. "Inch" is a function used by the die setter for setup of dies and tooling, but is not intended for use during production operations by the operator.

(40) "Jog" means an intermittent motion imparted to the slide by momentary operation of the drive motor, after the clutch is engaged with the flywheel at rest.

(41) "Knockout" means a mechanism for releasing material from either die.

(42) "Liftout" means the mechanism also known as knockout.

(43) "Operator's station" means the complete complement of controls used by or available to an operator on a given operation for stroking the press.

(44) "Pinch point" means any point other than the point of operation at which it is possible for a part of the body to be caught between the moving parts of a press or auxiliary equipment, or between moving and stationary parts of a press or auxiliary equipment or between the material and moving part or parts of the press or auxiliary equipment.

(45) "Point of operation" means the area of the press where material is actually positioned and work is being performed during any process such as shearing, punching, forming, or assembling.

(46) "Press" means a mechanically powered machine that shears, punches, forms or assembles metal or other material by means of cutting, shaping, or combination dies attached to slides. A press consists of a stationary bed or anvil, and a slide (or slides) having a controlled reciprocating motion toward and away from the bed surface, the slide being guided in a definite path by the frame of the press.

(47) "Repeat" means an unintended or unexpected successive stroke of the press resulting from a malfunction.

(48) "Safety block" means a prop that, when inserted between the upper and lower dies or between the bolster plate and the face of the slide, prevents the slide from falling of its own deadweight.

(49) "Single stroke" means one complete stroke of the slide, usually initiated from a full open (or up) position, followed by closing, (or down), and then a return to the full open position.

(50) "Single stroke mechanism" means an arrangement used on a full revolution clutch to limit the travel of the slide to one complete stroke at each engagement of the clutch.

(51) "Slide" means the main reciprocating press member. A slide is also called a ram, plunger, or platen.

(52) "Stop control" means an operator control designed to immediately deactivate the clutch control and activate the brake to stop slide motion.

(53) "Stripper" means a mechanism or die part for removing the parts or material from the punch.

(54) "Stroking selector" means the part of the clutch/brake control that determines the type of stroking when the operating means is actuated. The stroking selector generally includes positions for "off" (clutch control), "inch," "single stroke," and "continuous" (when continuous is furnished).

(55) "Trip or (tripping)" means activation of the clutch to "run" the press.

(56) "Turnover bar" means a bar used in die setting to manually turn the crankshaft of the press.

(57) "Two-hand trip" means a clutch actuating means requiring the concurrent use of both hands of the operator to trip the press.

(58) "Unitized tooling" means a type of die in which the upper and lower members are incorporated into a self-contained unit so arranged as to hold the die members in alignment.

(59) "Control system" means sensors, manual input and mode selection elements, interlocking and decision-making circuitry, and output elements to the press operating mechanism.

(60) "Brake monitor" means a sensor designed, constructed, and arranged to monitor the effectiveness of the press braking system.

(61) "Presence sensing device initiation" means an operating mode of indirect manual initiation of a single stroke by a presence sensing device when it senses that work motions of the operator, related to feeding and/or removing parts, are completed and all parts of the operator's body or hand tools are safely clear of the point of operation.

(62) "Safety system" means the integrated total system, including the pertinent elements of the press, the controls, the safeguarding and any required supplemental safeguarding, and their interfaces with the operator, and the environment, designed, constructed, and arranged to operate together as a unit, such that a single failure or single operating error will not cause injury to personnel due to point of operation hazards.

(63) "Authorized person" means one to whom the authority and responsibility to perform a specific assignment has been given by the employer.

(64) "Certification" or "certify" means, in the case of design certification/validation, that the manufacturer has reviewed and tested the design and manufacture, and in the case of installation certification/validation and annual recertification/revalidation, that the employer has reviewed and tested the installation, and concludes in both cases that the requirements of WAC 296-24-19503 through 296-24-19515 and 296-24-20700 have been met. The certifications are made to the validation organization.

(65) "Validation" or "validate" means for PSDI safety systems that a WISHA recognized third-party validation organization:

(a) For design certification/validation has reviewed the manufacturer's certification that the PSDI safety system meets the requirements of WAC 296-24-19503 through 296-24-19515 and 296-24-20700 and the underlying tests and analyses performed by the manufacturer, has performed additional tests and analyses which may be required by WAC 296-24-19503 through 296-

24-19515 and 296-24-20700, and concludes that the requirements of WAC 296-24-19503 through 296-24-19515 and 296-24-20700 have been met; and

(b) For installation certification/validation and annual recertification/revalidation has reviewed the employer's certification that the PSDI safety system meets the requirements of WAC 296-24-19503 through 296-24-19515 and 296-24-20700 and the underlying tests performed by the employer, has performed additional tests and analyses which may be required by WAC 296-24-19503 through 296-24-19515 and 296-24-20700, and concludes that the requirements of WAC 296-24-19503 through 296-24-19515 and 296-24-20700 have been met.

(66) "Certification/validation" and "certify/validate" means the combined process of certification and validation.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-19501, filed 11/14/88; Order 76-6, § 296-24-19501, filed 3/1/76; Order 73-5, § 296-24-19501, filed 5/9/73 and Order 73-4, § 296-24-19501, filed 5/7/73.]

WAC 296-24-19507 Safeguarding the point of operation. (1) General requirements.

(a) It shall be the responsibility of the employer to provide and insure the usage of "point of operation guards" or properly applied and adjusted point of operation devices on every operation performed on a mechanical power press. See Table O-10.

(b) The requirement of (a) of this subsection shall not apply when the point of operation opening is one-fourth inch or less. See Table O-10.

TABLE O-10

MAXIMUM OPENINGS UNDER GUARDS

Distance of Opening From Point of Operation Hazard (Inches)	Maximum Openings Under Guard (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

MAXIMUM OPENINGS THROUGH GUARDS

Material	Guard Clearance From Hazard Point	Largest Mesh or Opening (Inches)
Woven Wire, Expanded Metal or Perforated Metal	From 2 to 4 4 to 15	1/2 2
Wood or Metal Strips (Crossed)	From 2 to 4 4 to 15	3/8 2
Wood or Metal Strips (Not Crossed)	From 2 to 4 4 to 15	1/2 width of strip 1 width of strip

Note: The specifications for the materials used for filling barrier, point of operation guards is contained in Table O-12, WAC 296-24-20531. When plastic is used as filling, it shall be 1/4 inch thick (minimum).

(2) Point of operation guards.

(a) Every point of operation guard shall meet the following design, construction, application and adjustment requirements:

(i) It shall prevent entry of hands or fingers into the point of operation by reaching through, over, under or around the guard;

(ii) It shall conform to the maximum permissible openings of Table O-10;

(iii) It shall, in itself, create no pinch point between the guard and moving machine parts;

(iv) It shall utilize fasteners not readily removable by operator, so as to minimize the possibility of misuse or removal of essential parts;

(v) It shall facilitate its inspection, and

(vi) It shall offer maximum visibility of the point of operation consistent with other requirements.

(b) A die enclosure guard shall be attached to the die shoe or stripper in a fixed position.

(c) A fixed barrier guard shall be attached securely to the frame of the pressor to the bolster plate.

(d) An interlocked press barrier guard shall be attached to the press frame or bolster and shall be interlocked with the press clutch control so that the clutch cannot be activated unless the guard itself, or the hinged or movable sections of the guard are in position to conform to the requirements of Table O-10.

(e) The hinged or movable sections of an interlocked press barrier guard shall not be used for manual feeding. The guard shall prevent opening of the interlocked section and reaching into the point of operation prior to die closure or prior to the cessation of slide motion. See subsection (3)(b) of this section regarding manual feeding through interlocked press barrier devices.

(f) The adjustable barrier guard shall be securely attached to the press bed, bolster plate, or die shoe, and shall be adjusted and operated in conformity with Table O-10 and the requirements of this subsection. Adjustments shall be made only by authorized personnel whose qualifications include a knowledge of the provisions of Table O-10 and this subsection.

(g) A point of operation enclosure which does not meet the requirements of this subsection and Table O-10 shall be used only in conjunction with point of operation devices.

(3) Point of operation devices.

(a) Point of operation devices shall protect the operator by:

(i) Preventing and/or stopping normal stroking of the press if the operator's hands are inadvertently placed in the point of operation; or

(ii) Preventing the operator from inadvertently reaching into the point of operation or withdrawing his/her hands if they are inadvertently located in the point of operation, as the dies close; or

(iii) Preventing the operator from inadvertently reaching into the point of operation at all times; or

(iv) [Reserved.]

(v) Requiring application of both of the operator's hands to machine operating controls and locating such controls at such a safety distance from the point of operation that the slide completes the downward travel or stops before the operator can reach into the point of operation with his/her hands; or

(vi) Enclosing the point of operation before a press stroke can be initiated and maintaining this closed condition until the motion of the slide had ceased; or

(vii) Enclosing the point of operation before a press stroke can be initiated, so as to prevent an operator from reaching into the point of operation prior to die closure or prior to cessation of slide motion during the downward stroke.

(b) The gate or movable barrier device shall protect the operator as follows:

(i) A Type A gate or movable barrier device shall protect the operator in the manner specified in (a)(vi) of this subsection.

(ii) A Type B gate or movable barrier device shall protect the operator in the manner specified in (a)(vii) of this subsection.

(c) A presence sensing point of operation device shall protect the operator as provided in (a)(i) of this subsection, and shall be interlocked into the control circuit to prevent or stop slide motion if the operator's hand or other part of his/her body is within the sensing field of the device during the downstroke of the press slide.

(i) The device may not be used on machines using full revolution clutches.

(ii) The device may not be used as a tripping means to initiate slide motion, except when used in total conformance with WAC 296-24-19517.

(iii) The device shall be constructed so that a failure within the system does not prevent the normal stopping action from being applied to the press when required,

but does prevent the initiation of a successive stroke until the failure is corrected. The failure shall be indicated by the system.

(iv) Muting (bypassing of the protective function) of such device, during the upstroke of the press slide, is permitted for the purpose of parts ejection, circuit checking, and feeding.

(v) The safety distance (Ds) from the sensing field to the point of operation shall be greater than the distance determined by the following formula:

$$D_s = 63 \text{ inches/second} \times T_s \text{ where:}$$

$$D_s = \text{minimum safety distance (inches);}$$

$$63 \text{ inches/second} = \text{hand speed constant; and}$$

$$T_s = \text{stopping time of the press measured at approximately } 90^\circ \text{ position of crankshaft rotation (seconds).}$$

(vi) Guards shall be used to protect all areas of entry to the point of operation not protected by the presence sensing device.

(d) The pull-out device shall protect the operator as specified in (a)(ii) of this subsection and shall include attachments for each of the operator's hands.

(i) Attachments shall be connected to and operated only by the press slide or upper die.

(ii) Attachment shall be adjusted to prevent the operator from reaching into the point of operation or to withdraw the operator's hands from the point of operation before the dies close.

(iii) A separate pull-out device shall be provided for each operator if more than one operator is used on a press.

(iv) Each pull-out device in use shall be visually inspected and checked for proper adjustment at the start of each operator shift, following a new die set-up, and when operators are changed. Necessary maintenance or repair or both shall be performed and completed before the press is operated. Records of inspections and maintenance shall be kept in accordance with WAC 296-24-19511.

(e) The sweep device, shall protect the operator as specified in (a)(ii) of this subsection, by removing his/her hands safely to a safe position if they are inadvertently located in the point of operation, as the dies close or prior to tripping the clutch. Devices operating in this manner shall have a barrier, attached to the sweep arm in such a manner as to prevent the operator from reaching into the point of operation, past the trailing edge of the sweep arm on the downward stroke of the press. This device may not be used for point of operation safeguarding after December 31, 1976.

(i) The sweep device must be activated by the slide or by motion of a foot pedal triprod.

(ii) The sweep device must be designed, installed and operated so as to prevent the operator from reaching into the point of operation before the dies close.

(iii) The sweep device must be installed so that it will not itself create an impact or shear hazard between the sweep arm and the press tie rods, dies, or any other part of the press or barrier.

(iv) Partial enclosure conforming with (e) of this subsection, as to the area of entry which they protect, must be provided on both sides of the point of operation to prevent the operator from reaching around or behind the

sweep device and into the point of operation after the dies start to close. Partial enclosures shall not themselves create a pinch point or shear hazard.

(f) A holdout or a restraint device shall protect the operator as specified in (a)(iii) of this subsection and shall include attachments for each of the operator's hands. Such attachments shall be securely anchored and adjusted in such a way that the operator is restrained from reaching into the point of operation. A separate set of restraints shall be provided for each operator if more than one operator is required on a press.

(g) The two hand control device shall protect the operator as specified in (a)(v) of this subsection.

(i) When used in press operations requiring more than one operator, separate two hand controls shall be provided for each operator, and shall be designed to require concurrent application of all operators' controls to activate the slide. The removal of a hand from any control button shall cause the slide to stop.

(ii) Each two hand control shall meet the construction requirements of WAC 296-24-19505 (7)(e).

(iii) The safety distance (Ds) between each two hand control device and the point of operation shall be greater than the distance determined by the following formula:

$$D_s = 63 \text{ inches/second} \times T_s \text{, where:}$$

$$D_s = \text{minimum safety distance (inches);}$$

$$63 \text{ inches/second} = \text{hand speed constant; and}$$

$$T_s = \text{stopping time of the press measured at approximately } 90^\circ \text{ position of crankshaft rotation (seconds).}$$

(iv) Two hand control shall be fixed in position so that only a supervisor or safety engineer is capable of relocating the controls.

(h) The two hand trip device shall protect the operator as specified in (a)(v) of this subsection.

(i) When used in press operations requiring more than one operator, separate two hand trips shall be provided for each operator, and shall be designed to require concurrent application of all operators' controls to activate the slide.

(ii) Each two hand trip shall meet the construction requirements of WAC 296-24-19505(6).

(iii) The safety distance (Dm) between the two hand trip and the point of operation shall be greater than the distance determined by the following formula:

$$D_m = 63 \text{ inches/second} \times T_m \text{, where:}$$

$$D_m = \text{minimum safety distance (inches);}$$

$$63 \text{ inches/second} = \text{hand speed constant; and}$$

$$T_m = \text{the maximum time the press takes for the die closure after it has been tripped (seconds). For full revolution clutch presses with only one engaging point } T_m \text{ is equal to the time necessary for one and one-half revolutions of the crankshaft. For full revolution clutch presses with more than one engaging point, } T_m \text{ shall be calculated as follows:}$$

$$T_m = \left\{ \begin{array}{l} 1 \\ - + \\ 2 \end{array} \right. \frac{1}{\text{Number of engaging points per revolution}} \left. \right\} \times \text{time necessary to complete one revolution of the crankshaft (seconds)}$$

(iv) Two hand trips shall be fixed in position so that only a supervisor or safety engineer is capable of relocating the controls.

(i) [Reserved.]

(4) Hand feeding tools. Hand feeding tools are intended for placing and removing materials in and from the press. Hand feeding tools are not a point of operation guard or protection device and shall not be used in lieu of the "guards" or devices required in this section.

(5) Additional requirements for safeguarding. Where the operator feeds or removes parts by placing one or both hands in the point of operation, and a two hand control, presence sensing device of Type B gate or movable barrier (on a part revolution clutch) is used for safeguarding:

(i) The employer shall use a control system and a brake monitor which comply with WAC 296-24-19505 (13) and (14). This requirement shall be complied with by November 1, 1975;

(ii) The exception in WAC 296-24-19505 (7)(e)(iv) for two hand controls manufactured and installed before August 31, 1971, is not applicable under this subsection;

(iii) The control of air clutch machines shall be designed to prevent a significant increase in the normal stopping time due to a failure within the operating valve mechanism, and to inhibit further operation if such failure does occur, where a part revolution clutch is employed. The exception in WAC 296-24-19505 (7)(k) for controls manufactured and installed before August 31, 1971, is not applicable under this subsection.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-19507, filed 11/14/88. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-24-19507, filed 11/13/80; Order 76-6, § 296-24-19507, filed 3/1/76; Order 73-5, § 296-24-19507, filed 5/9/73 and Order 73-4, § 296-24-19507, filed 5/7/73.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear herein pursuant to the requirements of RCW 34.08.040.

WAC 296-24-19515 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-19517 Presence sensing device initiation (PSDI). (1) General.

(a) The requirements of this section shall apply to all part revolution mechanical power presses used in the PSDI mode of operation.

(b) The relevant requirements of WAC 296-24-19503 through 296-24-19515 of this part also shall apply to all presses used in the PSDI mode of operation, whether or not cross referenced in this section. Such cross-referencing of specific requirements from WAC 296-24-19503 through 296-24-19515 of this part is intended only to enhance convenience and understanding in relating to the new provisions to the existing standard, and is not to be construed as limiting the applicability of other provisions in WAC 296-24-19503 through 296-24-19515 of this part.

(c) Full revolution mechanical power presses shall not be used in the PSDI mode of operation.

(d) Mechanical power presses with a configuration which would allow a person to enter, pass through, and become clear of the sensing field into the hazardous portion of the press shall not be used in the PSDI mode of operation.

(e) The PSDI mode of operation shall be used only for normal production operations. Die-setting and maintenance procedures shall comply with WAC 296-24-19503 through 296-24-19515 of this part, and shall not be done in the PSDI mode.

(2) Brake and clutch requirements.

(a) Presses with flexible steel band brakes or with mechanical linkage actuated brakes or clutches shall not be used in the PSDI mode.

(b) Brake systems on presses used in the PSDI mode shall have sufficient torque so that each average value of stopping times (Ts) for stops initiated at approximately forty-five degrees, sixty degrees, and ninety degrees, respectively, of crankshaft angular position, shall not be more than one hundred twenty-five percent of the average value of the stopping time at the top crankshaft position. Compliance with this requirement shall be determined by using the heaviest upper die to be used on the press, and operating at the fastest press speed if there is speed selection.

(c) Where brake engagement and clutch release is effected by spring action, such spring(s) shall operate in compression on a rod or within a hole or tube, and shall be of noninterleaving design.

(3) Pneumatic systems.

(a) Air valve and air pressure supply/control.

(i) The requirements of WAC 296-24-19505 (7)(m) and (n), (10), (12) and WAC 296-24-19507 (5)(c) of this part apply to the pneumatic systems of machines used in the PSDI mode.

(ii) The air supply for pneumatic clutch/brake control valves shall incorporate a filter, an air regulator, and, when necessary for proper operation, a lubricator.

(iii) The air pressure supply for clutch/brake valves on machines used in the PSDI mode shall be regulated to pressures less than or equal to the air pressure used when making the stop time measurements required by subsection (2)(b) of this section.

(b) Air counterbalance systems.

(i) Where presses that have slide counterbalance systems are used in the PSDI mode, the counterbalance system shall also meet the requirements of WAC 296-24-19505(9) of this part.

(ii) Counterbalances shall be adjusted in accordance with the press manufacturer's recommendations to assure correct counterbalancing of the slide attachment (upper die) weight for all operations performed on presses used in the PSDI mode. The adjustments shall be made before performing the stopping time measurements required by subsections (2)(b), (5)(c), and (9)(f) of this section.

(4) Flywheels and bearings. Presses whose designs incorporate flywheels running on journals on the crankshaft or back shaft, or bull gears running on journals mounted on the crankshaft, shall be inspected, lubricated, and maintained as provided in subsection (10) of this section to reduce the possibility of unintended and uncontrolled press strokes caused by bearing seizure.

(5) Brake monitoring.

(a) Presses operated in the PSDI mode shall be equipped with a brake monitor that meets the requirements of subsections (3) and (14) of this section. In addition, the brake monitor shall be adjusted during installation certification to prevent successive stroking of the press if increases in stopping time cause an increase in the safety distance above that required by subsection (9)(f) of this section.

(b) Once the PSDI safety system has been certified/validated, adjustment of the brake monitor shall not be done without prior approval of the validation organization for both the brake monitor adjustment and the corresponding adjustment of the safety distance. The validation organization shall in its installation validation, state that in what circumstances, if any, the employer has advance approval for adjustment, when prior oral approval is appropriate and when prior approval must be in writing. The adjustment shall be done under the supervision of an authorized person whose qualifications include knowledge of safety distance requirements and experience with the brake system and its adjustment. When brake wear or other factors extend press stopping time beyond the limit permitted by the brake monitor, adjustment, repair, or maintenance shall be performed on the brake or other press system element that extends the stopping time.

(c) The brake monitor setting shall allow an increase of no more than ten percent of the longest stopping time for the press, or ten milliseconds, whichever is longer, measured at the top of the stroke.

(6) Cycle control and control systems.

(a) The control system on presses used in the PSDI mode shall meet the applicable requirements of WAC 296-24-19503 (7), (8), and (13) and 296-24-19507(5) of this part.

(b) The control system shall incorporate a means of dynamically monitoring for decoupling of the rotary position indicating mechanism drive from the crankshaft. This monitor shall stop slide motion and prevent successive press strokes if decoupling occurs, or if the monitor itself fails.

(c) The mode selection means of WAC 296-24-19503 (7)(c) of this part shall have at least one position for selection of the PSDI mode. Where more than one interruption of the light sensing field is used in the initiation of a stroke, either the mode selection means must have one position for each function, or a separate selection means shall be provided which becomes operable when the PSDI mode is selected. Selection of PSDI mode and the number of interruptions/withdrawals of the light sensing field required to initiate a press cycle shall be by means capable of supervision by the employer.

(d) A PSDI set-up/reset means shall be provided which requires an overt action by the operator, in addition to PSDI mode selection, before operation of the press by means of PSDI can be started.

(e) An indicator visible to the operator and readily seen by the employer shall be provided which shall clearly indicate that the system is set-up for cycling in the PSDI mode.

(f) The control system shall incorporate a timer to deactivate PSDI when the press does not stroke within the period of time set by the timer. The timer shall be manually adjustable, to a maximum time of thirty seconds. For any timer setting greater than fifteen seconds, the adjustment shall be made by the use of a special tool available only to authorized persons. Following a deactivation of PSDI by the timer, the system shall make it necessary to reset the set-up/reset means in order to reactivate the PSDI mode.

(g) Reactivation of PSDI operation following deactivation of the PSDI mode from any other cause, such as activation of the red color stop control required by WAC 296-24-19503 (7)(b) of this part, interruption of the presence sensing field, opening of an interlock, or reselection of the number of sensing field interruptions/withdrawals required to cycle the press, shall require resetting of the set-up/reset means.

(h) The control system shall incorporate an automatic means to prevent initiation or continued operation in the PSDI mode unless the press drive motor is energized in the forward direction of crankshaft rotation.

(i) The control design shall preclude any movement of the slide caused by operation of power on, power off, or selector switches, or from checks for proper operations as required by this subsection.

(j) All components and subsystems of the control system shall be designed to operate together to provide total control system compliance with the requirements of this section.

(k) Where there is more than one operator of a press used for PSDI, each operator shall be protected by a separate, independently functioning, presence sensing device. The control system shall require that each sensing field be interrupted the selected number of times prior to initiating a stroke. Further, each operator shall be provided with a set-up/reset means that meets the requirements of this subsection, and which must be actuated to initiate operation of the press in the PSDI mode.

(l) The control system shall incorporate interlocks for supplemental guards, if used, which will prevent stroke initiation or will stop a stroke in progress if any supplemental guard fails or is deactivated.

(m) The control system shall perform checks for proper operation of all cycle control logic element switches and contacts at least once each cycle. Control elements shall be checked for correct status after power "on" and before the initial PSDI stroke.

(n) The control system shall have provisions for an "inch" operating means meeting the requirements of WAC 296-24-19503 (7)(b) of this part. Die-setting shall not be done in the PSDI mode. Production shall not be done in the "inch" mode.

(o) The control system shall permit only a single stroke per initiation command.

(p) Controls with internally stored programs (e.g., mechanical, electro-mechanical, or electronic) shall meet the requirements of WAC 296-24-19505(13) of

this part, and shall default to a predetermined safe condition in the event of any single failure within the system. Programmable controllers which meet the requirements for controls with internally stored programs stated above shall be permitted only if all logic elements affecting the safety system and point of operation safety are internally stored and protected in such a manner that they cannot be altered or manipulated by the user to an unsafe condition.

(7) Environmental requirements. Control components shall be selected, constructed, and connected together in such a way as to withstand expected operational and environmental stresses, at least including those outlined in WAC 296-24-20700. Such stresses shall not so affect the control system as to cause unsafe operation.

(8) Safety system.

(a) Mechanical power presses used in the PSDI mode shall be operated under the control of a safety system which, in addition to meeting the applicable requirements of WAC 296-24-19505(13) and 296-24-19507(5) and other applicable provisions of this part, shall function such that a single failure or single operating error shall not cause injury to personnel from point of operation hazards.

(b) The safety system shall be designed, constructed, and arranged as an integral total system, including all elements of the press, the controls, the safeguarding and any required supplemental safeguarding, and their interfaces with the operator and that part of the environment which has effect on the protection against point of operation hazards.

(9) Safeguarding the point of operation.

(a) The point of operation of presses operated in the PSDI mode shall be safeguarded in accordance with the requirements of WAC 296-24-19507 of this part, except that the safety distance requirements of (f) of this subsection shall be used for PSDI operation.

(b) PSDI shall be implemented only by use of light curtain (photo-electric) presence sensing devices which meet the requirements of WAC 296-24-19507 (3)(c)(iii) of this part unless the requirements of (c) of this subsection have been met.

(c) Alternatives to photo-electric light curtains may be used for PSDI when the employer can demonstrate, through tests and analysis by the employer or the manufacturer, that the alternative is as safe as the photo-electric light curtain, that the alternative meets the conditions of this section, has the same long-term reliability as light curtains and can be integrated into the entire safety system as provided for in this section. Prior to use, both the employer and manufacturer must certify that these requirements and all the other applicable requirements of this section are met and these certifications must be validated by an OSHA-recognized third-party validation organization to meet these additional requirements and all the other applicable requirements of WAC 296-24-19503 through 296-24-19515 and 296-24-

20700 of this part. Three months prior to the operation of any alternative system, the employer must notify the OSHA Directorate of Safety Standards Programs of the name of the system to be installed, the manufacturer and the OSHA-recognized third-party validation organization immediately. Upon request, the employer must make available to that office all tests and analyses for OSHA review.

(d) Individual sensing fields of presence sensing devices used to initiate strokes in the PSDI mode shall cover only one side of the press.

(e) Light curtains used for PSDI operation shall have minimum object sensitivity not to exceed one and one-fourth inches (31.75 mm). Where light curtain object sensitivity is user-adjustable, either discretely or continuously, design features shall limit the minimum object sensitivity adjustment not to exceed one and one-fourth inches (31.75 mm). Blanking of the sensing field is not permitted.

(f) The safety distance (Ds) from the sensing field of the presence sensing device to the point of operation shall be greater than or equal to the distance determined by the formula:

$$Ds = Hs(Ts + Tp + Tr + 2Tm) + Dp$$

Where:

Ds = Minimum safety distance.

Hs = Hand speed constant of sixty-three inches per second (1.6 m/s).

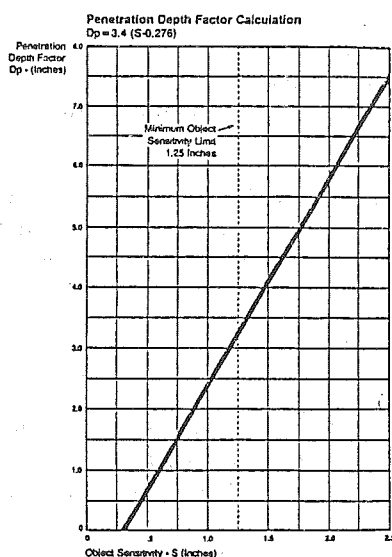
Ts = Longest press stopping time, in seconds, computed by taking averages of multiple measurements at each of three positions (forty-five degrees, sixty degrees, and ninety degrees) of crankshaft angular position; the longest of the three averages is the stopping time to use. (Ts is defined as the sum of the kinetic energy dissipation time plus the pneumatic/magnetic/hydraulic reaction time of the clutch/brake operating mechanism(s).)

Tp = Longest presence sensing device response time, in seconds.

Tr = Longest response time, in seconds, of all interposing control elements between the presence sensing device and the clutch/brake operating mechanism(s).

Tm = Increase in the press stopping time at the top of the stroke, in seconds, allowed by the brake monitor for brake wear. The time increase allowed shall be limited to no more than ten percent of the longest press stopping time measured at the top of the stroke, or ten milliseconds, whichever is longer.

Dp = Penetration depth factor, required to provide for possible penetration through the presence sensing field by fingers or hand before detection occurs. The penetration depth factor shall be determined from Graph A-1 using the minimum object sensitivity size.



(g) The presence sensing device location shall either be set at each tool change and set-up to provide at least the minimum safety distance, or fixed in location to provide a safety distance greater than or equal to the minimum safety distance for all tooling set-ups which are to be used on that press.

(h) Where presence sensing device location is adjustable, adjustment shall require the use of a special tool available only to authorized persons.

(i) Supplemental safeguarding shall be used to protect all areas of access to the point of operation which are unprotected by the PSDI presence sensing device. Such supplemental safeguarding shall consist of either additional light curtain (photo-electric) presence sensing devices or other types of guards which meet the requirements of WAC 296-24-19507 and 296-24-19515 of this part.

(A) Presence sensing devices used as supplemental safeguarding shall not initiate a press stroke, and shall conform to the requirements of WAC 296-24-19507 (3)(c) and other applicable provisions of this part, except that the safety distance shall comply with (f) of this subsection.

(B) Guards used as supplemental safeguarding shall conform to the design, construction and application requirements of WAC 296-24-19507(2) of this part, and shall be interlocked with the press control to prevent press PSDI operation if the guard fails, is removed, or is out of position.

(j) Barriers shall be fixed to the press frame or bolster to prevent personnel from passing completely through the sensing field, where safety distance or press configuration is such that personnel could pass through the PSDI presence sensing field and assume a position where the point of operation could be accessed without detection by the PSDI presence sensing device. As an alternative, supplemental presence sensing devices used only in the safeguard mode may be provided. If used, these

devices shall be located so as to detect all operator locations and positions not detected by the PSDI sensing field, and shall prevent stroking or stop a stroke in process when any supplemental sensing field(s) are interrupted.

(k) Hand tools. Where tools are used for feeding, removal of scrap, lubrication of parts, or removal of parts that stick on the die in PSDI operations:

(i) The minimum diameter of the tool handle extension shall be greater than the minimum object sensitivity of the presence sensing device(s) used to initiate press strokes; or

(ii) The length of the hand tool shall be such as to ensure that the operator's hand will be detected for any safety distance required by the press set-ups.

(10) Inspection and maintenance.

(a) Any press equipped with presence sensing devices for use in PSDI, or for supplemental safeguarding on presses used in the PSDI mode, shall be equipped with a test rod of diameter specified by the presence sensing device manufacturer to represent the minimum object sensitivity of the sensing field. Instructions for use of the test rod shall be noted on a label affixed to the presence sensing device.

(b) The following checks shall be made at the beginning of each shift and whenever a die change is made.

(i) A check shall be performed using the test rod according to the presence sensing device manufacturer's instructions to determine that the presence sensing device used for PSDI is operational.

(ii) The safety distance shall be checked for compliance with this section.

(iii) A check shall be made to determine that all supplemental safeguarding is in place. Where presence sensing devices are used for supplemental safeguarding, a check for proper operation shall be performed using a test rod according to the presence sensing device manufacturer's instructions.

(iv) A check shall be made to assure that the barriers and/or supplemental presence sensing devices required by this section are operating properly.

(v) A system or visual check shall be made to verify correct counterbalance adjustment for die weight according to the press manufacturer's instructions, when a press is equipped with a slide counterbalance system.

(c) When presses used in the PSDI mode have flywheel or bullgear running on crankshaft mounted journals and bearings, or a flywheel mounted on back shaft journals and bearings, periodic inspections following the press manufacturer's recommendations shall be made to ascertain that bearings are in good working order, and that automatic lubrication systems for these bearings (if automatic lubrication is provided) are supplying proper lubrication. On presses with provision for manual lubrication of flywheel or bullgear bearings, lubrication shall be provided according to the press manufacturer's recommendations.

(d) Periodic inspections of clutch and brake mechanisms shall be performed to assure they are in proper operating condition. The press manufacturer's recommendations shall be followed.

(e) When any check of the press, including those performed in accordance with the requirements of (b), (c), or (d) of this subsection, reveals a condition of noncompliance, improper adjustment, or failure, the press shall not be operated until the condition has been corrected by adjustment, replacement, or repair.

(f) It shall be the responsibility of the employer to ensure the competence of personnel caring for, inspecting, and maintaining power presses equipped for PSDI operation, through initial and periodic training.

(11) Safety system certification/validation.

(a) Prior to the initial use of any mechanical press in the PSDI mode, two sets of certification and validation are required:

(i) The design of the safety system required for the use of a press in the PSDI mode shall be certified and validated prior to installation. The manufacturer's certification shall be validated by an OSHA-recognized third-party validation organization to meet all applicable requirements of WAC 296-24-19503 through 296-24-19515 and 296-24-20700 of this part.

(ii) After a press has been equipped with a safety system whose design has been certified and validated in accordance with this section, the safety system installation shall be certified by the employer, and then shall be validated by an OSHA-recognized third-party validation organization to meet all applicable requirements of WAC 296-24-19503 through 296-24-19515 and 296-24-20700 of this part.

(b) At least annually thereafter, the safety system on a mechanical power press used in the PSDI mode shall be recertified by the employer and revalidated by an OSHA-recognized third-party validation organization to meet all applicable requirements of WAC 296-24-19503 through 296-24-19515 and 296-24-20700 of this part. Any press whose safety system has not been recertified and revalidated within the preceding twelve months shall be removed from service in the PSDI mode until the safety system is recertified and revalidated.

(c) A label shall be affixed to the press as part of each installation certification/validation and the most recent recertification/revalidation. The label shall indicate the press serial number, the minimum safety distance (Ds) required by subsection (9)(f) of this section, the fulfillment of design certification/validation, the employer's signed certification, the identification of the OSHA-recognized third-party validation organization, its signed validation, and the date the certification/validation and recertification/revalidation are issued.

(d) Records of the installation certification and validation and the most recent recertification and revalidation shall be maintained for each safety system equipped press by the employer as long as the press is in use. The records shall include the manufacture and model number of each component and subsystem, the calculations of the safety distance as required by subsection (9)(f) of this section, and the stopping time measurements required by subsection (2)(b) of this section. The most recent records shall be made available to OSHA upon request.

(e) The employer shall notify the OSHA-recognized third-party validation organization within five days whenever a component or a subsystem of the safety system fails or modifications are made which may affect the safety of the system. The failure of a critical component shall necessitate the removal of the safety system from service until it is recertified and revalidated, except recertification by the employer without revalidation is permitted when a noncritical component or subsystem is replaced by one of the same manufacture and design as the original, or determined by the third-party validation organization to be equivalent by similarity analysis, as set forth in WAC 296-24-20700.

(f) The employer shall notify the OSHA-recognized third-party validation organization within five days of the occurrence of any point of operation injury while a press is used in the PSDI mode. This is in addition to the report of injury required by WAC 296-24-19515 of this part; however, a copy of that report may be used for this purpose.

(12) Die setting and work set-up.

(a) Die setting on presses used in the PSDI mode shall be performed in accordance with WAC 296-24-19509.

(b) The PSDI mode shall not be used for die setting or set-up. An alternative manual cycle initiation and control means shall be supplied for use in die setting which meets the requirements of WAC 296-24-19505(7).

(c) Following a die change, the safety distance, the proper application of supplemental safeguarding, and the slide counterbalance adjustment (if the press is equipped with a counterbalance) shall be checked and maintained by authorized persons whose qualifications include knowledge of the safety distance, supplemental safeguarding requirements, and the manufacturer's specifications for counterbalance adjustment. Adjustment of the location of the PSDI presence sensing device shall require use of a special tool available only to the authorized persons.

(13) Operator training.

(a) The operator training required by WAC 296-24-19513(2) shall be provided to the employee before the employee initially operates the press and as needed to maintain competence, but not less than annually thereafter. It shall include instruction relative to the following items for presses used in the PSDI mode.

(i) The manufacturer's recommended test procedures for checking operation of the presence sensing device. This shall include the use of the test rod required by subsection (10)(a) of this section.

(ii) The safety distance required.

(iii) The operation, function, and performance of the PSDI mode.

(iv) The requirements for handtools that may be used in the PSDI mode.

(v) The severe consequences that can result if the operator attempts to circumvent or by-pass any of the safeguard or operating functions of the PSDI system.

(b) The employer shall certify that employees have been trained by preparing a certification record which includes the identity of the person trained, the signature

of the employer or the person who conducted the training, and the date the training was completed. The certification record shall be prepared at the completion of training and shall be maintained on file for the duration of the employee's employment. The certification record shall be made available upon request to the Assistant Secretary for Occupational Safety and Health.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-19517, filed 11/14/88.]

WAC 296-24-20699 Appendices A through D are added to Part C of chapter 296-24 WAC, to describe the federal procedures for third-party validation and certification of presence sensing devices on mechanical power presses.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-20699, filed 11/14/88.]

WAC 296-24-20700 Appendix A to WAC 296-24-195. Mandatory requirements for certification/validation of safety systems for presence sensing device initiation of mechanical power presses.

(1) Purpose. The purpose of the certification/validation of safety systems for presence sensing device initiation (PSDI) of mechanical power presses is to ensure that the safety systems are designed, installed, and maintained in accordance with all applicable requirements of WAC 296-24-19503 through 296-24-19517 and this Appendix A.

(2) General.

(a) The certification/validation process shall utilize an independent third-party validation organization recognized by OSHA in accordance with the requirements specified in WAC 296-24-20720 Appendix C.

(b) While the employer is responsible for assuring that the certification/validation requirements in WAC 296-24-19517(11) are fulfilled, the design certification of PSDI safety systems may be initiated by manufacturers, employers, and/or their representatives. The term "manufacturers" refers to the manufacturer of any of the components of the safety system. An employer who assembles a PSDI safety system would be a manufacturer as well as employer for purposes of this standard and Appendix.

(c) The certification/validation process includes two stages. For design certification, in the first stage, the manufacturer (which can be an employer) certifies that the PSDI safety system meets the requirements of WAC 296-24-19503 through 296-24-19517 and this Appendix A, based on appropriate design criteria and tests. In the second stage, the OSHA-recognized third-party validation organization validates that the PSDI safety system meets the requirements of WAC 296-24-19503 through 296-24-19517 and this Appendix A and the manufacturer's certification by reviewing the manufacturer's design and test data and performing any additional reviews required by this standard or which it believes appropriate.

(d) For installation certification/validation and annual recertification/revalidation, in the first stage the

employer certifies or recertifies that the employer is installing or utilizing a PSDI safety system validated as meeting the design requirements of WAC 296-24-19503 through 296-24-19517 and this Appendix A by an OSHA-recognized third-party validation organization and that the installation, operation and maintenance meet the requirements of WAC 296-24-19503 through 296-24-19517 and this Appendix A. In the second stage, the OSHA-recognized third-party validation organization validates or revalidates that the PSDI safety system installation meets the requirements of WAC 296-24-19503 through 296-24-19517 and this Appendix A and the employer's certification, by reviewing that the PSDI safety system has been certified; the employer's certification, designs and tests, if any; the installation, operation, maintenance and training; and by performing any additional tests and reviews which the validation organization believes is necessary.

(3) Summary. The certification/validation of safety systems of PSDI shall consider the press, controls, safeguards, operator, and environment as an integrated system which shall comply with all of the requirements in WAC 296-24-19503 through 296-24-19517 and this Appendix A. The certification/validation process shall verify that the safety system complies with the OSHA safety requirements as follows:

(a) Design certification/validation.

(i) The major parts, components, and subsystems used shall be defined by part number or serial number, as appropriate, and by manufacturer to establish the configuration of the system.

(ii) The identified parts, components, and subsystems shall be certified by the manufacturer to be able to withstand the functional and operational environments of the PSDI safety system.

(iii) The total system design shall be certified by the manufacturer as complying with all requirements in WAC 296-24-19503 through 296-24-19517 and this Appendix A.

(iv) The third-party validation organization shall validate the manufacturer's certification under (a)(i) and (ii) of this subsection.

(b) Installation certification/validation.

(i) The employer shall certify that the PSDI safety system has been design certified and validated, that the installation meets the operational and environmental requirements specified by the manufacturer, that the installation drawings are accurate, and that the installation meets the requirements of WAC 296-24-19503 through 296-24-19517 and this Appendix A. (The operational and installation requirements of the PSDI safety system may vary for different applications.)

(ii) The third-party validation organization shall validate the employer's certifications that the PSDI safety system is design certified and validated, that the installation meets the installation and environmental requirements specified by the manufacturer, and that the installation meets the requirements of WAC 296-24-19503 through 296-24-19517 and this Appendix A.

(c) Recertification/revalidation.

(i) The PSDI safety system shall remain under certification/validation for the shorter of one year or until the system hardware is changed, modified or refurbished, or operating conditions are changed (including environmental, application or facility changes), or a failure of a critical component has occurred.

(ii) Annually, or after a change specified in (c)(i) of this subsection, the employer shall inspect and recertify the installation as meeting the requirements set forth under subsection (3)(b) of this section, Installation certification/validation.

(iii) The third-party validation organization, annually or after a change specified in (c)(i) of this subsection, shall validate the employer's certification that the requirements of subsection (b) of this section, Installation certification/validation have been met.

Note: Such changes in operational conditions as die changes of press relocations not involving disassembly or revision to the safety system would not require recertification/revalidation.

(4) Certification/validation requirements.

(a) General design certification/validation requirements.

(i) Certification/validation program requirements. The manufacturer shall certify and the OSHA-recognized third-party validation organization shall validate that:

(A) The design of components, subsystems, software, and assemblies meets OSHA performance requirements and are ready for the intended use; and

(B) The performance of combined subsystems meets OSHA's operational requirements.

(ii) Certification/validation program level of risk evaluation requirements. The manufacturer shall evaluate and certify, and the OSHA-recognized third-party validation organization shall validate, the design and operation of the safety system by determining conformance with the following:

(A) The safety system shall have the ability to sustain a single failure or a single operating error and not cause injury to personnel from point of operation hazards. Acceptable design features shall demonstrate, in the following order or precedence, that:

(I) No single failure points may cause injury; or

(II) Redundancy, and comparison and/or diagnostic checking, exist for the critical items that may cause injury, and the electrical, electronic, electromechanical and mechanical parts and components are selected so that they can withstand operational and external environments. The safety factor and/or derated percentage shall be specifically noted and complied with.

(B) The manufacturer shall design, evaluate, test and certify, and the third-party validation organization shall evaluate and validate, that the PSDI safety system meets appropriate requirements in the following areas.

(I) Environmental limits

- Temperature
- Relative humidity
- Vibration
- Fluid compatibility with other materials

(II) Design limits

- Power requirements
- Power transient tolerances
- Compatibility of materials used
- Material stress tolerances and limits
- Stability to long term power fluctuations
- Sensitivity to signal acquisition
- Repeatability of measured parameter without inadvertent initiation of a press stroke
- Operational life of components in cycles, hours, or both

- Electromagnetic tolerance to:

- Specific operational wave lengths; and
- Externally generated wave lengths
- New design certification/validation. Design certification/validation for a new safety system, i.e., a new design or new integration of specifically identified components and subsystems, would entail a single certification/validation which would be applicable to all identical safety systems. It would not be necessary to repeat the tests on individual safety systems of the same manufacture or design. Nor would it be necessary to repeat these tests in the case of modifications where determined by the manufacturer and validated by the third-party validation organization to be equivalent by similarity analysis. Minor modifications not affecting the safety of the system may be made by the manufacturer without revalidation.

(III) Substantial modifications would require testing as a new safety system, as deemed necessary by the validation organization.

(b) Additional detailed design certification/validation requirements.

(i) General. The manufacturer or the manufacturer's representative shall certify to and submit to an OSHA-recognized third-party validation organization the documentation necessary to demonstrate that the PSDI safety system design is in full compliance with the requirements of WAC 296-24-19503 through 296-24-19517 and this Appendix A, as applicable, by means of analysis, tests, or combination of both, establishing that the following additional certification/validation requirements are fulfilled.

(ii) Reaction times. For the purpose of demonstrating compliance with the reaction time required by WAC 296-24-19517, the tests shall use the following definitions and requirements:

(A) "Reaction time" means the time, in seconds, it takes the signal, required to activate/deactivate the system, to travel through the system, measured from the time of signal initiation to the time the function being measured is completed.

(B) "Full stop" or "no movement of the slide or ram" means when the crankshaft rotation has slowed to two or less revolutions per minute, just before stopping completely.

(C) "Function completion" means for, electrical, electromechanical and electronic devices, when the circuit produces a change of state in the output element of the device.

(D) When the change of state is motion, the measurement shall be made at the completion of the motion.

(E) The generation of the test signal introduced into the system for measuring reaction time shall be such that the initiation time can be established with an error of less than 0.5 percent of the reaction time measured.

(F) The instrument used to measure reaction time shall be calibrated to be accurate to within 0.001 second.

(iii) Compliance with WAC 296-24-19517 (2)(b).

(A) For compliance with these requirements, the average value of the stopping time, T_s , shall be the arithmetic mean of at least twenty-five stops for each stop angle initiation measured with the brake and/or clutch unused, fifty percent worn, and ninety percent worn. The recommendations of the brake system manufacturer shall be used to simulate or estimate the brake wear. The manufacturer's recommended minimum lining depth shall be identified and documented, and an evaluation made that the minimum depth will not be exceeded before the next (annual) recertification/revalidation. A correlation of the brake and/or clutch degradation based on the above tests and/or estimates shall be made and documented. The results shall document the conditions under which the brake and/or clutch will and will not comply with the requirement. Based upon this determination, a scale shall be developed to indicate the allowable ten percent of the stopping time at the top of the stroke for slide or ram overtravel due to brake wear. The scale shall be marked to indicate that brake adjustment and/or replacement is required. The explanation and use of the scale shall be documented.

(B) The test specification and procedure shall be submitted to the validation organization for review and validation prior to the test. The validation organization representative shall witness at least one set of tests.

(iv) Compliance with WAC 296-24-19517 (5)(c) and (9)(f). Each reaction time required to calculate the safety distance, including the brake monitor setting, shall be documented in separate reaction time tests. These tests shall specify the acceptable tolerance band sufficient to assure that tolerance build-up will not render the safety distance unsafe.

(I) Integrated test of the press fully equipped to operate in the PSDI mode shall be conducted to establish the total system reaction time.

(II) Brakes which are the adjustable type shall be adjusted properly before the test.

(v) Compliance with WAC 296-24-19517 (2)(c).

(A) Prior to conducting the brake system test required by WAC 296-24-19517 (2)(b), a visual check shall be made of the springs. The visual check shall include a determination that the spring housing or rod does not show damage sufficient to degrade the structural integrity of the unit, and the spring does not show any tendency to interleave.

(B) Any detected broken or unserviceable springs shall be replaced before the test is conducted. The test shall be considered successful if the stopping time remains within that which is determined by WAC 296-24-19517 (9)(f) for the safety distance setting. If the increase in press stopping time exceeds the brake monitor setting limit defined in WAC 296-24-19517 (5)(c),

the test shall be considered unsuccessful, and the cause of the excessive stopping time shall be investigated. It shall be ascertained that the springs have not been broken and that they are functioning properly.

(vi) Compliance with WAC 296-24-19517(7).

(A) Tests which are conducted by the manufacturers of electrical components to establish stress, life, temperature and loading limits must be tests which are in compliance with the provisions of the National Electrical Code.

(B) Electrical and/or electronic cards or boards assembled with discreet components shall be considered a subsystem and shall require separate testing that the subsystems do not degrade in any of the following conditions:

(I) Ambient temperature variation from -20°C to $+50^{\circ}\text{C}$.

(II) Ambient relative humidity of ninety-nine percent.

(III) Vibration of 45G for one millisecond per stroke when the item is to be mounted on the press frame.

(IV) Electromagnetic interference at the same wavelengths used for the radiation sensing field, at the power line frequency fundamental and harmonics, and also from autogenous radiation due to system switching.

(V) Electrical power supply variations of NZ15 percent.

(C) The manufacturer shall specify the test requirements and procedures from existing consensus tests in compliance with the provisions of the National Electrical Code.

(D) Tests designed by the manufacturer shall be made available upon request to the validation organization. The validation organization representative shall witness at least one set of each of these tests.

(vii) Compliance with WAC 296-24-19517 (9)(d).

(A) The manufacturer shall design a test to demonstrate that the prescribed minimum object sensitivity of the presence sensing device is met.

(B) The test specifications and procedures shall be made available upon request to the validation organization.

(viii) Compliance with WAC 296-24-19517 (9)(k).

(A) The manufacturer shall design a test(s) to establish the hand tool extension diameter allowed for variations in minimum object sensitivity response.

(B) The test(s) shall document the range of object diameter sizes which will produce both single and double break conditions.

(C) The test(s) specifications and procedures shall be made available upon request to the validation organization.

(ix) Integrated tests certification/validation.

(A) The manufacturer shall design a set of integrated tests to demonstrate compliance with the following requirements:

WAC 296-24-19517 (6)(b), (c), (d), (e), (f), (g), (h), (i), (j), (k), (l), (m), (n), and (o).

(B) The integrated test specifications and procedures shall be made available to the validation organization.

(x) Analysis. The manufacturer shall submit to the validation organization the technical analysis such as

hazard analysis, failure mode and effect analysis, stress analysis, component and material selection analysis, fluid compatibility, and/or other analyses which may be necessary to demonstrate compliance with the following requirements:

WAC 296-24-19517 (8)(a) and (b); (2)(b) and (c); (3)(a)(i) and (iv) and (b); (5)(a), (b) and (c); (6)(a), (c), (d), (f), (g), (h), (i), (j), (k), (l), (m), (n), (o), and (p); (7)(a) and (b); (9)(d), (f), (i), (j) and (k); (10)(a) and (b).

(xi) Types of tests acceptable for certification/validation.

(A) Test results obtained from development testing may be used to certify/validate the design.

(B) The test results shall provide the engineering data necessary to establish confidence that the hardware and software will meet specifications, the manufacturing process has adequate quality control and the data acquired was used to establish processes, procedures, and test levels supporting subsequent hardware design, production, installation and maintenance.

(xii) Validation for design certification/validation. If, after review of all documentation, tests, analyses, manufacturer's certifications, and any additional tests which the third-party validation organization believes are necessary, the third-party validation organization determines that the PSDI safety system is in full compliance with the applicable requirements of WAC 296-24-19503 through 296-24-19517 and this Appendix A, it shall validate the manufacturer's certification that it so meets the stated requirements.

(c) Installation certification/validation requirements.

(i) The employer shall evaluate and test the PSDI system installation, shall submit to the OSHA-recognized third-party validation organization the necessary supporting documentation, and shall certify that the requirements of WAC 296-24-19503 through 296-24-19517 and this Appendix A have been met and that the installation is proper.

(ii) The OSHA-recognized third-party validation organization shall conduct tests, and/or review and evaluate the employer's installation tests, documentation and representations. If it so determines, it shall validate the employer's certification that the PSDI safety system is in full conformance with all requirements of WAC 296-24-19503 through 296-24-19517 and this Appendix A.

(d) Recertification/revalidation requirements.

(i) A PSDI safety system which has received installation certification/validation shall undergo recertification/revalidation the earlier of:

(A) Each time the systems hardware is significantly changed, modified, or refurbished;

(B) Each time the operational conditions are significantly changed (including environmental, application or facility changes, but excluding such changes as die changes or press relocations not involving revision to the safety system);

(C) When a failure of a significant component has occurred or a change has been made which may affect safety; or

(D) When one year has elapsed since the installation certification/validation or the last recertification/revalidation.

(ii) Conduct or recertification/revalidation. The employer shall evaluate and test the PSDI safety system installation, shall submit to the OSHA-recognized third-party validation organization the necessary supporting documentation, and shall recertify that the requirements of WAC 296-24-19503 through 296-24-19517 and this Appendix A are being met. The documentation shall include, but not be limited to, the following items:

(A) Demonstration of a thorough inspection of the entire press and PSDI safety system to ascertain that the installation, components and safeguarding have not been changed, modified or tampered with since the installation certification/validation or last recertification/revalidation was made.

(B) Demonstrations that such adjustments as may be needed (such as to the brake monitor setting) have been accomplished with proper changes made in the records and on such notices as are located on the press and safety system.

(C) Demonstration that review has been made of the reports covering the design certification/validation, the installation certification/validation, and all recertification/revalidation, in order to detect any degradation to an unsafe condition, and that necessary changes have been made to restore the safety system to previous certification/validation levels.

(iii) The OSHA-recognized third-party validation organization shall conduct tests, and/or review and evaluate the employer's installation, tests, documentation and representations. If it so determines, it shall revalidate the employer's recertification that the PSDI system is in full conformance with all requirements of WAC 296-24-19503 through 296-24-19517 and this Appendix A.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-20700, filed 11/14/88.]

WAC 296-24-20710 Appendix B to WAC 296-24-195. Nonmandatory guidelines for certification/validation of safety systems for presence sensing device initiation of mechanical power presses.

(1) Objectives. This Appendix provides employers, manufacturers, and their representatives, with nonmandatory guidelines for use in developing certification documents. Employers and manufacturers are encouraged to recommend other approaches if there is a potential for improving safety and reducing cost. The guidelines apply to certification/validation activity from design evaluation through the completion of the installation test and the annual recertification/revalidation tests.

(2) General guidelines.

(a) The certification/validation process should confirm that hazards identified by hazard analysis, (HA), failure mode effect analyses (FMEA), and other system analyses have been eliminated by design or reduced to an acceptable level through the use of appropriate design features, safety devices, warning devices, or special procedures. The certification/validation process should also

confirm that residual hazards identified by operational analysis are addressed by warning, labeling safety instructions or other appropriate means.

(b) The objective of the certification/validation program is to demonstrate and document that the system satisfies specification and operational requirements for safe operations.

(3) Quality control. The safety attributes of a certified/validated PSDI safety system are more likely to be maintained if the quality of the system and its parts, components and subsystem is consistently controlled. Each manufacturer supplying parts, components, subsystems, and assemblies needs to maintain the quality of the product, and each employer needs to maintain the system in a nondegraded condition.

(4) Analysis guidelines.

(a) Certification/validation of hardware design below the system level should be accomplished by test and/or analysis.

(b) Analytical methods may be used in lieu of, in combination with, or in support of tests to satisfy specification requirements.

(c) Analyses may be used for certification/validation when existing data are available or when test is not feasible.

(d) Similarity analysis may be used in lieu of tests where it can be shown that the article is similar in design, manufacturing process, and quality control to another article that was previously certified/validated in accordance with equivalent or more stringent criteria. If previous design, history and application are considered to be similar, but not equal to or more exacting than earlier experiences, the additional or partial certification/validation tests should concentrate on the areas of changed or increased requirements.

(5) Analysis reports.

(a) The analysis reports should identify:

- (i) The basis for the analysis;
- (ii) The hardware or software items analyzed;
- (iii) Conclusions;
- (iv) Safety factors; and
- (v) Limit of the analysis.

The assumptions made during the analysis should be clearly stated and a description of the effects of these assumptions on the conclusions and limits should be included.

(b) Certification/validation by similarity analysis reports should identify, in addition to the above, application of the part, component or subsystem for which certification/validation is being sought as well as data from previous usage establishing adequacy of the item. Similarity analysis should not be accepted when the internal and external stresses on the item being certified/validated are not defined.

(c) Usage experience should also include failure data supporting adequacy of the design.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-20710, filed 11/14/88.]

WAC 296-24-20720 Appendix C to WAC 296-24-195. Mandatory requirements for OSHA recognition of

third-party validation organizations for the PSDI standard.

(1) This Appendix prescribes mandatory requirements and procedures for OSHA recognition of third-party validation organizations to validate employer and manufacturer certifications that their equipment and practices meet the requirements of the PSDI standard. The scope of the Appendix includes the three categories of certification/validation required by the PSDI standard: Design certification/validation, installation certification/validation, and annual recertification/revalidation. If further detailing of these provisions will assist the validation organization or OSHA in this activity, this detailing will be done through appropriate OSHA program directives.

(2) Procedure for OSHA recognition of validation organizations.

(a) Applications.

(i) Eligibility.

(A) Any person or organization considering itself capable of conducting a PSDI-related third-party validation function may apply for OSHA recognition.

(B) However, in determining eligibility for a foreign-based third-party validation organization, OSHA shall take into consideration whether there is reciprocity of treatment by the foreign government after consultation with relevant United States government agencies.

(ii) Content of application.

(A) The application shall identify the scope of the validation activity for which the applicant wishes to be recognized, based on one of the following alternatives:

(I) Design certification/validation, installation certification/validation, and annual recertification/revalidation;

(II) Design certification/validation only; or

(III) Installation/certification/validation and annual recertification/revalidation.

(B) The application shall provide information demonstrating that it and any validating laboratory utilized meet the qualifications set forth in subsection (3) of this section.

(C) The applicant shall provide information demonstrating that it and any validating laboratory utilized meet the program requirements set forth in subsection (4) of this section.

(D) The applicant shall identify the test methods it or the validating laboratory will use to test or judge the components and operations of the PSDI safety system required to be tested by the PSDI standard and WAC 296-24-20700, Appendix A, and shall specify the reasons the test methods are appropriate.

(E) The applicant may include whatever enclosures, attachments, or exhibits the applicant deems appropriate. The application need not be submitted on a federal form.

(F) The applicant shall certify that the information submitted is accurate.

(iii) Filing office location. The application shall be filed with: PSDI Certification/Validation Program, Office of Variance Determination, Occupational Safety and Health Administration, U.S. Department of Labor,

Room N3653, 200 Constitution Avenue, N.W., Washington, DC 20210.

(iv) Amendments and withdrawals.

(A) An application may be revised by an applicant at any time prior to the completion of the final staff recommendation.

(B) An application may be withdrawn by an applicant, without prejudice, at any time prior to the final decision by the assistant secretary in (b)(viii)(B)(IV) of this subsection.

(b) Review and decision process.

(i) Acceptance and field inspection. All applications submitted will be accepted by OSHA, and their receipt acknowledged in writing. After receipt of an application, OSHA may request additional information if it believes information relevant to the requirements for recognition have been omitted. OSHA may inspect the facilities of the third-party validation organization and any validating laboratory, and while there shall review any additional documentation underlying the application. A report shall be made of each field inspection.

(ii) Requirements for recognition. The requirements for OSHA recognition of a third-party validation organization for the PSDI standard are that the program has fulfilled the requirements of subsection (3) of this section for qualifications and of subsection (4) of this section for program requirements, and the program has identified appropriate test and analysis methods to meet the requirements of the PSDI standard and WAC 296-24-20700, Appendix A.

(iii) Preliminary approval. If, after review of the application, any additional information, and the inspection report, the applicant and any validating laboratory appear to have met the requirements for recognition, a written recommendation shall be submitted by the responsible OSHA personnel to the assistant secretary to approve the application with a supporting explanation.

(iv) Preliminary disapproval. If, after review of the application, additional information, and inspection report, the applicant does not appear to have met the requirements for recognition, the director of the PSDI certification/validation program shall notify the applicant in writing, listing the specific requirements of this Appendix which the applicant has not met, and the reasons.

(v) Revision of application. After receipt of a notification of preliminary disapproval, the applicant may submit a revised application for further review by OSHA pursuant to (b) of this subsection or may request that the original application be submitted to the assistant secretary with a statement of reasons supplied by the applicant as to why the application should be approved.

(vi) Preliminary decision by assistant secretary.

(A) The assistant secretary, or a special designee for this purpose, will make a preliminary decision whether the applicant has met the requirements for recognition based on the completed application file and the written staff recommendation, as well as the statement of reasons by the applicant if there is a recommendation of disapproval.

(B) This preliminary decision will be sent to the applicant and subsequently published in the federal register.

(vii) Public review and comment period.

(A) The federal register notice of preliminary decision will provide a period of not less than sixty calendar days for the written comments on the applicant's fulfillment of the requirements for recognition. The application, supporting documents, staff recommendation, statement of applicant's reasons, and any comments received, will be available for public inspection in the OSHA docket office.

(B) If the preliminary decision is in favor of recognition, a member of the public, or if the preliminary decision is against recognition, the applicant may request a public hearing by the close of the comment period, if it supplies detailed reasons and evidence challenging the basis of the assistant secretary's preliminary decision and justifying the need for a public hearing to bring out evidence which could not be effectively supplied through written submissions.

(viii) Final decision by assistant secretary.

(A) Without hearing. If there are no valid requests for a hearing, based on the application, supporting documents, staff recommendation, evidence and public comment, the assistant secretary shall issue the final decision (including reasons) of the Department of Labor on whether the applicant has demonstrated by a preponderance of the evidence that it meets the requirements for recognition.

(B) After hearing. If there is a valid request for a hearing pursuant to (b)(vii)(B) of this subsection, the following procedures will be used:

(I) The assistant secretary will issue a notice of hearing before an administrative law judge of the Department of Labor pursuant to the rules specified in 29 CFR Part 1905, Subpart C.

(II) After the hearing, pursuant to Subpart C, the administrative law judge shall issue a decision (including reasons) based on the application, the supporting documentation, the staff recommendation, the public comments and the evidence submitted during the hearing (the record), stating whether it has been demonstrated, based on a preponderance of evidence, that the applicant meets the requirements for recognition. If no exceptions are filed, this is the final decision of the Department of Labor.

(III) Upon issuance of the decision, any party to the hearing may file exceptions within twenty days pursuant to Subpart C. If exceptions are filed, the administrative law judge shall forward the decision, exceptions and record to the assistant secretary for the final decision on the application.

(IV) The assistant secretary shall review the record, the decision by the administrative law judge, and the exceptions. Based on this, the assistant secretary shall issue the final decision (including reasons) of the Department of Labor stating whether the applicant has demonstrated by a preponderance of evidence that it meets the requirements for recognition.

(ix) Publication. A notification of the final decision shall be published in the federal register.

(c) Terms and conditions of recognition, renewal and revocation.

(i) The following terms and conditions shall be part of every recognition:

(A) The recognition of any validation organization will be evidenced by a letter of recognition from OSHA. The letter will provide the specific details of the scope of the OSHA recognition as well as any conditions imposed by OSHA, including any federal monitoring requirements.

(B) The recognition of each validation organization will be valid for five years, unless terminated before or renewed after the expiration of the period. The dates of the period of recognition will be stated in the recognition letter.

(C) The recognized validation organization shall continue to satisfy all the requirements of this Appendix and the letter of recognition during the period of recognition.

(ii) A recognized validation organization may change a test method of the PSDI safety system certification/validation program by notifying the assistant secretary of the change, certifying that the revised method will be at least as effective as the prior method, and providing the supporting data upon which its conclusions are based.

(iii) A recognized validation organization may renew its recognition by filing a renewal request at the address in (a)(iii) of this subsection, not less than one hundred eighty calendar days, nor more than one year, before the expiration date of its current recognition. When a recognized validation organization has filed such a renewal request, its current recognition will not expire until a final decision has been made on the request. The renewal request will be processed in accordance with (b) of this subsection, except that a reinspection is not required but may be performed by OSHA. A hearing will be granted to an objecting member of the public if evidence of failure to meet the requirements of this Appendix is supplied to OSHA.

(iv) A recognized validation organization may apply to OSHA for an expansion of its current recognition to cover other categories of PSDI certification/validation in addition to those included in the current recognition. The application for expansion will be acted upon and processed by OSHA in accordance with (b) of this subsection, subject to the possible reinspection exception. If the validation organization has been recognized for more than one year, meets the requirements for expansion of recognition, and there is no evidence that the recognized validation organization has not been following the requirements of this Appendix and the letter of recognition, an expansion will normally be granted. A hearing will be granted to an objecting member of the public only if evidence of failure to meet the requirements of this Appendix is supplied to OSHA.

(v) A recognized validation organization may voluntarily terminate its recognition, either in its entirety or

with respect to any area covered in its recognition, by giving written notice to OSHA at any time. The written notice shall indicate the termination date. A validation organization may not terminate its installation certification and recertification validation functions earlier than either one year from the date of the written notice, or the date on which another recognized validation organization is able to perform the validation of installation certification and recertification.

(vi) OSHA may revoke its recognition of a validation organization if its program either has failed to continue to satisfy the requirements of this Appendix or its letter of recognition, has not been performing the validation functions required by the PSDI standard and WAC 296-24-20700, Appendix A, or has misrepresented itself in its applications. Before proposing to revoke recognition, the agency will notify the recognized validation organization of the basis of the proposed revocation and will allow rebuttal or correction of the alleged deficiencies. If the deficiencies are not corrected, OSHA may revoke recognition, effective in sixty days, unless the validation organization requests a hearing within that time.

(vii) If a hearing is requested, it shall be held before an administrative law judge of the Department of Labor pursuant to the rules specified in 29 CFR Part 1905, Subpart C.

(viii) The parties shall be OSHA and the recognized validation organization. The decision shall be made pursuant to the procedures specified in (b)(viii)(B)(II) through (IV) of this subsection except that the burden of proof shall be on OSHA to demonstrate by a preponderance of the evidence that the recognition should be revoked because the validation organization either is not meeting the requirements for recognition, has not been performing the validation functions required by the PSDI standard and WAC 296-24-20700, Appendix A, or has misrepresented itself in its applications.

(d) Provisions of OSHA recognition. Each recognized third-party validation organization and its validating laboratories shall:

(i) Allow OSHA to conduct unscheduled reviews or on-site audits of it or the validating laboratories on matters relevant to PSDI, and cooperate in the conduct of these reviews and audits;

(ii) Agree to terms and conditions established by OSHA in the grant of recognition on matters such as exchange of data, submission of accident reports, and assistance in studies for improving PSDI or the certification/validation process.

(3) Qualifications. The third-party validation organization, the validating laboratory, and the employees of each shall meet the requirements set forth in this section of this Appendix.

(a) Experience of validation organization.

(i) The third-party validation organization shall have legal authority to perform certification/validation activities.

(ii) The validation organization shall demonstrate competence and experience in either power press design,

manufacture or use, or testing, quality control or certification/validation of equipment comparable to power presses and associated control systems.

(iii) The validation organization shall demonstrate a capability for selecting, reviewing, and/or validating appropriate standards and test methods to be used for validating the certification of PSDI safety systems, as well as for reviewing judgments on the safety of PSDI safety systems and their conformance with the requirements of this section.

(iv) The validating organization may utilize the competence, experience, and capability of its employees to demonstrate this competence, experience, and capability.

(b) Independence of validation organization.

(i) The validation organization shall demonstrate that:

(A) It is financially capable to conduct the work;

(B) It is free of direct influence or control by manufacturers, suppliers, vendors, representatives of employers and employees, and employer or employee organizations; and

(C) Its employees are secure from discharge resulting from pressures from manufacturers, suppliers, vendors, employers or employee representatives.

(ii) A validation organization may be considered independent even if it has ties with manufacturers, employers or employee representatives if these ties are with at least two of these three groups; it has a board of directors (or equivalent leadership responsible for the certification/validation activities) which includes representatives of the three groups; and it has a binding commitment of funding for a period of three years or more.

(c) Validating laboratory. The validation organization's laboratory (which organizationally may be a part of the third-party validation organization):

(i) Shall have legal authority to perform the validation of certification;

(ii) Shall be free of operational control and influence of manufacturers, suppliers, vendors, employers or employee representatives that would impair its integrity of performance; and

(iii) Shall not engage in the design, manufacture, sale, promotion, or use of the certified equipment.

(d) Facilities and equipment. The validation organization's validating laboratory shall have available all testing facilities and necessary test and inspection equipment relevant to the validation of the certification of PSDI safety systems, installations and operations.

(e) Personnel. The validation organization and the validating laboratory shall be adequately staffed by personnel who are qualified by technical training and/or experience to conduct the validation of the certification of PSDI safety systems.

(i) The validation organization shall assign overall responsibility for the validation of PSDI certification to an administrative director. Minimum requirements for this position are a bachelor's degree and five years professional experience, at least one of which shall have been in responsible charge of a function in the areas of power press design or manufacture or a broad range of power

press use, or in the areas of testing, quality control, or certification/validation of equipment comparable to power presses or their associated control systems.

(ii) The validating laboratory, if a separate organization from the validation organization, shall assign technical responsibility for the validation of PSDI certification to a technical director. Minimum requirements for this position are a bachelor's degree in a technical field and five years of professional experience, at least one of which shall have been in responsible charge of a function in the area of testing, quality control or certification/validation of equipment comparable to power presses or their associated control systems.

(iii) If the validation organization and the validating laboratory are the same organization, the administrative and technical responsibilities may be combined in a single position, with minimum requirements as described in (e)(i) and (ii) of this subsection for the combined position.

(iv) The validation organization and validating laboratory shall have adequate administrative and technical staffs to conduct the validation of the certification of PSDI safety systems.

(f) Certification/validation mark or logo.

(i) The validation organization or the validating laboratory shall own a registered certification/validation mark or logo.

(ii) The mark or logo shall be suitable for incorporation into the label required by WAC 296-24-19517 (11)(c) of this part.

(4) Program requirements.

(a) Test and certification/validation procedures.

(i) The validation organization and/or validating laboratory shall have established written procedures for test and certification/validation of PSDI safety systems. The procedures shall be based on pertinent OSHA standards and test methods, or other publicly available standards and test methods generally recognized as appropriate in the field, such as national consensus standards or published standards of professional societies or trade associations.

(ii) The written procedures for test and certification/validation of PSDI systems, and the standards and test methods on which they are based, shall be reproducible and be available to OSHA and to the public upon request.

(b) Test reports.

(i) A test report shall be prepared for each PSDI safety system that is tested. The test report shall be signed by a technical staff representative and the technical director.

(ii) The test report shall include the following:

(A) Name of manufacturer and catalog or model number of each subsystem or major component.

(B) Identification and description of test methods or procedures used. (This may be through reference to published sources which describe the test methods or procedures used.)

(C) Results of all tests performed.

(D) All safety distance calculations.

(iii) A copy of the test report shall be maintained on file at the validation organization and/or validating laboratory, and shall be available to OSHA upon request.

(c) Certification/validation reports.

(i) A certification/validation report shall be prepared for each PSDI safety system for which the certification is validated. The certification/validation report shall be signed by the administrative director and the technical director.

(ii) The certification/validation report shall include the following:

(A) Name of manufacturer and catalog or model number of each subsystem or major component.

(B) Results of all tests which serve as the basis for the certification.

(C) All safety distance calculations.

(D) Statement that the safety system conforms with all requirements of the PSDI standard and WAC 296-24-20700, Appendix A.

(iii) A copy of the certification/validation report shall be maintained on file at the validation organization and/or validating laboratory, and shall be available to the public upon request.

(iv) A copy of the certification/validation report shall be submitted to OSHA within thirty days of its completion.

(d) Publications system. The validation organization shall make available upon request a list of PSDI safety systems which have been certified/validated by the program.

(e) Follow-up activities.

(i) The validation organization or validating laboratory shall have a follow-up system for inspecting or testing manufacturer's production of design certified/validated PSDI safety system components and subassemblies where deemed appropriate by the validation organization.

(ii) The validation organization shall notify the appropriate product manufacturer(s) of any reports from employers of point of operation injuries which occur while a press is operated in a PSDI mode.

(f) Records. The validation organization or validating laboratory shall maintain a record of each certification/validation of a PSDI safety system, including manufacturer and/or employer certification documentation, test and working data, test report, certification/validation report, any follow-up inspections or testing, and reports of equipment failures, any reports of accidents involving the equipment, and any other pertinent information. These records shall be available for inspection by OSHA and OSHA state plan offices.

(g) Dispute resolution procedures.

(i) The validation organization shall have a reasonable written procedure for acknowledging and processing appeals or complaints from program participants (manufacturers, producers, suppliers, vendors, and employers) as well as other interested parties (employees or their representatives, safety personnel, government agencies, etc.), concerning certification or validation.

(ii) The validation organization may charge any complainant the reasonable charge for repeating tests needed for the resolution of disputes.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-20720, filed 11/14/88.]

WAC 296-24-20730 Appendix D to WAC 296-24-195. Nonmandatory supplementary information.

(1) This Appendix provides nonmandatory supplementary information and guidelines to assist in the understanding and use of WAC 296-24-19517 to allow presence sensing device initiation (PSDI) of mechanical power presses. Although this Appendix as such is not mandatory, it references sections and requirements which are made mandatory by other parts of the PSDI standard and appendices.

(2) General. OSHA intends that PSDI continue to be prohibited where present state-of-the-art technology will not allow it to be done safely. Only part revolution type mechanical power presses are approved for PSDI. Similarly, only presses with a configuration such that a person's body cannot completely enter the bed area are approved for PSDI.

(3) Brake and clutch.

(a) Flexible steel band brakes do not possess a long-term reliability against structural failure as compared to other types of brakes, and therefore are not acceptable on presses used in the PSDI mode of operation.

(b) Fast and consistent stopping times are important to safety for the PSDI mode of operation. Consistency of braking action is enhanced by high brake torque. The requirement in WAC 296-24-19517 (2)(b) defines a high torque capability which should ensure fast and consistent stopping times.

(c) Brake design parameters important to PSDI are high torque, low moment of inertia, low air volume (if pneumatic) mechanisms, noninterleaving engagement springs, and structural integrity which is enhanced by over-design. The requirement in WAC 296-24-19517 (2)(c) reduces the possibility of significantly increased stopping time if a spring breaks.

(d) As an added precaution to the requirements in WAC 296-24-19517 (2)(c), brake adjustment locking means should be secured. Where brake springs are externally accessible, lock nuts or other means may be provided to reduce the possibility of backing off of the compression nut which holds the springs in place.

(4) Pneumatic systems. Elevated clutch/brake air pressure results in longer stopping time. The requirement in WAC 296-24-19517 (3)(a)(iii) is intended to prevent degradation in stopping speed from higher air pressure. Higher pressures may be permitted, however, to increase clutch torque to free "jammed" dies, provided positive measures are provided to prevent the higher pressure at other times.

(5) Flywheels and bearings. Lubrication of bearings is considered the single greatest deterrent to their failure. The manufacturer's recommended procedures for maintenance and inspection should be closely followed.

(6) Brake monitoring.

(a) The approval of brake monitor adjustments, as required in WAC 296-24-19517 (5)(b), is not considered a recertification, and does not necessarily involve an on-site inspection by a representative of the validation organization. It is expected that the brake monitor adjustment normally could be evaluated on the basis of the effect on the safety system certification/validation documentation retained by the validation organization.

(b) Use of a brake monitor does not eliminate the need for periodic brake inspection and maintenance to reduce the possibility of catastrophic failures.

(7) Cycle control and control systems.

(a) The PSDI set-up/reset means required by WAC 296-24-19517 (6)(d) may be initiated by the actuation of a special momentary pushbutton or by the actuation of a special momentary pushbutton and the initiation of a first stroke with two hand controls.

(b) It would normally be preferable to limit the adjustment of the time required in WAC 296-24-19517 (6)(b) to a maximum of fifteen seconds. However, where an operator must do many operations outside the press, such as lubricating, trimming, deburring, etc., a longer interval up to thirty seconds is permitted.

(c) When a press is equipped for PSDI operation, it is recommended that the presence sensing device be active as a guarding device in other production modes. This should enhance the reliability of the device and ensure that it remains operable.

(d) An acceptable method for interlocking supplemental guards as required by WAC 296-24-19517 (6)(h) would be to incorporate the supplemental guard and the PSDI presence sensing device into a hinged arrangement in which the alignment of the presence sensing device serves, in effect, as the interlock. If the supplemental guards are moved, the presence sensing device would become misaligned and the press control would be deactivated. No extra microswitches or interlocking sensors would be required.

(e) WAC 296-24-19517 (6)(a) of the standard requires that the control system have provisions for an "inch" operating means; that die-setting not be done in the PSDI mode; and that production not be done in the "inch" mode. It should be noted that the sensing device would be by-passed in the "inch" mode. For that reason, the prohibitions against die-setting in the PSDI mode, and against production in the "inch" mode are cited to emphasize that "inch" operation is of reduced safety and is not compatible with PSDI or other production modes.

(8) Environmental requirements. It is the intent of WAC 296-24-19517(7) that control components be provided with inherent design protection against operating stresses and environmental factors affecting safety and reliability.

(9) Safety system.

(a) The safety system provision continues the concept of WAC 296-24-19505(13) that the probability of two independent failures in the length of time required to make one press cycle is so remote as to be a negligible risk factor in the total array of equipment and human

factors. The emphasis is on an integrated total system including all elements affecting point of operation safety.

(b) It should be noted that this does not require redundancy for press components such as structural elements, clutch/brake mechanisms, plates, etc., for which adequate reliability may be achieved by proper design, maintenance, and inspection.

(10) Safeguarding the point of operation.

(a) The intent of WAC 296-24-19517 (9)(c) is to prohibit use of mirrors to "bend" a single light curtain sensing field around corners to cover more than one side of a press. This prohibition is needed to increase the reliability of the presence sensing device in initiating a stroke only when the desired work motion has been completed.

(b) "Object sensitivity" describes the capability of a presence sensing device to detect an object in the sensing field, expressed as the linear measurement of the smallest interruption which can be detected at any point in the field. Minimum object sensitivity describes the largest acceptable size of the interruption in the sensing field. A minimum object sensitivity of one and one-fourth inches (31.75 mm) means that a one and one-fourth inch (31.75 mm) diameter object will be continuously detected at all locations in the sensing field.

(c) In deriving the safety distance required in WAC 296-24-19517 (9)(f), all stopping time measurements should be made with clutch/brake air pressure regulated to the press manufacturer's recommended value for full clutch torque capability. The stopping time measurements should be made with the heaviest upper die that is planned for use in the press. If the press has a slide counterbalance system, it is important that the counterbalance be adjusted correctly for upper die weight according to the manufacturer's instructions. While the brake monitor setting is based on the stopping time it actually measures, i.e., the normal stopping time at the top of the stroke, it is important that the safety distance be computed from the longest stopping time measured at any of the indicated three downstroke stopping positions listed in the explanation of Ts. The use in the formula of twice the stopping time increase, T_m , allowed by the brake monitor for brake wear allows for greater increases in the downstroke stopping time than occur in normal stopping time at the top of the stroke.

(11) Inspection and maintenance. [Reserved]

(12) Safety system certification/validation. Mandatory requirements for certification/validation of the PSDI safety system are provided in WAC 296-24-20700, Appendix A, and 296-24-20720, Appendix C to this standard. Nonmandatory supplementary information and guidelines relating to certification/validation of the PSDI safety system are provided in WAC 296-24-20710, Appendix B to this standard.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-20730, filed 11/14/88.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear herein pursuant to the requirements of RCW 34.08.040.

Part D
MATERIALS HANDLING AND STORAGE,
INCLUDING CRANES, DERRICKS, ETC., AND
RIGGING

WAC

296-24-21701	Scope.
296-24-21707	Tire servicing equipment.
296-24-23001	Definition.
296-24-24017	Other requirements.
296-24-24519	Other requirements.

WAC 296-24-21701 Scope. (1) This section applies to the servicing of multi-piece and single-piece rim wheels used on large vehicles such as trucks, tractors, trailers, buses and off-road machines. It does not apply to the servicing of rim wheels used on automobiles, or on pickup trucks and vans utilizing automobile tires or truck tires designated "LT."

(2) This section does not apply to employers and places of employment regulated under the Construction safety standards, chapter 296-155 WAC.

(3) All provisions of this section apply to the servicing of both single-piece rim wheels and multi-piece rim wheels unless designated otherwise.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-24-21701, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 84-17-099 (Order 84-18), § 296-24-21701, filed 8/21/84. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-24-21701, filed 11/13/80.]

WAC 296-24-21707 Tire servicing equipment. (1) The employer shall furnish a restraining device for inflating tires on multi-piece wheels.

(2) The employer shall provide a restraining device or barrier for inflating tires on single-piece wheels unless the rim wheel will be bolted onto a vehicle during inflation.

(3) Restraining devices and barriers shall comply with the following requirements:

(a) Each restraining device or barrier shall have the capacity to withstand the maximum force that would be transferred to it during a rim wheel separation occurring at one hundred fifty percent of the maximum tire specification pressure for the type of rim wheel being serviced.

(b) Restraining devices and barriers shall be capable of preventing the rim wheel components from being thrown outside or beyond the device or barrier for any rim wheel positioned within or behind the device;

(c) Restraining devices and barriers shall be visually inspected prior to each day's use and after any separation of the rim wheel components or sudden release of contained air. Any restraining device or barrier exhibiting damage such as the following defects shall be immediately removed from service:

- (i) Cracks at welds;
- (ii) Cracked or broken components;
- (iii) Bent or sprung components caused by mishandling, abuse, tire explosion or rim wheel separation;
- (iv) Pitting of components due to corrosion; or
- (v) Other structural damage which would decrease its effectiveness.

(d) Restraining devices or barriers removed from service shall not be returned to service until they are repaired and reinspected. Restraining devices or barriers requiring structural repair such as component replacement or rewelding shall not be returned to service until they are certified by either the manufacturer or a registered professional engineer as meeting the strength requirements of (a) of this subsection.

(4) The employer shall furnish and assure that an air line assembly consisting of the following components be used for inflating tires:

- (a) A clip-on chuck;
- (b) An in-line valve with a pressure gauge or a presettable regulator; and
- (c) A sufficient length of hose between the clip-on chuck and the in-line valve (if one is used) to allow the employee to stand outside the trajectory.

(5) Current charts (rim manuals) containing instructions for the types of wheels being serviced shall be available in the service area.

(6) The employer shall furnish and assure that only tools recommended in the rim manual for the type of wheel being serviced are used to service rim wheels.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-24-21707, filed 5/11/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-24-21707, filed 1/17/86; 84-17-099 (Order 84-18), § 296-24-21707, filed 8/21/84. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-24-21707, filed 11/13/80.]

WAC 296-24-23001 Definition. These definitions are applicable to all sections of this chapter containing WAC 296-24-230 in the section number. As used in those sections, the term, "approved truck" or "approved industrial truck" means a truck that is listed or approved for fire safety purposes for the intended use by a nationally recognized testing laboratory, using nationally recognized testing standards. Refer to WAC 296-24-58501(19) for definition of listed, and to federal regulation 29 CFR 1910.7 for definition of nationally recognized testing laboratory.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-23001, filed 11/14/88; Order 74-27, § 296-24-23001, filed 5/7/74; Order 73-5, § 296-24-23001, filed 5/9/73 and Order 73-4, § 296-24-23001, filed 5/7/73.]

WAC 296-24-24017 Other requirements. (1) Rail clamps. Rail clamps shall not be used as a means of restraining tipping of a locomotive crane.

(2) Ballast or counterweight. Cranes shall not be operated without the full amount of any ballast or counterweight in place as specified by the maker, but truck cranes that have dropped the ballast or counterweight may be operated temporarily with special care and only for light loads without full ballast or counterweight in place. The ballast or counterweight in place specified by the manufacturer shall not be exceeded.

(3) Cabs.

(a) Necessary clothing and personal belongings shall be stored in such a manner as to not interfere with access or operation.

(b) Tools, oil cans, waste, extra fuses, and other necessary articles shall be stored in the tool box, and shall not be permitted to lie loose in or about the cab.

(4) Refueling.

(a) Refueling with small portable containers shall be done with an approved safety type can equipped with an automatic closing cap and flame arrester. Refer to WAC 296-24-58501(19) for definition of approved.

(b) Machines shall not be refueled with the engine running.

(5) Fire extinguishers.

(a) A carbon dioxide, dry chemical, or equivalent fire extinguisher shall be kept in the cab or vicinity of the crane.

(b) Operating and maintenance personnel shall be made familiar with the use and care of the fire extinguishers provided.

(6) Swinging locomotive cranes. A locomotive crane shall not be swung into a position where railway cars on an adjacent track might strike it, until it has been ascertained that cars are not being moved on the adjacent track and proper flag protection has been established.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-24017, filed 11/14/88; Order 73-5, § 296-24-24017, filed 5/9/73 and Order 73-4, § 296-24-24017, filed 5/7/73.]

WAC 296-24-24519 Other requirements. (1) Guards.

(a) Exposed moving parts, such as gears, ropes, set-screws, projecting keys, chains, chain sprockets, and reciprocating components, which constitute a hazard under normal operating conditions shall be guarded.

(b) Guards shall be securely fastened.

(c) Each guard shall be capable of supporting without permanent distortion, the weight of a two hundred-pound person unless the guard is located where it is impossible for a person to step on it.

(2) Hooks.

(a) Hooks shall meet the manufacturer's recommendations and shall not be overloaded.

(b) Safety latch type hooks shall be used or the hooks shall be moused.

(3) Fire extinguishers.

(a) A carbon dioxide, dry chemical, or equivalent fire extinguisher shall be kept in the immediate vicinity of the derrick.

(b) Operating and maintenance personnel shall be familiar with the use and care of the fire extinguishers provided.

(4) Refueling.

(a) Refueling with portable containers shall be done with approved safety type containers equipped with automatic closing spout and flame arrester. Refer to WAC 296-24-58501(19) for definition of approved.

(b) Machines shall not be refueled with the engine running.

(5) Operating near electric powerlines.

(a) Except where the electrical distribution and transmission lines have been deenergized and visibility grounded at point of work or where insulating barriers not a part of or an attachment to the derrick have been

erected to prevent physical contact with the lines, derricks shall be operated proximate to, under, over, by, or near powerlines only in accordance with the following:

(i) For lines rated 50 kv. or below minimum clearance between the lines and any part of the derrick or load shall be ten feet.

(ii) For lines rated over 50 kv. minimum clearance between lines and any part of the derrick or load shall be ten feet plus 0.4 inch for each 1 kv. over 50 kv., or use twice the length of the line insulator, but never less than ten feet.

(b) Cage-type boom guards, insulating links, or proximity warning devices may be used on derricks, but the use of such devices shall not operate to alter the requirements of (a) of this subsection.

(c) Before the commencement of operations near electrical lines, the owners of the lines or their authorized representatives shall be notified and provided with pertinent information. The owner's cooperation shall be requested.

(d) Any overhead wire shall be considered to be an energized line until the owner of the line or their authorized representatives state that it is deenergized.

(6) Cab or operating enclosure.

(a) Necessary clothing and personnel belongings shall be stored in such a manner as to not interfere with access or operation.

(b) Tools, oilcans, waste, extra fuses, and other necessary articles shall be stored in the toolbox, and shall not be permitted to lie loose in or about the cab or operating enclosure.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-24519, filed 11/14/88. Statutory Authority: RCW 49-17.040, 49.17.150, and 49.17.240. 79-08-115 (Order 79-9), § 296-24-24519, filed 7/31/79; Order 73-5, § 296-24-24519, filed 5/9/73 and Order 73-4, § 296-24-24519, filed 5/7/73.]

Part E

HAZARDOUS MATERIALS, FLAMMABLE AND COMBUSTIBLE LIQUIDS, SPRAY FINISHING, DIP TANKS

WAC

296-24-31501	General.
296-24-31503	Gaseous hydrogen systems.
296-24-31505	Liquefied hydrogen systems.
296-24-33001	Definitions.
296-24-33005	Tank storage.
296-24-37001	Definitions.
296-24-40501	Definitions.

WAC 296-24-31501 General. (1) Definitions as used in this section.

(a) Gaseous hydrogen system is one in which the hydrogen is delivered, stored and discharged in the gaseous form to consumer's piping. The system includes stationary or movable containers, pressure regulators, safety relief devices, manifolds, interconnecting piping and controls. The system terminates at the point where hydrogen at service pressure first enters the consumer's distribution piping.

(b) Approved—Means unless otherwise indicated, listed or approved by a nationally recognized testing

laboratory. Refer to federal regulation 29 CFR 1910.7 for definition of nationally recognized testing laboratory.

(c) Listed—See "approved."

(d) ASME—American Society of Mechanical Engineers.

(e) DOT specifications—Regulations of the department of transportation published in 49 CFR Chapter I.

(f) DOT regulations—See WAC 296-24-315.

(2) Scope.

(a) Gaseous hydrogen systems.

(i) WAC 296-24-31503 applies to the installation of gaseous hydrogen systems on consumer premises where the hydrogen supply to the consumer premises originates outside the consumer premises and is delivered by mobile equipment.

(ii) WAC 296-24-31503 does not apply to gaseous hydrogen systems having a total hydrogen content of less than four hundred cubic feet, nor to hydrogen manufacturing plants or other establishments operated by the hydrogen supplier or his agent for the purpose of storing hydrogen and refilling portable containers, trailers, mobile supply trucks, or tank cars.

(b) Liquefied hydrogen systems.

(i) WAC 296-24-31505 applies to the installation of liquefied hydrogen systems on consumer premises.

(ii) WAC 296-24-31505 does not apply to liquefied hydrogen portable containers of less than one hundred fifty liters (39.63 gallons) capacity; nor to liquefied hydrogen manufacturing plants or other establishments operated by the hydrogen supplier or his agent for the sole purpose of storing liquefied hydrogen and refilling portable containers, trailers, mobile supply trucks or tank cars.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-31501, filed 11/14/88; Order 73-5, § 296-24-31501, filed 5/9/73 and Order 73-4, § 296-24-31501, filed 5/7/73.]

WAC 296-24-31503 Gaseous hydrogen systems. (1) Design.

(a) Containers.

(i) Hydrogen containers shall comply with one of the following:

(A) Designed, constructed, and tested in accordance with appropriate requirements of ASME Boiler and Pressure Vessel Code, Section VIII—Unfired Pressure Vessels—1968.

(B) Designed, constructed, tested and maintained in accordance with U.S. Department of Transportation specifications and regulations.

(ii) Permanently installed containers shall be provided with substantial noncombustible supports on firm noncombustible foundations.

(iii) Each portable container shall be legibly marked with the name "hydrogen" in accordance with "marking compressed gas containers to identify the material contained" ANSI Z48.1-1954. Each manifolded hydrogen supply unit shall be legibly marked with the name hydrogen or a legend such as "this unit contains hydrogen."

(b) Safety relief devices.

(i) Hydrogen containers shall be equipped with safety relief devices as required by the ASME Boiler and Pressure Vessel Code, Section VIII Unfired Pressure Vessels, 1968 or the DOT specifications and regulations under which the container is fabricated.

(ii) Safety relief devices shall be arranged to discharge upward and unobstructed to the open air in such a manner as to prevent any impingement of escaping gas upon the container, adjacent structure of personnel. This requirement does not apply to DOT specification containers having an internal volume of 2 cubic feet or less.

(iii) Safety relief devices or vent piping shall be designed or located so that moisture cannot collect and freeze in a manner which would interfere with proper operation of the device.

(c) Piping, tubing, and fittings.

(i) Piping, tubing, and fittings shall be suitable for hydrogen service and for the pressures and temperatures involved. Case iron pipe and fittings shall not be used.

(ii) Piping and tubing shall conform to Section 2—"Industrial Gas and Air Piping"—Code for Pressure Piping, ANSI B31.1-1967 with addenda B31.1-1969.

(iii) Joints in piping and tubing may be made by welding or brazing or by use of flanged, threaded, socket, or compression fittings. Gaskets and thread sealants shall be suitable for hydrogen service.

(d) Equipment assembly.

(i) Valves, gauges, regulators, and other accessories shall be suitable for hydrogen service.

(ii) Installation of hydrogen systems shall be supervised by personnel familiar with proper practices with reference to their construction and use.

(iii) Storage containers, piping, valves, regulating equipment, and other accessories shall be readily accessible, and shall be protected against physical damage and against tampering.

(iv) Cabinets or housings containing hydrogen control or operating equipment shall be adequately ventilated.

(v) Each mobile hydrogen supply unit used as part of a hydrogen system shall be adequately secured to prevent movement.

(vi) Mobile hydrogen supply units shall be electrically bonded to the system before discharging hydrogen.

(e) Marking. The hydrogen storage location shall be permanently placarded as follows: "HYDROGEN—FLAMMABLE GAS—NO SMOKING—NO OPEN FLAMES," or equivalent.

(f) Testing. After installations, all piping, tubing, and fittings shall be tested and proved hydrogen gas tight at maximum operating pressure.

(2) Location.

(a) General.

(i) The system shall be located so that it is readily accessible to delivery equipment and to authorized personnel.

(ii) Systems shall be located above ground.

(iii) Systems shall not be located beneath electric power lines.

(iv) Systems shall not be located close to flammable liquid piping or piping of other flammable gases.

(v) Systems near aboveground flammable liquid storage shall be located on ground higher than the flammable liquid storage except when dikes, diversion curbs, grading, or separating solid walls are used to prevent accumulation of flammable liquids under the system.

(b) Specific requirements.

(i) The location of a system, as determined by the maximum total contained volume of hydrogen, shall be in the order of preference as indicated by Roman numerals in Table H-1.

TABLE H-1

Nature of location	Size of hydrogen system		
	Less than 3,000 CF	3,000 CF to 15,000 CF	In excess of 15,000 CF
Outdoors	I	I	I
In a separate building	II	II	II
In a special room	III	III	Not permitted.
Inside buildings not in a special room and exposed to other occupancies	IV	Not permitted.	Not permitted.

(ii) The minimum distance in feet from a hydrogen system of indicated capacity located outdoors, in separate buildings or in special rooms to any specified outdoor exposure shall be in accordance with Table H-2.

(iii) The distances in Table H-2 Items 1, 14, and 3 to 10 inclusive do not apply where protective structures such as adequate fire walls are located between the system and the exposure.

(iv) Hydrogen systems of less than 3,000 CF when located inside buildings and exposed to other occupancies shall be situated in the building so that the system will be as follows:

- (A) In an adequately ventilated area as in (3)(b)(ii) of this section.
- (B) Twenty feet from stored flammable materials or oxidizing gases.
- (C) Twenty-five feet from open flames, ordinary electrical equipment or other sources of ignition.
- (D) Twenty-five feet from concentrations of people.
- (E) Fifty feet from intakes of ventilation or air-conditioning equipment and air compressors.
- (F) Fifty feet from other flammable gas storage.
- (G) Protected against damage or injury due to falling objects or working activity in the area.

(H) More than one system of 3,000 CF or less may be installed in the same room, provided the systems are separated by at least 50 feet. Each such system shall meet all of the requirements of this section.

(3) Design consideration at specific locations.

(a) Outdoor locations.

(i) Where protective walls or roofs are provided, they shall be constructed of noncombustible materials.

(ii) Where the enclosing sides adjoin each other, the area shall be properly ventilated.

(iii) Electrical equipment shall meet the requirements for Class I, Division 2 hazardous locations of WAC 296-24-95613.

(b) Separate buildings.

(i) Separate buildings shall be built of at least non-combustible construction. Windows and doors shall be located so as to be readily accessible in case of emergency. Windows shall be of glass or plastic in metal frames.

(ii) Adequate ventilation to the outdoors shall be provided. Inlet openings shall be located near the floor in exterior walls only. Outlet openings shall be located at the high point of the room in exterior walls or roof. Inlet and outlet openings shall each have minimum total area of one square foot per 1,000 cubic feet of room volume. Discharge from outlet openings shall be directed or conducted to a safe location.

(iii) Explosion venting shall be provided in exterior walls or roof only. The venting area shall be equal to not less than 1 square foot per 30 cubic feet of room volume and may consist of any one or any combination of the following: Walls of light noncombustible material, preferably single thickness, single strength glass; lightly fastened hatch covers; lightly fastened swinging doors in exterior walls opening outward; lightly fastened walls or roof designed to relieve at a maximum pressure of 25 pounds per square foot.

(iv) There shall be no sources of ignition from open flames, electrical equipment, or heating equipment.

(v) Electrical equipment shall meet the requirements for Class I, Division 2 hazardous locations of WAC 296-24-95613.

(vi) Heating, if provided, shall be by steam, hot water, or other indirect means.

(c) Special rooms.

(i) Floor, walls, and ceiling shall have a fire-resistance rating of at least 2 hours. Walls or partitions shall be continuous from floor to ceiling and shall be securely anchored. At least one wall shall be an exterior wall. Openings to other parts of the building shall not be permitted. Windows and doors shall be in exterior walls and shall be located so as to be readily accessible in case of emergency. Windows shall be of glass or plastic in metal frames.

(ii) Ventilation shall be as provided in (3)(b)(ii) of this section.

(iii) Explosion venting shall be as provided in (3)(b)(iii) of this section.

(iv) There shall be no sources of ignition from open flames, electrical equipment or heating equipment.

(v) Electrical equipment shall meet the requirements for Class I, Division 2 hazardous locations of WAC 296-24-95613.

(vi) Heating, if provided, shall be by steam, hot water, or indirect means.

(4) Operating instructions. For installations which require any operation of equipment by the user, legible instructions shall be maintained at operating locations.

(5) Maintenance.

(a) The equipment and functioning of each charged gaseous hydrogen system shall be maintained in a safe operating condition in accordance with the requirements of this section. The area within 15 feet of any hydrogen container shall be kept free of dry vegetation and combustible material.

TABLE H-2

Type of outdoor exposure	Size of hydrogen system			
	Less than 3,000 CF	3,000 to 15,000 CF	In excess of 15,000 CF	
1. Building or structure	Wood frame construction* _____	10	25	50
	Heavy timber, non-combustible or ordinary construction* _____	0	10	**25
	Fire-resistive construction* _____	0	0	0
2. Wall openings	Not above any part of a system _____	10	10	10
	Above any part of a system _____	25	25	25
3. Flammable liquids above ground	0 to 1,000 gallons _____	10	25	25
	In excess of 1,000 gallons _____	25	50	50
4. Flammable liquids below ground—0 to 1,000 gallons	Tank _____	10	10	10
	Vent or fill opening of tank _____	25	25	25
5. Flammable liquids below ground—in excess of 1,000 gallons	Tank _____	20	20	20
	Vent or fill opening of tank _____	25	25	25
6. Flammable gas storage, either high pressure or low pressure	0 to 15,000 CF capacity _____	10	25	25
	In excess of 15,000 CF capacity _____	25	50	50
7. Oxygen storage	12,000 CF or less _____	Refer to NFPA No. 51, gas systems for welding and cutting (1969).		
	More than 12,000 CF _____	Refer to NFPA No. 566, bulk oxygen systems at consumer sites (1969).		
8. Fast burning solids such as ordinary lumber, excelsior or paper	_____	50	50	25

TABLE H-2

Type of outdoor exposure	Size of hydrogen system		
	Less than 3,000 CF	3,000 to 15,000 CF	In excess of 15,000 CF
9. Slow burning solids such as heavy timber or coal _____	25	25	25
10. Open flames and other sources of ignition _____	25	25	50
11. Air compressor intakes or inlets to ventilating or air-condition equipment _____	50	50	50
12. Concentration of people*** _____	25	50	50
13. Public sidewalks _____	15	15	15
14. Line of adjoining property which may be built upon _____	5	5	5

*Refer to NFPA No. 220 standard types of building construction for definitions of various types of construction. (1969 Ed.)

**But not less than one-half the height of adjacent side wall of the structure.

***In congested areas such as offices, lunchrooms, locker rooms, time-clock areas, and places of public assembly.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-31503, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 85-10-004 (Order 85-09), § 296-24-31503, filed 4/19/85; Order 76-6, § 296-24-31503, filed 3/1/76; Order 73-5, § 296-24-31503, filed 5/9/73 and Order 73-4, § 296-24-31503, filed 5/7/73.]

WAC 296-24-31505 Liquefied hydrogen systems.

(1) Design.

(a) Containers.

(i) Hydrogen containers shall comply with the following: Storage containers shall be designed, constructed, and tested in accordance with appropriate requirements of the ASME Boiler and Pressure Vessel Code, Section VIII—Unfired Pressure Vessels (1968) or applicable provisions of API Standard 620, Recommended Rules for Design and Construction of Large, Welded, Low-Pressure Storage Tanks, Second Edition (June 1963) and Appendix R (April 1965).

(ii) Portable containers shall be designed, constructed and tested in accordance with DOT specifications and regulations.

(b) Supports. Permanently installed containers shall be provided with substantial noncombustible supports securely anchored on firm noncombustible foundations. Steel supports in excess of 18 inches in height shall be protected with a protective coating having a 2-hour fire-resistance rating.

(c) Marking. Each container shall be legibly marked to indicate "LIQUEFIED HYDROGEN—FLAMMABLE GAS."

(d) Safety relief devices.

(i) Stationary liquefied hydrogen containers shall be equipped with safety relief devices sized in accordance with CGA Pamphlet S-1-1966, Part 3, Safety Relief Device Standards for Compressed Gas Storage Containers.

(A) Portable liquefied hydrogen containers complying with the U.S. Department of Transportation regulations shall be equipped with safety relief devices as required in the U.S. Department of Transportation specifications and regulations. Safety relief devices shall be sized in accordance with the requirements of CGA Pamphlet S-1-1966, Safety Relief Device Standards, Part 1, Compressed Gas Cylinders and Part 2, Cargo and Portable Tank Containers.

(ii) Safety relief devices shall be arranged to discharge unobstructed to the outdoors and in such a manner as to prevent impingement of escaping liquid or gas upon the container, adjacent structures or personnel. See (2)(a)(vi) of this section for venting of safety relief devices in special locations.

(iii) Safety relief devices or vent piping shall be designed or located so that moisture cannot collect and freeze in a manner which would interfere with proper operation of the device.

(iv) Safety relief devices shall be provided in piping wherever liquefied hydrogen could be trapped between closures

(e) Piping, tubing, and fittings.

(i) Piping, tubing, and fittings and gasket and thread sealants shall be suitable for hydrogen service at the pressures and temperatures involved. Consideration shall be given to the thermal expansion and contraction of piping systems when exposed to temperature fluctuations of ambient to liquefied hydrogen temperatures.

(ii) Gaseous hydrogen piping and tubing (above—20°F) shall conform to the applicable sections of Pressure Piping Section 2—Industrial Gas and Air Piping, ANSI B31.1-1967 with addenda B31.1-1969. Design of liquefied hydrogen or cold (-20°F or below) gas piping shall use Petroleum Refinery Piping ANSI B31.3-1966 or Refrigeration Piping ANSI B31.5-1966 with addenda B31.5a-1968 as a guide.

(iii) Joints in piping and tubing shall preferably be made by welding or brazing; flanged, threaded, socket, or suitable compression fittings may be used.

(iv) Means shall be provided to minimize exposure of personnel to piping operating at low temperatures and to prevent air condensate from contacting piping, structural members, and surfaces not suitable for cryogenic temperatures. Only those insulating materials which are rated nonburning in accordance with ASTM Procedures D1692-68 may be used. Other protective means may be used to protect personnel. The insulation shall be designed to have a vapor-tight seal in the outer covering to prevent the condensation of air and subsequent oxygen enrichment within the insulation. The insulation material and outside shield shall also be of adequate design to

prevent attrition of the insulation due to normal operating conditions.

(v) Uninsulated piping and equipment which operate at liquefied-hydrogen temperature shall not be installed above asphalt surfaces or other combustible materials in order to prevent contact of liquid air with such materials. Drip pans may be installed under uninsulated piping and equipment to retain and vaporize condensed liquid air.

(f) Equipment assembly.

(i) Valves, gauges, regulators, and other accessories shall be suitable for liquefied hydrogen service and for the pressures and temperatures involved.

(ii) Installation of liquefied hydrogen systems shall be supervised by personnel familiar with proper practices and with reference to their construction and use.

(iii) Storage containers, piping, valves, regulating equipment, and other accessories shall be readily accessible and shall be protected against physical damage and against tampering. A shutoff valve shall be located in liquid product withdrawal lines as close to the container as practical. On containers of over 2,000 gallons capacity, this shutoff valve shall be of the remote control type with no connections, flanges, or other appurtenances (other than a welded manual shutoff valve) allowed in the piping between the shutoff valve and its connection to the inner container.

(iv) Cabinets or housings containing hydrogen control equipment shall be ventilated to prevent any accumulation of hydrogen gas.

(g) Testing.

(i) After installation, all field-erected piping shall be tested and proved hydrogen gas-tight at operating pressure and temperature.

(ii) Containers if out of service in excess of 1 year shall be inspected and tested as outlined in (1) of this section. The safety relief devices shall be checked to determine if they are operable and properly set.

(h) Liquefied hydrogen vaporizers.

(i) The vaporizer shall be anchored and its connecting piping shall be sufficiently flexible to provide for the effect of expansion and contraction due to temperature changes.

(ii) The vaporizer and its piping shall be adequately protected on the hydrogen and heating media sections with safety relief devices.

(iii) Heat used in a liquefied hydrogen vaporizer shall be indirectly supplied utilizing media such as air, steam, water, or water solutions.

(iv) A low temperature shutoff switch shall be provided in the vaporizer discharge piping to prevent flow of liquefied hydrogen in the event of the loss of the heat source.

(i) Electrical systems.

(i) Electrical wiring and equipment located within 3 feet of a point where connections are regularly made and disconnected, shall meet the requirements of WAC 296-24-956 through 296-24-960 for Class I, Division 1 locations.

(ii) Except as provided in (1) of this section, electrical wiring, and equipment located within 25 feet of a point

where connections are regularly made and disconnected or within 25 feet of a liquid hydrogen storage container, shall meet the requirements of WAC 296-24-956 through 296-24-960 for Class I, Division 2 locations. When equipment approved for Class I, environments is not commercially available, the equipment may be:

(A) Purged or ventilated in accordance with NFPA No. 496-1967, Standard for Purged Enclosures for Electrical Equipment in Hazardous Locations,

(B) Intrinsically safe, or

(C) Approved for Class I, Group C atmospheres. This requirement does not apply to electrical equipment which is installed on mobile supply trucks or tank cars from which the storage container is filled.

(j) Bonding and grounding. The liquefied hydrogen container and associated piping shall be electrically bonded and grounded.

(2) Location of liquefied hydrogen storage.

(a) General requirements.

(i) The storage containers shall be located so that they are readily accessible to mobile supply equipment at ground level and to authorized personnel.

(ii) The containers shall not be exposed by electric power lines, flammable liquid lines, flammable gas lines, or lines carrying oxidizing materials.

(iii) When locating liquefied hydrogen storage containers near above-ground flammable liquid storage or liquid oxygen storage, locate the liquefied hydrogen container on ground higher than flammable liquid storage or liquid oxygen storage.

(iv) Where it is necessary to locate the liquefied hydrogen container on ground that is level with or lower than adjacent flammable liquid storage or liquid oxygen storage, suitable protective means shall be taken (such as by diking, diversion, curbs, grading), with respect to the adjacent flammable liquid storage or liquid oxygen storage, to prevent accumulation of liquids within 50 feet of the liquefied hydrogen container.

(v) Storage sites shall be fenced and posted to prevent entrance by unauthorized personnel. Sites shall also be placarded as follows: "Liquefied hydrogen—Flammable gas—No smoking—No open flames."

(vi) If liquefied hydrogen is located in (as specified in Table H-3) a separate building, in a special room, or inside buildings when not in a special room and exposed to other occupancies, containers shall have the safety relief devices vented unobstructed to the outdoors at a minimum elevation of 25 feet above grade to a safe location as required in (l)(d)(ii) of this section.

(b) Specific requirements.

(i) The location of liquefied hydrogen storage, as determined by the maximum total quantity of liquefied hydrogen, shall be in the order of preference as indicated by Roman numerals in the following Table H-3.

TABLE H-3
MAXIMUM TOTAL QUANTITY OF LIQUEFIED HYDROGEN STORAGE PERMITTED

Nature of location	Size of hydrogen storage (capacity in gallons)			
	39.63 (150 liters) to 50	51 to 300	301 to 600	In excess of 600
Outdoors	I	I	I	I
In a separate building	II	II	II	Not permitted.
In a special room	III	III	Not permitted	Not permitted.
Inside buildings not in a special room and exposed to other occupancies	IV	Not permitted	Not permitted	Not permitted.

Note: This table does not apply to the storage in dewars of the type generally used in laboratories for experimental purposes.

(ii) The minimum distance in feet from liquefied hydrogen systems of indicated storage capacity located outdoors, in a separate building, or in a special room to any specified exposure shall be in accordance with Table H-4.

TABLE H-4
MINIMUM DISTANCE (FEET) FROM LIQUEFIED HYDROGEN SYSTEMS TO EXPOSURE

Type of exposure	Liquefied hydrogen storage (capacity in gallons)		
	39.63 (150 liters) to 3,500	3,501 to 15,000	15,001 to 30,000
1. Fire-resistive building and fire walls*	5	5	5
2. Noncombustible building*	25	50	75
3. Other buildings*	50	75	100
4. Wall openings, air-compressor intakes, inlets for air-conditioning or ventilating equipment	75	75	75
5. Flammable liquids (above ground and vent or fill openings if below ground) (see 513 and 514)	50	75	100
6. Between stationary liquefied hydrogen containers	5	5	5
7. Flammable gas storage	50	75	100
8. Liquid oxygen storage and other oxidizers (see 513 and 514)	100	100	100
9. Combustible solids	50	75	100
10. Open flames, smoking, and welding	50	50	50

11. Concentrations of people**	75	75	75
12. Public ways, railroads, and property lines	25	50	75

*Refer to standard types of building construction, NFPA No. 220-1969 for definitions of various types of construction.

**In congested areas such as offices, lunchrooms, locker rooms, time-clock areas, and places of public assembly.

Note 1: The distance in Nos. 2, 3, 5, 7, 9, and 12 in Table H-4 may be reduced where protective structures, such as firewalls equal to height of top of the container, to safeguard the liquefied hydrogen storage system, are located between the liquefied hydrogen storage installation and the exposure.

Note 2: Where protective structures are provided, ventilation and confinement of product should be considered. The 5-foot distance in Nos. 1 and 6 facilitates maintenance and enhances ventilation.

(c) Handling of liquefied hydrogen inside buildings other than separate buildings and special rooms. Portable liquefied hydrogen containers of 50 gallons or less capacity as permitted in Table H-3 and in compliance with (2)(a)(vi) of this section when housed inside buildings not located in a special room and exposed to other occupancies shall comply with the following minimum requirements:

(i) Be located 20 feet from flammable liquids and readily combustible materials such as excelsior or paper.

(ii) Be located 25 feet from ordinary electrical equipment and other sources of ignition including process or analytical equipment.

(iii) Be located 25 feet from concentrations of people.

(iv) Be located 50 feet from intakes of ventilation and air-conditioning equipment or intakes of compressors.

(v) Be located 50 feet from storage of other flammable-gases or storage of oxidizing gases.

(vi) Containers shall be protected against damage or injury due to falling objects or work activity in the area.

(vii) Containers shall be firmly secured and stored in an upright position.

(viii) Welding or cutting operations, and smoking shall be prohibited while hydrogen is in the room.

(ix) The area shall be adequately ventilated. Safety relief devices on the containers shall be vented directly outdoors or to a suitable hood. See (1)(d)(ii) of this section and (2)(a)(vi) of this section.

(3) Design considerations at specific locations.

(a) Outdoor locations.

(i) Outdoor location shall mean outside of any building or structure, and includes locations under a weather shelter or canopy provided such locations are not enclosed by more than two walls set at right angles and are provided with vent-space between the walls and vented roof or canopy.

(ii) Roadways and yard surfaces located below liquefied hydrogen piping, from which liquid air may drop, shall be constructed of noncombustible materials.

(iii) If protective walls are provided, they shall be constructed of noncombustible materials and in accordance with the provisions of (3)(a)(i) of this section as applicable.

(iv) Electrical wiring and equipment shall comply with (1)(i)(i) and (ii) of this section.

(v) Adequate lighting shall be provided for nighttime transfer operation.

(b) Separate buildings.

(i) Separate buildings shall be of light noncombustible construction on a substantial frame. Walls and roofs shall be lightly fastened and designed to relieve at a maximum internal pressure of 25 pounds per square foot. Windows shall be of shatterproof glass or plastic in metal frames. Doors shall be located in such a manner that they will be readily accessible to personnel in an emergency.

(ii) Adequate ventilation to the outdoors shall be provided. Inlet openings shall be located near the floor level in exterior walls only. Outlet openings shall be located at the high point of the room in exterior walls or roof. Both the inlet and outlet vent openings shall have a minimum total area of 1 square foot per 1,000 cubic feet of room volume. Discharge from outlet openings shall be directed or conducted to a safe location.

(iii) There shall be no sources of ignition.

(iv) Electrical wiring and equipment shall comply with (1)(i)(i) and (ii) of this section except that the provisions of (1)(i)(ii) of this section shall apply to all electrical wiring and equipment in the separate building.

(v) Heating, if provided, shall be by steam, hot water, or other indirect means.

(c) Special rooms.

(i) Floors, walls, and ceilings shall have a fire resistance rating of at least 2 hours. Walls or partitions shall be continuous from floor to ceiling and shall be securely anchored. At least one wall shall be an exterior wall. Openings to other parts of the building shall not be permitted. Windows and doors shall be in exterior walls and doors shall be located in such a manner that they will be accessible in an emergency. Windows shall be of shatterproof glass or plastic in metal frames.

(ii) Ventilation shall be as provided in (3)(b)(ii) of this section.

(iii) Explosion venting shall be provided in exterior walls or roof only. The venting area shall be equal to not less than 1 square foot per 30 cubic feet of room volume and may consist of any one or any combination of the following: Walls of light noncombustible material; lightly fastened hatch covers; lightly fastened swinging doors opening outward in exterior walls; lightly fastened walls or roofs designed to relieve at a maximum pressure of 25 pounds per square foot.

(iv) There shall be no sources of ignition.

(v) Electrical wiring and equipment shall comply with (1)(i)(i) and (ii) of this section except that the provisions of (1)(i)(ii) of this section shall apply to all electrical wiring and equipment in the special room.

(vi) Heating, if provided, shall be steam, hot water, or by other indirect means.

(4) Operating instructions.

(a) Written instructions. For installation which require any operation of equipment by the user, legible instructions shall be maintained at operating locations.

(b) Attendant. A qualified person shall be in attendance at all times while the mobile hydrogen supply unit is being unloaded.

(c) Security. Each mobile liquefied hydrogen supply unit used as part of a hydrogen system shall be adequately secured to prevent movement.

(d) Grounding. The mobile liquefied hydrogen supply unit shall be grounded for static electricity.

(5) Maintenance.

(a) The equipment and functioning of each charged liquefied hydrogen system shall be maintained in a safe operating condition in accordance with the requirements of this section. Weeds or similar combustibles shall not be permitted within 25 feet of any liquified hydrogen equipment.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-31505, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 85-10-004 (Order 85-09), § 296-24-31505, filed 4/19/85; Order 76-6, § 296-24-31505, filed 3/1/76; Order 73-5, § 296-24-31505, filed 5/9/73 and Order 73-4, § 296-24-31505, filed 5/7/73.]

WAC 296-24-33001 Definitions. The following definitions are applicable to all sections of this chapter which include WAC 296-24-330 in the section number.

(1) Aerosol shall mean a material which is dispensed from its container as a mist, spray, or foam by a propellant under pressure.

(2) Atmospheric tank shall mean a storage tank which has been designed to operate at pressures from atmospheric through 0.5 p.s.i.g.

(3) Automotive service station shall mean that portion of property where flammable or combustible liquids used as motor fuels are stored and dispensed from fixed equipment into the fuel tanks of motor vehicles and shall include any facilities available for the sale and service of tires, batteries, and accessories, and for minor automotive maintenance work. Major automotive repairs, painting, body and fender work are excluded.

(4) Basement shall mean a story of a building or structure having one-half or more of its height below ground level and to which access for fire fighting purposes is unduly restricted.

(5) Boiling point shall mean the boiling point of a liquid at a pressure of 14.7 pounds per square inch absolute (p.s.i.a.) (760 mm.). Where an accurate boiling point is unavailable for the material in question, or for mixtures which do not have a constant boiling point, for purposes of this section the ten percent point of a distillation performed in accordance with the Standard Method of Test for Distillation of Petroleum Products, ASTM D-86-62, may be used as the boiling point of the liquid.

(6) Boilover shall mean the expulsion of crude oil (or certain other liquids) from a burning tank. The light fractions of the crude oil burnoff producing a heat wave in the residue, which on reaching a water strata may result in the expulsion of a portion of the contents of the tank in the form of froth.

(7) Bulk plant shall mean that portion of a property where flammable or combustible liquids are received by tank vessel, pipelines, tank car, or tank vehicle, and are stored or blended in bulk for the purpose of distributing such liquids by tank vessel, pipeline, tank car, tank vehicle, or container.

(8) Chemical plant shall mean a large integrated plant or that portion of such a plant other than a refinery or distillery where flammable or combustible liquids are produced by chemical reactions or used in chemical reactions.

(9) Closed container shall mean a container as herein defined, so sealed by means of a lid or other device that neither liquid nor vapor will escape from it at ordinary temperatures.

(10) Crude petroleum shall mean hydrocarbon mixtures that have a flash point below 150°F and which have not been processed in a refinery.

(11) Distillery shall mean a plant or that portion of a plant where flammable or combustible liquids produced by fermentation are concentrated, and where the concentrated products may also be mixed, stored, or packaged.

(12) Fire area shall mean an area of a building separated from the remainder of the building by construction having a fire resistance of at least one hour and having all communicating openings properly protected by an assembly having a fire resistance rating of at least one hour.

(13) Fire resistance or fire resistive construction shall mean construction to resist the spread of fire.

(14) Flammable aerosol shall mean an aerosol which is required to be labeled "Flammable" under the Federal Hazardous Substances Labeling Act (15 U.S.C. 1261). For the purposes of WAC 296-24-33009, such aerosols are considered Class IA liquids.

(15) "Flashpoint" means the minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid, and shall be determined as follows:

(a) For a liquid which has a viscosity of less than 45 SUS at 100°F (37.8°C), does not contain suspended solids, and does not have a tendency to form a surface film while under test, the procedure specified in the Standard Method of Test for Flashpoint by Tag Closed Tester (ASTM D-56-70) shall be used.

(b) For a liquid which has a viscosity of 45 SUS or more at 100°F (37.8°C), or contains suspended solids, or has a tendency to form a surface film while under test, the Standard Method of Test for Flashpoint by Pensky-Martens Closed Tester (ASTM D-93-71) shall be used, except that the methods specified in Note 1 to section 1.1 of ASTM D-93-71 may be used for the respective materials specified in the note.

(c) For a liquid that is a mixture of compounds that have different volatilities and flashpoints, its flashpoint shall be determined by using the procedure specified in (a) or (b) of this subsection on the liquid in the form it is shipped. If the flashpoint, as determined by this test, is 100°F (37.8°C) or higher, an additional flashpoint determination shall be run on a sample of the liquid evaporated to ninety percent of its original volume, and the lower value of the two tests shall be considered the flashpoint of the material.

(d) Organic peroxides, which undergo autoaccelerating thermal decomposition, are excluded from any of the

flashpoint determination methods specified in this section.

(16) Hotel shall mean buildings or groups of buildings under the same management in which there are sleeping accommodations for hire primarily used by transients who are lodged with or without meals including but not limited to inns, clubs, motels, and apartment hotels.

(17) Institutional occupancy shall mean the occupancy or use of a building or structure or any portion thereof by persons harbored or detained to receive medical, charitable or other care or treatment, or by persons involuntarily detained.

(18) Liquid shall mean, for the purpose of these standards, any material which has a fluidity greater than that of 300 penetration asphalt when tested in accordance with ASTM Test for Penetration for Bituminous Materials, D-5-65. When not otherwise identified, the term liquid shall include both flammable and combustible liquids.

(19) "Combustible liquid" means any liquid having a flashpoint at or above 100°F (37.8°C). Combustible liquids shall be divided into two classes as follows:

(a) "Class II liquids" shall include those with flashpoints at or above 100°F (37.8°C) and below 140°F (60°C), except any mixture having components with flashpoints of 200°F (93.3°C) or higher, the volume of which make up ninety-nine percent or more of the total volume of the mixture.

(b) "Class III liquids" shall include those with flashpoints at or above 140°F (60°C). Class III liquids are subdivided into two subclasses:

(i) "Class IIIA liquids" shall include those with flashpoints at or above 140°F (60°C) and below 200°F (93.3°C) except any mixture having components with flashpoints of 200°F (93.3°C) or higher, the total volume of which make up ninety-nine percent or more of the total volume of the mixture.

(ii) "Class IIIB liquids" shall include those with flashpoints at or above 200°F (93.3°C). This section does not cover Class IIIB liquids. Where the term "Class III liquids" is used in this section, it shall mean only Class IIIA liquids.

(c) When a combustible liquid is heated for use to within 30°F (16.7°C) of its flashpoint, it shall be handled in accordance with the requirements for the next lower class of liquids.

(20) "Flammable liquid" means any liquid having a flashpoint below 100°F (37.8°C), except any mixture having components with flashpoints of 100°F (37.8°C), or higher, the total of which make up ninety-nine percent or more of the total volume of the mixture. Flammable liquids shall be known as Class I liquids. Class I liquids are divided into three classes as follows:

(a) Class IA shall include liquids having flashpoints below 73°F (22.8°C) and having a boiling point below 100°F (37.8°C).

(b) Class IB shall include liquids having flashpoints below 73°F (22.8°C) and having a boiling point at or above 100°F (37.8°C).

(c) Class IC shall include liquids having flashpoints at or above 73°F (22.8°C) and below 100°F (37.8°C).

(21) Unstable (reactive) liquid shall mean a liquid which in the pure state or as commercially produced or transported will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure, or temperature.

(22) Low-pressure tank shall mean a storage tank which has been designed to operate at pressures above 0.5 p.s.i.g. but not more than 15 p.s.i.g.

(23) Marine service station shall mean that portion of a property where flammable or combustible liquids used as fuels are stored and dispensed from fixed equipment on shore, piers, wharves, or floating docks into the fuel tanks or self-propelled craft, and shall include all facilities used in connection therewith.

(24) Mercantile occupancy shall mean the occupancy or use of a building or structure or any portion thereof for the displaying, selling, or buying of goods, wares, or merchandise.

(25) Office occupancy shall mean the occupancy or use of a building or structure or any portion thereof for the transaction of business, or the rendering or receiving of professional services.

(26) Portable tank shall mean a closed container having a liquid capacity over sixty United States gallons and not intended for fixed installation.

(27) Pressure vessel shall mean a storage tank or vessel which has been designed to operate at pressures above 15 p.s.i.g.

(28) Protection for exposure shall mean adequate fire protection for structures on property adjacent to tanks, where there are employees of the establishment.

(29) Refinery shall mean a plant in which flammable or combustible liquids are produced on a commercial scale from crude petroleum, natural gasoline, or other hydrocarbon sources.

(30) Safety can shall mean an approved container, of not more than five gallons capacity, having a spring-closing lid and spout cover and so designed that it will safely relieve internal pressure when subjected to fire exposure.

(31) Vapor pressure shall mean the pressure, measured in pounds per square inch (absolute) exerted by a volatile liquid as determined by the "Standard Method of Test for Vapor Pressure of Petroleum Products (Reid Method)," American Society for Testing and Materials ASTM D323-68.

(32) Ventilation as specified in these standards is for the prevention of fire and explosion. It is considered adequate if it is sufficient to prevent accumulation of significant quantities of vapor-air mixtures in concentration over one-fourth of the lower flammable limit.

(33) Storage: Flammable or combustible liquids shall be stored in a tank or in a container that complies with WAC 296-24-33009(2).

(34) Barrel shall mean a volume of forty-two United States gallons.

(35) Container shall mean any can, barrel, or drum.

(36) Approved unless otherwise indicated, approved, or listed by a nationally recognized testing laboratory.

Refer to federal regulation 29 CFR 1910.7 for definition of nationally recognized testing laboratory.

(37) Listed see subsection (36) of this section.

(38) "SUS" means Saybolt Universal Seconds as determined by the Standard Method of Test for Saybolt Viscosity (ASTM D-88-56), and may be determined by use of the SUS conversion tables specified in ASTM Method D2161-66 following determination of viscosity in accordance with the procedures specified in the Standard Method of Test for Viscosity of Transparent and Opaque Liquids (ASTM D445-65).

(39) "Viscous" means a viscosity of 45 SUS or more.

Note: The volatility of liquids is increased when artificially heated to temperatures equal to or higher than their flashpoints. When so heated Class II and III liquids shall be subject to the applicable requirements for Class I or II liquids. These standards may also be applied to high flashpoint liquids when so heated even though these same liquids when not heated are outside of its scope.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-33001, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 82-08-026 (Order 82-10), § 296-24-33001, filed 3/30/82. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-24-33001, filed 11/13/80; Order 76-29, § 296-24-33001, filed 9/30/76; Order 76-6, § 296-24-33001, filed 3/1/76; Order 74-27, § 296-24-33001, filed 5/7/74; Order 73-5, § 296-24-33001, filed 5/9/73 and Order 73-4, § 296-24-33001, filed 5/7/73.]

WAC 296-24-33005 Tank storage. (1) Design and construction of tanks.

(a) Materials.

(i) Tanks shall be built of steel except as provided in (1)(a)(ii) through (v) of this section.

(ii) Tanks may be built of materials other than steel for installation underground or if required by the properties of the liquid stored. Tanks located above ground or inside buildings shall be of noncombustible construction.

(iii) Tanks built of materials other than steel shall be designed to specifications embodying principles recognized as good engineering design for the material used.

(iv) Unlined concrete tanks may be used for storing flammable or combustible liquids having a gravity of 40°API or heavier. Concrete tanks with special lining may be used for other services provided the design is in accordance with sound engineering practice.

(v) Tanks may have combustible or noncombustible linings.

(vi) Special engineering consideration shall be required if the specific gravity of the liquid to be stored exceeds that of water or if the tanks are designed to contain flammable or combustible liquids at a liquid temperature below 0°F.

(b) Fabrication.

(i) Tanks may be of any shape or type consistent with sound engineering design.

(ii) Metal tanks shall be welded, riveted, and caulked, brazed, or bolted, or constructed by use of a combination of these methods. Filler metal used in brazing shall be nonferrous metal or an alloy having a melting point above 1000°F and below that of the metal joined.

(c) Atmospheric tanks.

(i) Atmospheric tanks shall be built in accordance with acceptable good standards of design. Atmospheric tanks may be built in accordance with:

(A) Underwriters' Laboratories, Inc., Subjects No. 142, Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids, 1968; No. 58, Standards for Steel Underground Tanks for Flammable and COMBUSTIBLE Liquids, Fifth Edition, December 1961; or No. 80, Standard for Steel Inside Tanks for Oil-Burner Fuel, September 1963.

(B) American Petroleum Institute Standards No. 12A, Specification for Oil Storage Tanks with Riveted Shells, Seventh Edition, September 1951, or No. 650, Welded Steel Tanks for Oil Storage, Third Edition, 1966.

(C) American Petroleum Institute Standards No. 12B, Specification for Bolted Production Tanks, Eleventh Edition, May 1958, and Supplement 1, March 1962; No. 12D, Specification for Large Welded Production Tanks, Seventh Edition, August 1957; or No. 12F, Specification for Small Welded Production Tanks, Fifth Edition, March 1961. Tanks built in accordance with these standards shall be used only as production tanks for storage of crude petroleum in oil-producing areas.

(ii) Tanks designed for underground service not exceeding 2,500 gallons capacity may be used aboveground.

(iii) Low-pressure tanks and pressure vessels may be used as atmospheric tanks.

(iv) Atmospheric tanks shall not be used for the storage of a flammable or combustible liquid at a temperature at or above its boiling point.

(d) Low pressure tanks.

(i) The normal operating pressure of the tank shall not exceed the design pressure of the tank.

(ii) Low-pressure tanks shall be built in accordance with acceptable standards of design. Low-pressure tanks may be built in accordance with:

(A) American Petroleum Institute Standard No. 620, Recommended Rules for the Design and Construction of Large, Welded, Low-Pressure Storage Tanks, Third Edition, 1966.

(B) The principles of the Code for Unfired Pressure Vessels, Section VIII of the ASME Boiler and Pressure Vessels Code, 1968.

(iii) Atmospheric tanks built according to the Underwriters' Laboratories, Inc., requirements in (1)(c)(i) of this section may be used for operating pressures not exceeding 1 p.s.i.g. and shall be limited to 2.5 p.s.i.g. under emergency venting conditions. Pressure vessels may be used as low-pressure tanks.

(e) Pressure vessels.

(i) The normal operating pressure of the vessel shall not exceed the design pressure of the vessel.

(ii) Pressure vessels shall be built in accordance with the Code for Unfired Pressure Vessels, Section VIII of the ASME Boiler and Pressure Vessel Code, 1968.

(f) Provisions for internal corrosion. When tanks are not designed in accordance with the American Petroleum Institute, American Society of Mechanical Engineers, or the Underwriters' Laboratories, Inc.'s

standards, or if corrosion is anticipated beyond that provided for in the design formulas used, additional metal thickness or suitable protective coatings or linings shall be provided to compensate for the corrosion loss expected during the design life of the tank.

(2) Installation of outside aboveground tanks.

(a) Location with respect to property lines and public ways.

(i) Every aboveground tank for the storage of flammable or combustible liquids, except those liquids with boil-over characteristics and unstable liquids, operating at pressures not in excess of 2.5 p.s.i.g. and equipped with emergency venting which will not permit pressures to exceed 2.5 p.s.i.g. shall be located in accordance with Table H-5.

(ii) Every aboveground tank for the storage of flammable or combustible liquids, except those liquids with boil-over characteristics and unstable flammable or combustible liquids, operating at pressures exceeding 2.5 p.s.i.g. or equipped with emergency venting which will permit pressures to exceed 2.5 p.s.i.g. shall be located in accordance with Table H-6.

TABLE H-5

Type of tank	Protection	Minimum distance in feet from property line which may be built upon, including the opposite side of a public way.	Minimum distance in feet from nearest side of any public way or from nearest important building and shall be not less than 5 feet.
Floating roof	Protection for exposures.	1/2 times diameter of tank but need not exceed 90 ft.	1/6 times diameter of tank but need not exceed 30 ft.
	None	Diameter of tank but need not exceed 175 ft.	1/6 times diameter of tank but need not exceed 30 ft.
Vertical and weak roof to shell seam	Approved foam or inerting system on the tank.	1/2 times diameter of tank but need not exceed 90 ft. and shall not be less than 5 ft.	1/6 times diameter of tank but need not exceed 30 ft.
	Protection for exposures.	Diameter of tank but, need not exceed 175 ft.	1/3 times diameter of tank but need not exceed 60 ft.
	None	2 times diameter of tank but need not exceed 350 ft.	1/3 times diameter of tank but need not exceed 60 ft.
Horizontal and vertical, with emergency relief venting to limit pressures to 2.5 p.s.i.g.	Approved inerting system on the tank or approved foam system on vertical tanks.	1/2 times Table H-9 but shall not be less than 5 ft.	1/2 times Table H-9.
	Protection for exposures.	Table H-9	Table H-9
	None	2 times table	Table H-9

TABLE H-6

Type of tank	Protection	Minimum distance in feet from property line which may be built upon, including the opposite side of a public way.	Minimum distance in feet from nearest side of any public way or from nearest important building.
Any type	Protection for exposures.	1 1/2 times Table H-9 but shall not be less than 25 ft.	1 1/2 times Table H-9 but shall not be less than 25 ft.
	None	3 times Table H-9 but shall not be less than 50 ft.	1 1/2 times Table H-9 but shall not be less than 25 ft.

(iii) Every aboveground tank for the storage of flammable or combustible liquids with boil-over characteristics shall be located in accordance with Table H-7.

TABLE H-7

Type of tank	Protection	Minimum distance in feet from property line which may be built upon, including the opposite side of a public way.	Minimum distance in feet from nearest side of any public way or from nearest important building.
Floating roof	Protection for exposures.	Diameter of tank but need not exceed 175 ft.	1/3 times diameter of tank but need not exceed 60 ft.
	None	2 times diameter of tank but need not exceed 350 ft.	1/3 times diameter of tank but need not exceed 60 ft.
Fixed roof	Approved foam or inerting system.	Diameter of tank but need not exceed 175 ft.	1/3 times diameter of tank but need not exceed 60 ft.
	Protection for exposures.	2 times diameter of tank but need not exceed 350 ft.	2/3 times diameter of tank but need not exceed 120 ft.
	None	4 times diameter of tank but need not exceed 350 ft.	2/3 times diameter of tank but need not exceed 120 ft.

(iv) Every aboveground tank for the storage of unstable liquids shall be located in accordance with Table H-8.

TABLE H-8

Type of tank	Protection	Minimum distance in feet from property line which may be built upon, including the opposite side of a public way.	Minimum distance in feet from nearest side of any public way or from nearest important building.
Horizontal and vertical tanks with emergency relief venting to permit pressure not in excess of 2.5 p.s.i.g.	Tank protected with any of the following: Approved water spray, approved inerting, approved insulation and refrigeration, approved barricade.	See Table H-9, but the distance may be not less than 25 ft.	Not less than 25 ft.

	Protection for exposures.	2 1/2 times Table H-9 but not less than 50 ft.	Not less than 50 ft.
	None	5 times Table H-9 but not less than 100 ft.	Not less than 100 ft.
Horizontal and vertical tanks with emergency relief venting to permit pressure over 2.5 p.s.i.g.	Tank protected with any one of the following: Approved water spray, approved inerting, approved insulation and refrigeration, approved barricade.	2 times Table H-9 but not less than 50 ft.	Not less than 50 ft.
	Protection for exposures.	4 times Table H-9 but not less than 100 ft.	Not less than 100 ft.
	None	8 times Table H-9 but not less than 150 ft.	Not less than 150 ft.

(v) Reference minimum distances for use in Tables H-5 to H-8 inclusive.

TABLE H-9

Capacity tank gallons	Minimum distance in feet from property line which may be built upon, including the opposite side of a public way.	Minimum distance in feet from nearest side of any public way or from nearest important building.
275 or less	5	5
276 to 750	10	5
751 to 12,000	15	5
12,001 to 30,000	20	5
30,001 to 50,000	30	10
50,001 to 100,000	50	15
100,001 to 500,000	80	25
500,001 to 1,000,000	100	35
1,000,001 to 2,000,000	135	45
2,000,001 to 3,000,000	165	55
3,000,001 or more	175	60

(vi) Where end failure or horizontal pressure tanks and vessels may expose property, the tank shall be placed with the longitudinal axis parallel to the nearest important exposure.

(b) Spacing (shell-to-shell) between aboveground tanks.

(i) The distance between any two flammable or combustible liquid storage tanks shall not be less than 3 feet.

(ii) Except as provided in (2)(b)(iii) of this section, the distance between any two adjacent tanks shall not be less than one-sixth the sum of their diameters. When the diameter of one tank is less than one-half the diameter of the adjacent tank, the distance between the two tanks shall not be less than one-half the diameter of the smaller tank.

(iii) Where crude petroleum in conjunction with production facilities are located in noncongested areas and have capacities not exceeding 126,000 gallons (3,000 barrels), the distance between such tanks shall not be less than 3 feet.

(iv) Where unstable flammable or combustible liquids are stored, the distance between such tanks shall not be less than one-half the sum of their diameters.

(v) When tanks are compacted in three or more rows or in an irregular pattern, greater spacing or other means shall be provided so that inside tanks are accessible for firefighting purposes.

(vi) The minimum separation between a liquefied petroleum gas container and a flammable or combustible liquid storage tank shall be 20 feet, except in the case of flammable or combustible liquid tanks operating at pressures exceeding 2.5 p.s.i.g. or equipped with emergency venting which will permit pressures to exceed 2.5 p.s.i.g. in which case the provisions of (2)(b)(i) and (ii) of this section shall apply. Suitable means shall be taken to prevent the accumulation of flammable or combustible liquids under adjacent liquefied petroleum gas containers such as by diversion curbs or grading. When flammable or combustible liquid storage tanks are within a diked area, the liquefied petroleum gas containers shall be outside the diked area and at least 10 feet away from the centerline of the wall of the diked area. The foregoing provisions shall not apply when liquefied petroleum gas containers of 125 gallons or less capacity are installed adjacent to fuel oil supply tanks of 550 gallons or less capacity.

(c) Location of outside aboveground tanks with respect to important buildings on same property. Every outside aboveground tank shall be separated from important buildings on the same property by distances not less than those specified in (2)(a)(i), (ii), (iii) and (iv) of this section, whichever is applicable. The appropriate distance column in Tables H-5, H-6, H-7, H-8, or H-9, that shall be used shall be the one reading: "Minimum distance in feet from nearest side of any public way or from nearest important building."

(d) Normal venting for aboveground tanks. (i) Atmospheric storage tanks shall be adequately vented to prevent the development of vacuum or pressure sufficient to distort the roof of a cone roof tank or exceed the design pressure in the case of other atmospheric tanks, as a result of filling or emptying, and atmospheric temperature changes.

(ii) Normal vents shall be sized either in accordance with: (A) The American Petroleum Institute Standard 2000 (1968), Venting Atmospheric and Low-Pressure Storage Tanks; or (B), other accepted standard; or (C) shall be at least as large as the filling or withdrawal connection, whichever is larger but in no case less than 1 1/4 inch nominal inside diameter.

(iii) Low-pressure tanks and pressure vessels shall be adequately vented to prevent development of pressure or vacuum, as a result of filling or emptying and atmospheric temperature changes, from exceeding the design pressure of the tank or vessel. Protection shall also be

provided to prevent over-pressure from any pump discharging into the tank or vessel when the pump discharge pressure can exceed the design pressure of the tank or vessel.

(iv) If any tank or pressure vessel has more than one fill or withdrawal connection and simultaneous filling or withdrawal can be made, the vent size shall be based on the maximum anticipated simultaneous flow.

(v) Unless the vent is designed to limit the internal pressure 2.5 p.s.i. or less, the outlet of vents and vent drains shall be arranged to discharge in such a manner as to prevent localized overheating of any part of the tank in the event vapors from such vents are ignited.

(vi) Tanks and pressure vessels storing Class IA liquids shall be equipped with venting devices which shall be normally closed except when venting to pressures or vacuum conditions. Tanks and pressure vessels storing Class IB and IC liquids shall be equipped with venting devices which shall be normally closed except when venting under pressure or vacuum conditions, or with approved flame arresters.

Exemption: Tanks of 3,000 bbls. capacity or less containing crude petroleum in crude-producing areas; and, outside above-ground atmospheric tanks under 1,000 gallons capacity containing other than Class IA flammable liquids may have open vents. (See (2)(f)(ii) of this section.)

(vii) Flame arresters or venting devices required in (2)(e)(vi) of this section may be omitted for Class IB and IC liquids where conditions are such that their use may, in case of obstruction, result in tank damage.

(e) Emergency relief venting for fire exposure for aboveground tanks.

(i) Every aboveground storage tank shall have some form of construction or device that will relieve excessive internal pressure caused by exposure fires.

(ii) In a vertical tank the construction referred to in (2)(e)(i) of this section may take the form of a floating roof, lifter roof, a weak roof-to-shell seam, or other approved pressure relieving construction. The weak roof-to-shell seam shall be constructed to fail preferential to any other seam.

(iii) Where entire dependence for emergency relief is placed upon pressure relieving devices, the total venting capacity of both normal and emergency vents shall be enough to prevent rupture of the shell or bottom of the tank if vertical, or of the shell or heads if horizontal. If unstable liquids are stored, the effects of heat or gas resulting from polymerization, decomposition, condensation, or self-reactivity shall be taken into account. The total capacity of both normal and emergency venting devices shall be not less than that derived from Table H-10 except as provided in (2)(e)(v) and (vi) of this section. Such device may be a self-closing manhole cover, or one using long bolts that permit the cover to lift under internal pressure, or an additional or larger relief valve or valves. The wetted area of the tank shall be calculated on the basis of 55 percent of the total exposed area of a sphere or spheroid, 75 percent of the total exposed area of a horizontal tank and the first 30 feet above grade of the exposed shell area of a vertical tank.

TABLE 10

WETTED AREA VERSUS CUBIC FEET
FREE AIR PER HOUR
(14.7 psia and 60°F)

Square feet	CFH	Square feet	CFH	Square feet	CFH
20	21,100	200	211,000	1,000	524,000
30	31,600	250	239,000	1,200	557,000
40	42,100	300	265,000	1,400	587,000
50	52,700	350	288,000	1,600	614,000
60	63,200	400	312,000	1,800	639,000
70	73,700	500	354,000	2,000	662,000
80	84,200	600	392,000	2,400	704,000
90	94,800	700	428,000	2,800	742,000
100	105,000	800	462,000	and	
120	126,000	900	493,000	over	
140	147,000	1,000	524,000		
160	168,000				
180	190,000				
200	211,000				

(iv) For tanks and storage vessels designed for pressure over 1 p.s.i.g., the total rate of venting shall be determined in accordance with Table H-10, except that when the exposed wetted area of the surface is greater than 2,800 square feet, the total rate of venting shall be calculated by the following formula:

$$CFH = 1,107A^{0.82}$$

Where:

CFH = Venting requirement, in cubic feet of free air per hour.

A = Exposed wetted surface, in square feet.

Note: The foregoing formula is based on $Q = 21,000A^{0.82}$.

(v) The total emergency relief venting capacity for any specific stable liquid may be determined by the following formula:

Cubic feet of free air per hour = V

$$V = \frac{1337}{LM}$$

V = Cubic feet of free air per hour from Table H-10.

L = Latent heat of vaporization of specific liquid in B.t.u. per pound.

M = Molecular weight of specific liquids.

(vi) The required airflow rate of (2)(e)(iii) or (v) of this section may be multiplied by the appropriate factor listed in the following schedule when protection is provided as indicated. Only one factor may be used for any one tank.

0.5 for drainage in accordance with (2)(g)(ii) of this section for tanks over 200 square feet of wetted area.

0.3 for approved water spray.

0.3 for approved insulation.

0.15 for approved water spray with approved insulation.

(vii) The outlet of all vents and vent drains on tanks equipped with emergency venting to permit pressures exceeding 2.5 p.s.i.g. shall be arranged to discharge in such a way as to prevent localized overheating of any part of the tank, in the event vapors from such vents are ignited.

(viii) Each commercial tank venting device shall have stamped on it the opening pressure, the pressure at which the valve reaches the full open position, and the flow capacity at the latter pressure, expressed in cubic feet per hour of air at 60°F and at a pressure of 14.7 p.s.i.a.

(ix) The flow capacity of tank venting devices 12 inches and smaller in nominal pipe size shall be determined by actual test of each type and size of vent. These flow tests may be conducted by the manufacturer if certified by a qualified impartial observer, or may be conducted by an outside agency. The flow capacity of tank venting devices larger than 12 inches nominal pipe size, including manhole covers with long bolts or equivalent, may be calculated provided that the opening pressure is actually measured, the rating pressure and corresponding free orifice area are stated, the word "calculated" appears on the nameplate, and the computation is based on a flow coefficient of 0.5 applied to the rated orifice area.

(f) Vent piping for aboveground tanks.

(i) Vent piping shall be constructed in accordance with WAC 296-24-33007 of this section.

(ii) Where vent pipe outlets for tanks storing Class I liquids are adjacent to buildings or public ways, they shall be located so that the vapors are released at a safe point outside of buildings and not less than 12 feet above the adjacent ground level. In order to aid their dispersion, vapors shall be discharged upward or horizontally away from closely adjacent walls. Vent outlets shall be located so that flammable vapors will not be trapped by eaves or other obstructions and shall be at least five feet from building openings.

(iii) When tank vent piping is manifolded, pipe sizes shall be such as to discharge within the pressure limitations of the system, the vapors they may be required to handle when manifolded tanks are subject to the same fire exposure.

(g) Drainage, dikes, and walls for aboveground tanks.

(i) Drainage and diked areas. The area surrounding a tank or a group of tanks shall be provided with drainage as in (2)(g)(ii) of this section, or shall be diked as provided in (2)(g)(iii), to prevent accidental discharge of liquid from endangering adjoining property or reaching waterways.

(ii) Drainage. Where protection of adjoining property or waterways is by means of a natural or manmade drainage system, such systems shall comply with the following:

(A) A slope of not less than 1 percent away from the tank toward the drainage system shall be provided.

(B) The drainage system shall terminate in vacant land or other area or in an impounding basin having a capacity not smaller than that of the largest tank served.

This termination area and the route of the drainage system shall be so located that, if the flammable or combustible liquids in the drainage system are ignited, the fire will not seriously expose tanks or adjoining property.

(C) The drainage system, including automatic drainage pumps, shall not discharge to adjoining property, natural water courses, public sewers, or public drains unless the discharge of flammable or combustible liquids would not constitute a hazard, or the system is so designed that it will not permit flammable or combustible liquids to be released.

(iii) Diked areas. Where protection of adjoining property or waterways is accomplished by retaining the liquid around the tank by means of a dike, the volume of the diked area shall comply with the following requirements:

(A) Except as provided in (2)(g)(iii)(B) of this section, the volumetric capacity of the diked area shall not be less than the greatest amount of liquid that can be released from the largest tank within the diked area, assuming a full tank. The capacity of the diked area enclosing more than one tank shall be calculated by deducting the volume of the tanks other than the largest tank below the height of the dike.

(B) For a tank or group of tanks with fixed roofs containing crude petroleum with boilover characteristics, the volumetric capacity of the diked area shall be not less than the capacity of the largest tank served by the enclosure, assuming a full tank. The capacity of the diked enclosure shall be calculated by deducting the volume below the height of the dike of all tanks within the enclosure.

(C) Walls of the diked area shall be of earth, steel, concrete or solid masonry designed to be liquidtight and to withstand a full hydrostatic head. Earthen walls 3 feet or more in height shall have a flat section at the top not less than 2 feet wide. The slope of an earthen wall shall be consistent with the angle of repose of the material of which the wall is constructed.

(D) The walls of the diked area shall be restricted to an average height of 6 feet above interior grade.

(E) Where provision is made for draining water from diked areas, drainage shall be provided at a uniform slope of not less than 1 percent away from tanks toward a sump, drainbox, or other safe means of disposal located at the greatest practical distance from the tank. Such drains shall normally be controlled in a manner so as to prevent flammable or combustible liquids from entering natural water courses, public sewers, or public drains, if their presence would constitute a hazard. Control of drainage shall be accessible under fire conditions.

(F) No loose combustible material, empty or full drum or barrel, shall be permitted within the diked area.

(G) Each diked area containing two or more tanks shall be subdivided preferably by drainage channels or at least by intermediate curbs in order to prevent spills from endangering adjacent tanks within the diked area as follows:

(I) When storing normally stable liquids in vertical cone roof tanks constructed with weak roof-to-shell seam or approved floating roof tanks or when storing

crude petroleum in producing areas in any type of tank, one subdivision for each tank in excess of 10,000 bbls. and one subdivision for each group of tanks (no tank exceeding 10,000 bbls. capacity) having an aggregate capacity not exceeding 15,000 bbls.

(II) When storing normally stable flammable or combustible liquids in tanks not covered in (g)(iii)(G)(I) of this subsection, one subdivision for each tank in excess of 100,000 gallons (2,500 bbls.) and one subdivision for each group of tanks (no tank exceeding 100,000 gallons capacity) having an aggregate capacity not exceeding 150,000 gallons (3,570 bbls.).

(III) When storing unstable liquids in any type of tank, one subdivision for each tank except that tanks installed in accordance with the drainage requirements of NFPA 15-1969, Standard for Water Spray Fixed Systems for Fire Protection shall require no additional subdivision.

(IV) The drainage channels or intermediate curbs shall be located between tanks so as to take full advantage of the available space with due regard for the individual tank capacities. Intermediate curbs, where used, shall be not less than 18 inches in height.

(h) Tank openings other than vents for aboveground tanks.

(i) Connections for all tank openings shall be vapor-tight and liquid tight. Vents are covered in (2)(d) through (f) of this section.

(ii) Each connection to an aboveground tank through which liquid can normally flow shall be provided with an internal or an external valve located as close as practical to the shell of the tank. Such valves, when external, and their connections to the tank shall be of steel except when the chemical characteristics of the liquid stored are incompatible with steel. When materials other than steel are necessary, they shall be suitable for the pressures, structural stresses, and temperatures involved, including fire exposures.

(iii) Each connection below the liquid level through which liquid does not normally flow shall be provided with a liquid tight closure. This may be a valve, plug, or blind, or a combination of these.

(iv) Openings for gaging shall be provided with a vapor tight cap or cover.

(v) For Class IB and Class IC liquids other than crude oils, gasolines, and asphalts, the fill pipe shall be so designed and installed as to minimize the possibility of generating static electricity. A fill pipe entering the top of a tank shall terminate within 6 inches of the bottom of the tank and shall be installed to avoid excessive vibration.

(vi) Filling and emptying connections which are made and broken shall be located outside of buildings at a location free from any source of ignition and not less than 5 feet away from any building opening. Such connection shall be closed and liquidtight when not in use. The connection shall be properly identified.

(3) Installation of underground tanks.

(a) Location. Excavation for underground storage tanks shall be made with due care to avoid undermining

of foundations of existing structures. Underground tanks or tanks under buildings shall be so located with respect to existing building foundations and supports that the loads carried by the latter cannot be transmitted to the tank. The distance from any part of a tank storing Class I liquids to the nearest wall of any basement or pit shall be not less than 1 foot, and to any property line that may be built upon, not less than 3 feet. The distance from any part of a tank storing Class II or Class III liquids to the nearest wall of any basement, pit or property line shall not be less than 1 foot.

(b) Depth and cover. Underground tanks shall be set on firm foundations and surrounded with at least 6 inches of noncorrosive, inert materials such as clean sand, earth, or gravel well tamped in place. The tank shall be placed in the hole with care since dropping or rolling the tank into the hole can break a weld, puncture or damage the tank, or scrape off the protective coating of coated tanks. Tanks shall be covered with a minimum of 2 feet of earth or shall be covered with not less than 1 foot of earth, on top of which shall be placed a slab of reinforced concrete not less than 4 inches thick. When underground tanks are, or are likely to be, subject to traffic, they shall be protected against damage from vehicles passing over them by at least 3 feet of earth cover, or 18 inches of well-tamped earth, plus 6 inches of reinforced concrete or 8 inches of asphaltic concrete. When asphaltic or reinforced concrete paving is used as part of the protection, it shall extend at least 1 foot horizontally beyond the outline of the tank in all directions.

(c) Corrosion protection. Corrosion protection for the tank and its piping shall be provided by one or more of the following methods:

- (i) Use of protective coatings or wrappings;
 - (ii) Cathodic protection; or,
 - (iii) Corrosion resistant materials of construction.
- (d) Vents.

(i) Location and arrangement of vents for Class I liquids. Vent pipes from tanks storing Class I liquids shall be so located that the discharge point is outside of buildings, higher than the fill pipe opening, and not less than 12 feet above the adjacent ground level. Vent pipes shall discharge only upward in order to disperse vapors. Vent pipes 2 inches or less in nominal inside diameter shall not be obstructed by devices that will cause excessive back pressure. Vent pipe outlets shall be so located that flammable vapors will not enter building openings, or be trapped under eaves or other obstructions. If the vent pipe is less than 10 feet in length, or greater than 2 inches in nominal inside diameter, the outlet shall be provided with a vacuum and pressure relief device or there shall be an approved flame arrester located in the vent line at the outlet or within the approved distance from the outlet.

(ii) Size of vents. Each tank shall be vented through piping adequate in size to prevent blow-back of vapor or liquid at the fill opening while the tank is being filled. Vent pipes shall be not less than 1 1/4 inch nominal inside diameter.

TABLE H-11
VENT LINE DIAMETERS

Maximum flow GPM	Pipe length*		
	50 feet	100 feet	200 feet
	Inches	Inches	Inches
100	1 1/4	1 1/4	1 1/4
200	1 1/4	1 1/4	1 1/4
300	1 1/4	1 1/4	1 1/2
400	1 1/4	1 1/2	2
500	1 1/2	1 1/2	2
600	1 1/2	2	2
700	2	2	2
800	2	2	3
900	2	2	3
1,000	2	2	3

*Vent lines of 50 ft., 100 ft., and 200 ft. of pipe plus 7 ells.

(iii) Location and arrangement of vents for Class II or Class III liquids. Vent pipes from tanks storing Class II or Class III flammable liquids shall terminate outside of the building and higher than the fill pipe opening. Vent outlets shall be above normal snow level. They may be fitted with return bends, coarse screens or other devices to minimize ingress of foreign material.

(iv) Vent piping shall be constructed in accordance with WAC 296-24-33007. Vent pipes shall be so laid as to drain toward the tank without sags or traps in which liquid can collect. They shall be located so that they will not be subjected to physical damage. The tank end of the vent pipe shall enter the tank through the top.

(v) When tank vent piping is manifolded, pipe sizes shall be such as to discharge, within the pressure limitations of the system, the vapors they may be required to handle when manifolded tanks are filled simultaneously.

(e) Tank openings other than vents.

(i) Connections for all tank openings shall be vapor or liquid tight.

(ii) Openings for manual gaging, if independent of the fill pipe, shall be provided with a liquid-tight cap or cover. If inside a building, each such opening shall be protected against liquid overflow and possible vapor release by means of a spring loaded check valve or other approved device.

(iii) Fill and discharge lines shall enter tanks only through the top. Fill lines shall be sloped toward the tank.

(iv) For Class IB and Class IC liquids other than crude oils, gasolines, and asphalts, the fill pipe shall be so designed and installed as to minimize the possibility of generating static electricity by terminating within 6 inches of the bottom of the tank.

(v) Filling and emptying connections which are made and broken shall be located outside of buildings at a location free from any source of ignition and not less than 5 feet away from any building opening. Such connection shall be closed and liquid-tight when not in use. The connection shall be properly identified.

(4) Installation of tanks inside of buildings.

(a) Location. Tanks shall not be permitted inside of buildings except as provided in WAC 296-24-33011 and 296-24-33015 through 296-24-33019.

(b) Vents. Vents for tanks inside of buildings shall be as provided in (2)(d), (e), (f)(ii) and (3)(d) of this section, except that emergency venting by the use of weak roof seams on tanks shall not be permitted. Vents shall discharge vapors outside the buildings.

(c) Vent piping. Vent piping shall be constructed in accordance with WAC 296-24-33007.

(d) Tank openings other than vents.

(i) Connections for all tank openings shall be vapor or liquidtight. Vents are covered in (4)(b) of this section.

(ii) Each connection to a tank inside of buildings through which liquid can normally flow shall be provided with an internal or an external valve located as close as practical to the shell of the tank. Such valves, when external, and their connections to the tank shall be of steel except when the chemical characteristics of the liquid stored are incompatible with steel. When materials other than steel are necessary, they shall be suitable for the pressures, structural stresses, and temperatures involved, including fire exposures.

(iii) Flammable or combustible liquid tanks located inside of buildings, except in one-story buildings designed and protected for flammable or combustible liquid storage, shall be provided with an automatic-closing heat-actuated valve on each withdrawal connection below the liquid level, except for connections used for emergency disposal, to prevent continued flow in the event of fire in the vicinity of the tank. This function may be incorporated in the valve required in (4)(d)(ii) of this section, and if a separate valve, shall be located adjacent to the valve required in (4)(d)(ii) of this section.

(iv) Openings for manual gaging, if independent of the fill pipe (see (4)(d)(vi) of this section), shall be provided with a vaportight cap or cover. Each such opening shall be protected against liquid overflow and possible vapor release by means of a spring loaded check valve or other approved device.

(v) For Class IB and Class IC liquids other than crude oils, gasolines, and asphalts, the fill pipe shall be so designed and installed as to minimize the possibility of generating static electricity by terminating within 6 inches of the bottom of the tank.

(vi) The fill pipe inside of the tank shall be installed to avoid excessive vibration of the pipe.

(vii) The inlet of the fill pipe shall be located outside of buildings at a location free from any source of ignition and not less than 5 feet away from any building opening. The inlet of the fill pipe shall be closed and liquidtight when not in use. The fill connection shall be properly identified.

(viii) Tanks inside buildings shall be equipped with a device, or other means shall be provided, to prevent overflow into the building.

(5) Supports, foundations, and anchorage for all tank locations.

(a) General. Tank supports shall be installed on firm foundations. Tank supports shall be of concrete, masonry, or protected steel. Single wood timber supports (not cribbing) laid horizontally may be used for outside aboveground tanks if not more than 12 inches high at their lowest point.

(b) Fire resistance. Steel supports or exposed piling shall be protected by materials having a fire resistance rating of not less than 2 hours, except that steel saddles need not be protected if less than 12 inches high at their lowest point. Water spray protection or its equivalent may be used in lieu of fire-resistive materials to protect supports.

(c) Spheres. The design of the supporting structure for tanks such as spheres shall receive special engineering consideration.

(d) Load distribution. Every tank shall be so supported as to prevent the excessive concentration of loads on the supporting portion of the shell.

(e) Foundations. Tanks shall rest on the ground or on foundations made of concrete, masonry, piling, or steel. Tank foundations shall be designed to minimize the possibility of uneven settling of the tank and to minimize corrosion in any part of the tank resting on the foundation.

(f) Flood areas. Where a tank is located in an area that may be subjected to flooding, the applicable precautions outlined in (5)(f) of this section shall be observed.

(i) No aboveground vertical storage tank containing a flammable or combustible liquid shall be located so that the allowable liquid level within the tank is below the established maximum flood stage, unless the tank is provided with a guiding structure such as described in (5)(f)(xiii), (xiv) and (xv) of this section.

(ii) Independent water supply facilities shall be provided at locations where there is no ample and dependable public water supply available for loading partially empty tanks with water.

(iii) In addition to the preceding requirements, each tank so located that more than 70 percent, but less than 100 percent, of its allowable liquid storage capacity will be submerged at the established maximum flood stage, shall be safeguarded by one of the following methods: Tank shall be raised, or its height shall be increased, until its top extends above the maximum flood stage a distance equivalent to 30 percent or more of its allowable liquid storage capacity: *Provided, however,* That the submerged part of the tank shall not exceed two and one-half times the diameter. Or, as an alternative to the foregoing, adequate noncombustible structural guides, designed to permit the tank to float vertically without loss of product, shall be provided.

(iv) Each horizontal tank so located that more than 70 percent of its storage capacity will be submerged at the established flood stage, shall be anchored, attached to a foundation of concrete or of steel and concrete, of sufficient weight to provide adequate load for the tank when filled with flammable or combustible liquid and submerged by flood waters to the established flood stage, or adequately secured by other means.

(v) Spherical and spheroidal tanks shall be protected by applicable methods as specified for either vertical or horizontal tanks.

(vi) At locations where there is no ample and dependable water supply, or where filling of underground tanks with liquid is impracticable because of the character of their contents, their use, or for other reasons, each tank shall be safeguarded against movement when empty and submerged by high ground water or flood waters by anchoring, weighting with concrete or other approved solid loading material, or securing by other means. Each such tank shall be so constructed and installed that it will safely resist external pressures due to high ground water or flood waters.

(vii) At locations where there is an ample and dependable water supply available, underground tanks containing flammable or combustible liquids, so installed that more than 70 percent of their storage capacity will be submerged at the maximum flood stage, shall be so anchored, weighted, or secured by other means, as to prevent movement of such tanks when filled with flammable or combustible liquids, and submerged by flood waters to the established flood stage.

(viii) Pipe connections below the allowable liquid level in a tank shall be provided with valves or cocks located as closely as practicable to the tank shell. Such valves and their connections to tanks shall be of steel or other material suitable for use with the liquid being stored. Cast iron shall not be used.

(ix) At locations where an independent water supply is required, it shall be entirely independent of public power and water supply. Independent source of water shall be available when flood waters reach a level not less than 10 feet below the bottom of the lowest tank on a property.

(x) The self-contained power and pumping unit shall be so located or so designed that pumping into tanks may be carried on continuously throughout the rise in flood waters from a level 10 feet below the lowest tank to the level of the potential flood stage.

(xi) Capacity of the pumping unit shall be such that the rate of rise of water in all tanks shall be equivalent to the established potential average rate of rise of flood waters at any stage.

(xii) Each independent pumping unit shall be tested periodically to insure that it is in satisfactory operating condition.

(xiii) Structural guides for holding floating tanks above their foundations shall be so designed that there will be no resistance to the free rise of a tank, and shall be constructed of noncombustible material.

(xiv) The strength of the structure shall be adequate to resist lateral movement of a tank subject to a horizontal force in any direction equivalent to not less than 25 pounds per square foot acting on the projected vertical cross-sectional area of the tank.

(xv) Where tanks are situated on exposed points or bends in a shoreline where swift currents in flood waters will be present, the structures shall be designed to withstand a unit force of not less than 50 pounds per square foot.

(xvi) The filling of a tank to be protected by water loading shall be started as soon as flood waters reach a dangerous flood stage. The rate of filling shall be at least equal to the rate of rise of the floodwaters (or the established average potential rate of rise).

(xvii) Sufficient fuel to operate the water pumps shall be available at all times to insure adequate power to fill all tankage with water.

(xviii) All valves on connecting pipelines shall be closed and locked in closed position when water loading has been completed.

(xix) Where structural guides are provided for the protection of floating tanks, all rigid connections between tanks and pipelines shall be disconnected and blanked off or banded before the floodwaters reach the bottom of the tank, unless control valves and their connections to the tank are of a type designed to prevent breakage between the valve and the tank shell.

(xx) All valves attached to tanks other than those used in connection with water loading operations shall be closed and locked.

(xxi) If a tank is equipped with a swing line, the swing pipe shall be raised to and secured at its highest position.

(xxii) Inspections. The director or his designated representative shall make periodic inspections of all plants where the storage of flammable or combustible liquids is such as to require compliance with the foregoing requirements, in order to assure the following:

(A) That all flammable or combustible liquid storage tanks are in compliance with these requirements and so maintained.

(B) That detailed printed instructions of what to do in flood emergencies are properly posted.

(C) That station operators and other employees depended upon to carry out such instructions are thoroughly informed as to the location and operation of such valves and other equipment necessary to effect these requirements.

(g) Earthquake areas. In areas subject to earthquakes, the tank supports and connections shall be designed to resist damage as a result of such shocks.

(6) Sources of ignition. In locations where flammable vapors may be present, precautions shall be taken to prevent ignition by eliminating or controlling sources of ignition. Sources of ignition may include open flames, lightning, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, and mechanical), spontaneous ignition, chemical and physical-chemical reactions, and radiant heat.

(7) Testing.

(a) General. All tanks, whether shop built or field erected, shall be strength tested before they are placed in service in accordance with the applicable sections of the code under which they were built. The American Society of Mechanical Engineers (ASME) code stamp, American Petroleum Institute (API) monogram, or the label of the Underwriters' Laboratories, Inc., on a tank shall be evidence of compliance with this strength test. Tanks not marked in accordance with the above codes shall be strength tested before they are placed in service in accordance with good engineering principles and reference

shall be made to the sections on testing in the codes listed in (l)(c)(i), (d)(ii) or (e)(ii) of this section.

(b) Strength. When the vertical length of the fill and vent pipes is such that when filled with liquid the static head imposed upon the bottom of the tank exceeds 10 pounds per square inch, the tank and related piping shall be tested hydrostatically to a pressure equal to the static head thus imposed.

(c) Tightness. In addition to the strength test called for in (7)(a) and (b), all tanks and connections shall be tested for tightness. Except for underground tanks, this tightness test shall be made at operating pressure with air, inert gas, or water prior to placing the tank in service. In the case of field-erected tanks the strength test may be considered to be the test for tank tightness. Underground tanks and piping, before being covered, enclosed, or placed in use, shall be tested for tightness hydrostatically, or with air pressure at not less than 3 pounds per square inch and not more than 5 pounds per square inch.

(d) Repairs. All leaks or deformations shall be corrected in an acceptable manner before the tank is placed in service. Mechanical caulking is not permitted for correcting leaks in welded tanks except pinhole leaks in the roof.

(e) Derated operations. Tanks to be operated at pressures below their design pressure may be tested by the applicable provisions of (7)(a) or (b) based upon the pressure developed under full emergency venting of the tank.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-33005, filed 11/14/88; Order 76-6, § 296-24-33005, filed 3/1/76; Order 73-5, § 296-24-33005, filed 5/9/73 and Order 73-4, § 296-24-33005, filed 5/7/73.]

WAC 296-24-37001 Definitions. (1) Aerated solid powders. Aerated powders shall mean any powdered material used as a coating material which shall be fluidized within a container by passing air uniformly from below. It is common practice to fluidize such materials to form a fluidized powder bed and then dip the part to be coated into the bed in a manner similar to that used in liquid dipping. Such beds are also used as sources for powder spray operations.

(2) Spraying area. Any area in which dangerous quantities of flammable vapors or mists, or combustible residues, dusts, or deposits are present due to the operation of spraying processes.

(3) Spray booth. A power-ventilated structure provided to enclose or accommodate a spraying operation to confine and limit the escape of spray, vapor, and residue, and to safely conduct or direct them to an exhaust system.

(4) Waterwash spray booth. A spray booth equipped with a water washing system designed to minimize dusts or residues entering exhaust ducts and to permit the recovery of overspray finishing material.

(5) Dry spray booth. A spray booth not equipped with a water washing system as described in subsection (4) of this section. A dry spray booth may be equipped with (a) distribution or baffle plates to promote an even flow

of air through the booth or cause the deposit of overspray before it enters the exhaust duct; or (b) overspray dry filters to minimize dusts; or (c) overspray dry filters to minimize dusts or residues entering exhaust ducts; or (d) overspray dry filter rolls designed to minimize dusts or residues entering exhaust ducts; or (e) where dry powders are being sprayed, with powder collection systems so arranged in the exhaust to capture oversprayed material.

(6) Fluidized bed. A container holding powder coating material which is aerated from below so as to form an air-supported expanded cloud of such material through which the preheated object to be coated is immersed and transported.

(7) Electrostatic fluidized bed. A container holding powder coating material which is aerated from below so as to form an air-supported expanded cloud of such material which is electrically charged with a charge opposite to the charge of the object to be coated; such object is transported through the container immediately above the charged and aerated materials in order to be coated.

(8) Approved. Shall mean approved and listed by a nationally recognized testing laboratory. Refer to federal regulation 29 CFR 1910.7 for definition of nationally recognized testing laboratory.

(9) Listed. See "approved" in subsection (8) of this section.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-37001, filed 11/14/88; Order 76-6, § 296-24-37001, filed 3/1/76; Order 73-5, § 296-24-37001, filed 5/9/73 and Order 73-4, § 296-24-37001, filed 5/7/73.]

WAC 296-24-40501 Definitions. (1) Dip tank. Shall mean a tank, vat, or container of flammable or combustible liquid in which articles or materials are immersed for the purpose of coating, finishing, treating, or similar processes.

(2) Vapor area. Shall mean any area containing dangerous quantities of flammable vapors in the vicinity of dip tanks, their drainboards or associated drying, conveying, or other equipment during operation or shutdown periods.

(3) Approved. Unless otherwise indicated, approval or listing by a nationally recognized testing laboratory. Refer to federal regulation 29 CFR 1910.7 for definition of nationally recognized testing laboratory.

(4) Listed. See "approved" in subsection (3) of this section.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-40501, filed 11/14/88; Order 73-5, § 296-24-40501, filed 5/9/73 and Order 73-4, § 296-24-40501, filed 5/7/73.]

Part F-1

STORAGE AND HANDLING OF LIQUEFIED PETROLEUM GASES

WAC

296-24-47501	Definitions.
296-24-47505	Basic rules.
296-24-47507	Cylinder systems.
296-24-47513	Storage of containers awaiting use or resale.

WAC 296-24-47501 Definitions. (1) API-ASME container. A container constructed in accordance with the requirements of WAC 296-24-47505 (3)(a).

(2) ASME container. A container constructed in accordance with the requirements of WAC 296-24-47505 (3)(a).

(3) Container assembly. An assembly consisting essentially of the container and fittings for all container openings, including shutoff valves, excess flow valves, liquid-level gaging devices, safety relief devices, and protective housing.

(4) Containers. All vessels, such as tanks, cylinders, or drums, used for transportation or storing liquefied petroleum gases.

(5) DOT. Department of transportation.

(6) DOT container. A container constructed in accordance with the applicable requirements of 49 CFR chapter 1.

(7) "Liquefied petroleum gases." "LPG" and "LP-gas." Any material which is composed predominantly of any of the following hydrocarbons, or mixtures of them; propane, propylene, butanes (normal butane or iso-butane), and butylenes.

(8) Movable fuel storage tenders or farm carts. Containers not in excess of 1,200 gallons water capacity, equipped with wheels to be towed from one location of usage to another. They are basically nonhighway vehicles, but may occasionally be moved over public roads or highways. They are used as a fuel supply for farm tractors, construction machinery and similar equipment.

(9) P.S.I.G. Pounds per square inch gauge.

(10) P.S.I.A. Pounds per square inch absolute.

(11) Systems. An assembly of equipment consisting essentially of the container or containers, major devices such as vaporizers, safety relief valves, excess flow valves, regulators, and piping connecting such parts.

(12) Vaporizer-burner. An integral vaporizer-burner unit, dependent upon the heat generated by the burner as the source of heat to vaporize the liquid used for dehydrators or dryers.

(13) Ventilation, adequate. When specified for the prevention of fire during normal operation, ventilation shall be considered adequate when the concentration of the gas in a gas-air mixture does not exceed 25 percent of the lower flammable limit.

(14) Approved. Unless otherwise indicated, listing or approval by a nationally recognized testing laboratory. Refer to 29 CFR 1910.7 for definition of nationally recognized testing laboratory.

(15) Listed. See "approved" in WAC 296-24-47501(14).

(16) DOT specifications. Regulations of the department of transportation published in 49 CFR chapter I.

(17) DOT regulations. See WAC 296-24-47501(16).

(18) DOT requirements. See WAC 296-24-47501(16).

(19) DOT cylinders. Cylinders meeting the requirements of 49 CFR chapter I.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-47501, filed 11/14/88; Order 73-5, § 296-24-47501, filed 5/9/73 and Order 73-4, § 296-24-47501, filed 5/7/73.]

WAC 296-24-47505 Basic rules. (1) Odorizing gases.

(a) All liquefied petroleum gases shall be effectively odorized by an approved agent of such character as to indicate positively, by distinct odor, the presence of gas down to concentration in air of not over one-fifth the lower limit of flammability. Odorization, however, is not required if harmful in the use of further processing of the liquefied petroleum gas, or if odorization will serve no useful purpose as a warning agent in such use or further processing.

(b) The odorization requirement of (a) of this subsection shall be considered to be met by the use of 1.0 pounds of ethyl mercaptan, 1.0 pounds of thiophane or 1.4 pounds of amyl mercaptan per ten thousand gallons of LP-gas. However, this listing of odorants and quantities shall not exclude the use of other odorants that meet the odorization requirements of (a) of this subsection.

(2) Approval of equipment and systems.

(a) Each system utilizing DOT containers in accordance with 49 CFR Part 178 shall have its container valves, connectors, manifold valve assemblies, and regulators approved.

(b) Each system for domestic or commercial use utilizing containers of two thousand gallons or less water capacity, other than those constructed in accordance with 49 CFR Part 178, shall consist of a container assembly and one or more regulators, and may include other parts. The system as a unit or the container assembly as a unit, and the regulator or regulators, shall be individually listed.

(c) In systems utilizing containers of over two thousand gallons water capacity, each regulator, container, valve, excess flow valve, gaging device, and relief valve installed on or at the container, shall have its correctness as to design, construction, and performance determined by listing by a nationally recognized testing laboratory. Refer to federal regulation 29 CFR 1910.7 for definition of nationally recognized testing laboratory.

(d) The provisions of subsection (3)(a) of this section shall not be construed as prohibiting the continued use or reinstallation of containers constructed and maintained in accordance with the standard for the Storage and Handling of Liquefied Petroleum Gases NFPA No. 58 in effect at the time of fabrication.

(e) Containers used with systems embodied in this section and WAC 296-24-47509 (3)(c) and 296-24-47513, shall be constructed, tested, and stamped in accordance with DOT specifications effective at the date of their manufacture.

(3) Requirements for construction and original test of containers.

(a) Containers used with systems embodied in WAC 296-24-47509, 296-24-47513 through 296-24-47517, except as provided in WAC 296-24-47511 (3)(c) and 296-24-47515 (2)(a), shall be designed, constructed, and tested in accordance with 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.

(b) Containers constructed according to the 1949 and earlier editions of the ASME Code do not have to comply with U-2 through U-10 and U-19 thereof. Containers constructed according to U-70 in the 1949 and earlier editions do not meet the requirements of this section.

(c) 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 shall be considered in conformance. Containers constructed according to API-ASME Code do not have to comply with section I or with appendix to section I. W-601 to W-606 inclusive in the 1943 and earlier editions do not apply.

(4) Welding of containers.

(a) Welding to the shell, head, or any other part of the container subject to internal pressure, shall be done in compliance with the code under which the tank was fabricated. Other welding is permitted only on saddle plates, lugs, or brackets attached to the container by the tank manufacturer.

(b) Where repair or modification involving welding of DOT containers is required, the container shall be returned to a qualified manufacturer making containers of the same type, and the repair or modification made in compliance with DOT regulations.

(5) Markings on container.

(a) Each container covered in subsection (3)(a) of this section except as provided in subsection (2)(d) of this section shall be marked as specified in the following:

(i) With a marking identifying compliance with, and other markings required by, the rules of the reference under which the container is constructed; or with the stamp and other markings required by the laws, rules or regulations as administered by the state of Washington, department of labor and industries pertaining to such containers.

(ii) With notation as to whether the container is designed for underground or aboveground installation or both. If intended for both and different style hoods are provided, the marking shall indicate the proper hood for each type of installation.

(iii) With the name and address of the supplier of the container, or with the trade name of the container.

(iv) With the water capacity of the container in pounds or gallons, United States standard.

(v) With the pressure in p.s.i.g., for which the container is designed.

(vi) With the wording "This container shall not contain a product having a vapor pressure in excess of— p.s.i.g. at 100°F," see WAC 296-24-47509, Table H-31.

(vii) With the tare weight in pounds or other identified unit of weight for containers with a water capacity of three hundred pounds or less.

(viii) With marking indicating the maximum level to which the container may be filled with liquid at temperatures between 20°F and 130°F, except on containers provided with fixed maximum level indicators or which

are filled by weighing. Markings shall be increments of not more than 20°F. This marking may be located on the liquid level gaging device.

(ix) With the outside surface area in square feet.

(b) Markings specified shall be on a metal nameplate attached to the container and located in such a manner as to remain visible after the container is installed.

(c) When LP-gas and one or more other gases are stored or used in the same area, the containers shall be marked to identify their content. Marking shall be in compliance with American National Standard Z48.1-1954, "Method of Marking Portable Compressed Gas Containers to Identify the Material Contained."

(6) Location of containers and regulating equipment.

(a) Containers, and first stage regulating equipment if used, shall be located outside of buildings, except under one or more of the following:

(i) In buildings used exclusively for container charging, vaporization pressure reduction, gas mixing, gas manufacturing, or distribution.

(ii) When portable use is necessary and in accordance with WAC 296-24-47507(5).

(iii) LP-gas fueled stationary or portable engines in accordance with WAC 296-24-47511 (11) or (12).

(iv) LP-gas fueled industrial trucks used in accordance with WAC 296-24-47511(13).

(v) LP-gas fueled vehicles garaged in accordance with WAC 296-24-47511(14).

(vi) Containers awaiting use or resale when stored in accordance with WAC 296-24-47513.

(b) Each individual container shall be located with respect to the nearest important building or group of buildings or line of adjoining property which may be built on in accordance with Table H-23.

distance shall comply with the appropriate portion of this table, applying the aggregate capacity rather than the capacity per container. If more than one installation is made, each installation shall be separated from another installation by at least twenty-five feet. Do not apply the MINIMUM DISTANCES BETWEEN ABOVE-GROUND CONTAINERS to such installations.

²Note: The above distance requirements may be reduced to not less than ten feet for a single container of one thousand two hundred gallons water capacity or less, providing such a container is at least twenty-five feet from any other LP-gas container of more than one hundred twenty-five gallons water capacity.

(c) Containers installed for use shall not be stacked one above the other.

(d) In industrial installations involving containers of one hundred eighty thousand gallons aggregate water capacity or more, where serious mutual exposures between the container and adjacent properties prevail, firewalls or other means of special protection designed and constructed in accordance with good engineering practices are required.

(e) In the case of buildings devoted exclusively to gas manufacturing and distributing operations, the distances required by Table H-23 may be reduced provided that in no case shall containers of water capacity exceeding five hundred gallons be located closer than ten feet to such gas manufacturing and distributing buildings.

(f) Readily ignitable material such as weeds and long dry grass shall be removed within ten feet of any container.

(g) The minimum separation between liquefied petroleum gas containers and flammable liquid tanks shall be twenty feet, and the minimum separation between a container and the centerline of the dike shall be ten feet. The foregoing provision shall not apply when LP-gas containers of one hundred twenty-five gallons or less capacity are installed adjacent to Class III flammable liquid tanks of two hundred seventy-five gallons or less capacity.

(h) Suitable means shall be taken to prevent the accumulation of flammable liquids under adjacent liquefied petroleum gas containers, such as by diking, diversion curbs, or grading.

(i) When dikes are used with flammable liquid tanks, no liquefied petroleum gas containers shall be located within the diked area.

(7) Container valves and container accessories.

(a) Valves, fittings, and accessories connected directly to the container including primary shutoff valves, shall have a rated working pressure of at least 250 p.s.i.g. and shall be of material and design suitable for LP-gas service. Cast iron shall not be used for container valves, fittings, and accessories. This does not prohibit the use of container valves made of malleable or nodular iron.

(b) Connections to containers, except safety relief connections, liquid level gaging devices, and plugged openings, shall have shutoff valves located as close to the container as practicable.

(c) Excess flow valves, where required shall close automatically at the rated flows of vapor or liquid as specified by the manufacturer. The connections or line

TABLE H-23

Water capacity per container	Minimum distances		
	Under-ground	Above-ground	Between above-ground containers
Less than 125 gals ¹	10 feet	None	None
125 to 250 gallons	10 feet	10 feet	None.
251 to 500 gallons	10 feet	10 feet	3 feet.
501 to 2,000 gallons	25 feet ²	25 feet ²	3 feet.
2,001 to 30,000 gallons	50 feet	50 feet	5 feet.
30,001 to 70,000 gallons	50 feet	75 feet	1/4 of sum of diameters of adjacent containers.
70,001 to 90,000 gallons	50 feet	100 feet	

¹If the aggregate water capacity of a multicontainer installation at a consumer site is five hundred one gallons or greater, the minimum

including valves, fittings, etc., being protected by an excess flow valve shall have a greater capacity than the rated flow of the excess flow valve.

(d) Liquid level gaging devices which are so constructed that outward flow of container contents shall not exceed that passed by a No. 54 drill size opening, need not be equipped with excess flow valves.

(e) Openings from container or through fittings attached directly on container to which pressure gage connection is made, need not be equipped with shutoff or excess flow valves if such openings are restricted to not larger than No. 54 drill size opening.

(f) Except as provided in WAC 296-24-47507 (5)(a)(ii), excess flow and back pressure check valves where required by this section shall be located inside of the container or at a point outside where the line enters the container; in the latter case, installation shall be made in such manner that any undue strain beyond the excess flow or back pressure check valve will not cause breakage between the container and such valve.

(g) Excess flow valves shall be designed with a bypass, not to exceed a No. 60 drill size opening to allow equalization of pressures.

(h) Containers of more than thirty gallons water capacity and less than two thousand gallons water capacity, filled on a volumetric basis, and manufactured after December 1, 1963, shall be equipped for filling into the vapor space.

(8) Piping—Including pipe, tubing, and fittings.

(a) Pipe, except as provided in WAC 296-24-47511 (6)(a) and 296-24-47515 (10)(c) shall be wrought iron or steel (black or galvanized), brass, copper, or aluminum alloy. Aluminum alloy pipe shall be at least Schedule 40 in accordance with the specifications for Aluminum Alloy Pipe, American National Standards Institute (ANSI) H38.7-1969 (ASTM, B241-1969), except that the use of alloy 5456 is prohibited and shall be suitably marked⁹ at each end of each length indicating compliance with American National Standard Institute specifications. Aluminum alloy pipe shall be protected against external corrosion when it is in contact with dissimilar metals other than galvanized steel, or its location is subject to repeated wetting by such liquids as water (except rain water), detergents, sewage, or leaking from other piping, or it passes through flooring, plaster, masonry, or insulation. Galvanized sheet steel or pipe, galvanized inside and out, may be considered suitable protection. The maximum nominal pipe size for aluminum pipe shall be three-fourths inch and shall not be used for pressures exceeding 20 p.s.i.g. Aluminum alloy pipe shall not be installed within six inches of the ground.

(i) Vapor piping with operating pressures not exceeding 125 p.s.i.g. shall be suitable for a working pressure of at least 125 p.s.i.g. Pipe shall be at least Schedule 40 ASTM A-53-69, Grade B Electric Resistance Welded and Electric Flash Welded Pipe or equal.

(ii) Vapor piping with operating pressures over 125 p.s.i.g. and all liquid piping shall be suitable for a working pressure of at least 250 p.s.i.g. Pipe shall 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) shall be used if joints are welded, or welded and flanged.

(b) Tubing shall be seamless and of copper, brass, steel, or aluminum alloy. Copper tubing shall 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 shall be of Type A or B or equivalent as covered in Specification ASTM B210-1968 and shall be suitably marked every eighteen inches indicating compliance with ASTM specifications. The minimum nominal wall thickness of copper tubing and aluminum alloy tubing shall be as specified in Table H-24 and Table H-25.

TABLE H-24

WALL THICKNESS OF COPPER TUBING¹

Note: The standard size by which tube is designated 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 H-25

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.

Aluminum alloy tubing shall be protected against external corrosion when it is in contact with dissimilar metals other than galvanized steel, or its location is subject to repeated wetting by liquids such as water (except rain-water), detergents, sewage, or leakage from other piping,

or it passes through flooring, plaster, masonry, or insulation. Galvanized sheet steel or pipe, galvanized inside and out, may be considered suitable protection. The maximum outside diameter for aluminum alloy tubing shall be three-fourths inch and shall not be used for pressures exceeding 20 p.s.i.g. Aluminum alloy tubing shall not be installed within six inches of the ground.

(c) In systems where the gas in liquid form without pressure reduction enters the building, only heavy walled seamless brass or copper tubing with an internal diameter not greater than three thirty-seconds inch, and a wall thickness of not less than three sixty-fourths inch shall be used. This requirement shall 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.

(d) Pipe joints may be screwed, flanged, welded, soldered, or brazed with a material having a melting point exceeding 1,000°F. Joints on seamless copper, brass, steel, or aluminum alloy gas tubing shall be made by means of approved gas tubing fittings, or soldered or brazed with a material having a melting point exceeding 1,000°F.

(e) For operating pressures of 125 p.s.i.g. or less, fittings shall be designed for a pressure of at least 125 p.s.i.g. For operating pressures above 125 p.s.i.g., fittings shall be designed for a minimum of 250 p.s.i.g.

(f) The use of threaded cast iron pipe fittings such as elbows, tees, crosses, couplings, and unions is prohibited. Aluminum alloy fittings shall be used with aluminum alloy pipe and tubing. Insulated fittings shall be used where aluminum alloy pipe or tubing connects with a dissimilar metal.

(g) Strainers, regulators, meters, compressors, pumps, etc., are not to be considered as pipe fittings. This does not prohibit the use of malleable, nodular, or higher strength gray iron for such equipment.

(h) All materials such as valve seats, packing, gaskets, diaphragms, etc., shall be of such quality as to be resistant to the action of liquefied petroleum gas under the service conditions to which they are subjected.

(i) All piping, tubing, or hose shall be tested after assembly and proved free from leaks at not less than normal operating pressures. After installation, piping and tubing of all domestic and commercial systems shall be tested and proved free of leaks using a manometer or equivalent device that will indicate a drop in pressure. Test shall not be made with a flame.

(j) Provision shall be made to compensate for expansion, contraction, jarring, and vibration, and for settling. This may be accomplished by flexible connections.

(k) Piping outside buildings may be buried, above ground, or both, but shall be well supported and protected against physical damage. Where soil conditions warrant, all piping shall be protected against corrosion. Where condensation may occur, the piping shall be

pitched back to the container, or suitable means shall be provided for revaporization of the condensate.

(9) Hose specifications.

(a) Hose shall be fabricated of materials that are resistant to the action of LP-gas in the liquid and vapor phases. If wire braid is used for reinforcing the hose, it shall be of corrosion-resistant material such as stainless steel.

(b) Hose subject to container pressure shall be marked "LP-gas" or "LPG" at not greater than ten-foot intervals.

(c) Hose subject to container pressure shall be designed for a bursting pressure of not less than 1,250 p.s.i.g.

(d) Hose subject to container pressure shall have its correctness as to design construction and performance determined by being listed (see WAC 296-24-47501(15)).

(e) Hose connections subject to container pressure shall be capable of withstanding, without leakage, a test pressure of not less than 500 p.s.i.g.

(f) Hose and hose connections on the low-pressure side of the regulator or reducing valve shall be designed for a bursting pressure of not less than 125 p.s.i.g. or five times the set pressure of the relief devices protecting that portion of the system, whichever is higher.

(g) 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:

(i) The appliances connected with hose shall be portable and need a flexible connection.

(ii) For use inside buildings the hose shall be of minimum practical length, but shall not exceed six feet except as provided in WAC 296-24-47507 (5)(a)(vii) and shall not extend from one room to another, nor pass through any walls, partitions, ceilings, or floors. Such hose shall not be concealed from view or used in a concealed location. For use outside of buildings, the hose may exceed this length but shall be kept as short as practical.

(iii) The hose shall be approved and shall not be used where it is likely to be subjected to temperatures above 125°F. The hose shall be securely connected to the appliance and the use of rubber slip ends shall not be permitted.

(iv) The shutoff valve for an appliance connected by hose shall be in the metal pipe or tubing and not at the appliance end of the hose. When shutoff valves are installed close to each other, precautions shall be taken to prevent operation of the wrong valve.

(v) Hose used for connecting to wall outlets shall be protected from physical damage.

(10) Safety devices.

(a) Every container except those constructed in accordance with DOT specifications and every vaporizer (except motor fuel vaporizers and except vaporizers described in subsection (11)(b)(iii) of this section and WAC 296-24-47509 (4)(e)(i)) whether heated by artificial means or not, shall be provided with one or more safety relief valves of spring-loaded or equivalent type. These valves shall 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 which is below such discharge. The rate of discharge shall be in accordance with the requirements of (b) or (d) of this subsection in the case of vaporizers.

(b) 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 in accordance with DOT specification shall be as follows:

Surface area (sq. ft.)	Flow rate CFM air
20 or less	626
25	751
30	872
35	990
40	1,100
45	1,220
50	1,330
55	1,430
60	1,540
65	1,640
70	1,750
75	1,850
80	1,950
85	2,050
90	2,150
95	2,240
100	2,340
105	2,440
110	2,530
115	2,630
120	2,720
125	2,810
130	2,900
135	2,990
140	3,080
145	3,170
150	3,260
155	3,350
160	3,440
165	3,530
170	3,620
175	3,700
180	3,790
185	3,880
190	3,960
195	4,050
200	4,130
210	4,300
220	4,470
230	4,630
240	4,800
250	4,960
260	5,130
270	5,290
280	5,450
290	5,610

Surface area (sq. ft.)	Flow rate CFM air
300	5,760
310	5,920
320	6,080
330	6,230
340	6,390
350	6,540
360	6,690
370	6,840
380	7,000
390	7,150
400	7,300
450	8,040
500	8,760
550	9,470
600	10,170
650	10,860
700	11,550
750	12,220
800	12,880
850	13,540
900	14,190
950	14,830
1,000	15,470
1,050	16,100
1,100	16,720
1,150	17,350
1,200	17,960
1,250	18,570
1,300	19,180
1,350	19,780
1,400	20,380
1,450	20,980
1,500	21,570
1,550	22,160
1,600	22,740
1,650	23,320
1,700	23,900
1,750	24,470
1,800	25,050
1,850	25,620
1,900	26,180
1,950	26,750
2,000	27,310

Surface area = total outside surface area of container in square feet.

(c) When the surface area is not stamped on the nameplate or when the marking is not legible, the area can be calculated by using one of the following formulas:

(i) Cylindrical container with hemispherical heads:

$$\text{Area} = \text{Overall length} \times \text{outside diameter} \times 3.1416.$$

(ii) Cylindrical container with other than hemispherical heads:

$$\text{Area} = (\text{Overall length} + 0.3 \text{ outside diameter}) \times \text{outside diameter} \times 3.1416.$$

Note: This formula is not exact, but will give results within the limits of practical accuracy for the sole purpose of sizing relief valves.

(iii) Spherical container:

$$\text{Area} = \text{Outside diameter squared} \times 3.1416.$$

Flow rate-CFM air = Required flow capacity in cubic feet per minute of air at standard conditions, 60°F and atmospheric pressure (14.7 p.s.i.a.).

The rate of discharge may be interpolated for intermediate values of surface area. For containers with total outside surface area greater than two thousand square feet, the required flow rate can be calculated using the formula, flow rate-CFM air = 53.632 A^{0.82}.

A = Total outside surface area of the container in square feet.

Valves not marked "air" have flow rate marking in cubic feet per minute of liquefied petroleum gas. These can be converted to ratings in cubic feet per minute of air by multiplying the liquefied petroleum gas ratings by factors listed below. Air flow ratings can be converted to ratings in cubic feet per minute of liquefied petroleum 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

(d) Minimum required rate of discharge for safety relief valves for liquefied petroleum gas vaporizers (steam heated, water heated, and direct fired).

The minimum required rate of discharge for safety relief valves shall be determined as follows:

(i) 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.

(ii) Obtain the minimum required rate of discharge in cubic feet of air per minute, at 60°F and 14.7 p.s.i.a. from (b) of this subsection, for this total surface area.

(e) Container and vaporizer safety relief valves shall be set to start-to-discharge, with relation to the design pressure of the container, in accordance with Table H-26.

TABLE H-26

Containers	Minimum (percent)	Maximum (percent)
ASME Code; Par. U-68, U-69—1949 and earlier editions	110	125

Containers	Minimum (percent)	Maximum (percent)
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 CFR Chapter I		

¹Manufacturers of safety relief valves are allowed a plus tolerance not exceeding ten percent of the set pressure marked on the valve.

(f) Safety relief devices used with systems employing containers other than those constructed according to DOT specifications shall be so constructed as to discharge at not less than the rates shown in (b) of this subsection, before the pressure is in excess of one hundred twenty percent of the maximum (not including the ten percent referred to in (e) of this subsection) permitted start to discharge pressure setting of the device.

(g) In certain locations sufficiently sustained high temperatures prevail which require the use of a lower vapor pressure product to be stored or the use of a higher designed pressure vessel in order to prevent the safety valves opening as the result of these temperatures. As an alternative the tanks may be protected by cooling devices such as by spraying, by shading, or other effective means.

(h) Safety relief valves shall be arranged so that the possibility of tampering will be minimized. If pressure setting or adjustment is external, the relief valves shall be provided with approved means for sealing adjustment.

(i) Shutoff valves shall not be installed between the safety relief devices and the container, or the equipment or piping to which the safety relief device is connected except that a shutoff valve may be used where the arrangement of this valve is such that full required capacity flow through the safety relief device is always afforded.

(j) Safety relief valves shall have direct communication with the vapor space of the container at all times.

(k) Each container safety relief valve used with systems covered by WAC 296-24-47509, 296-24-47511, 296-24-47515 and 296-24-47517, except as provided in WAC 296-24-47511 (3)(c) shall be plainly and permanently marked with the following: "Container type" of the pressure vessel on which the valve is designed to be installed; the pressure in p.s.i.g. at which the valve is set to discharge; the actual rate of discharge of the valve in cubic feet per minute of air at 60°F and 14.7 p.s.i.a.; and the manufacturer's name and catalog number, for example: T200-250-4050 AIR—indicating that the

valve is suitable for use on a Type 200 container, that it is set to start to discharge at 250 p.s.i.g.; and that its rate of discharge is four thousand fifty cubic feet per minute of air as determined in (b) of this subsection.

(l) Safety relief valve assemblies, including their connections, shall be of sufficient size so as to provide the rate of flow required for the container on which they are installed.

(m) A hydrostatic relief valve shall be installed between each pair of shutoff valves on liquefied petroleum gas liquid piping so as to relieve into a safe atmosphere. The start-to-discharge pressure setting of such relief valves shall not be in excess of 500 p.s.i.g. The minimum setting on relief valves installed in piping connected to other than DOT containers shall not be lower than one hundred forty percent of the container relief valve setting and in piping connected to DOT containers not lower than 400 p.s.i.g. Such a 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, shall be greater than the maximum pressure permitted by the recirculation device in the system.

(n) The discharge from any safety relief device shall not terminate in or beneath any building, except relief devices covered by subsection (6)(a)(i) through (vi) of this section, or WAC 296-24-47507 (4)(a) or (5).

(o) Container safety relief devices and regulator relief vents shall be located not less than five feet in any direction from air openings into sealed combustion system appliances or mechanical ventilation air intakes.

(11) Vaporizer and housing.

(a) Indirect fired vaporizers utilizing steam, water, or other heating medium shall be constructed and installed as follows:

(i) Vaporizers shall be constructed in accordance with the requirements of subsection (3)(a) through (c) of this section and shall 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.

(D) With the name or symbol of the manufacturer.

(ii) Vaporizers having 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 shall have a design pressure not less than 250 p.s.i.g. and need not be permanently marked.

(iii) Heating or cooling coils shall not be installed inside a storage container.

(iv) Vaporizers may be installed in buildings, rooms, sheds, or lean-tos used exclusively for gas manufacturing or distribution, or in other structures of light, non-combustible construction or equivalent, well ventilated near the floor line and roof.

When vaporizing and/or mixing equipment is located in a structure or building not used exclusively for gas manufacturing or distribution, either attached to or within such a building, such structure or room shall be separated from the remainder of the building by a wall designed to withstand a static pressure of at least one hundred pounds per square foot. This wall shall have no openings or pipe or conduit passing through it. Such structure or room shall be provided with adequate ventilation and shall have a roof or at least one exterior wall of lightweight construction.

(v) Vaporizers shall have, at or near the discharge, a safety relief valve providing an effective rate of discharge in accordance with subsection (10)(d) of this section, except as provided in WAC 296-24-47509 (4)(e)(i).

(vi) The heating medium lines into and leaving the vaporizer shall be provided with suitable means for preventing the flow of gas into the heat systems in the event of tube rupture in the vaporizer. Vaporizers shall be provided with suitable automatic means to prevent liquid passing through the vaporizers to the gas discharge piping.

(vii) The device that supplies the necessary heat for producing steam, hot water, or other heating medium may be installed in a building, compartment, room, or lean-to which shall be ventilated near the floorline and roof to the outside. The device location shall be separated from all compartments or rooms containing liquefied petroleum gas vaporizers, pumps, and central gas mixing devices by a wall designed to withstand a static pressure of at least one hundred pounds per square foot. This wall shall have no openings or pipes or conduit passing through it. This requirement does not apply to the domestic water heaters which may supply heat for a vaporizer in a domestic system.

(viii) Gas-fired heating systems supplying heat exclusively for vaporization purposes shall be equipped with automatic safety devices to shut off the flow of gas to main burners, if the pilot light should fail.

(ix) Vaporizers may be an integral part of a fuel storage container directly connected to the liquid section or gas section or both.

(x) Vaporizers shall not be equipped with fusible plugs.

(xi) Vaporizer houses shall not have unprotected drains to sewers or sump pits.

(b) Atmospheric vaporizers employing heat from the ground or surrounding air shall be installed as follows:

(i) Buried underground, or

(ii) Located inside the building close to a point at which pipe enters the building provided the capacity of the unit does not exceed one quart.

(iii) Vaporizers of less than one quart capacity heated by the ground or surrounding air, need not be equipped with safety relief valves provided that adequate tests demonstrate that the assembly is safe without safety relief valves.

(c) Direct gas-fired vaporizers shall be constructed, marked, and installed as follows:

(i) In accordance with the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code—1968 that are applicable to the maximum working conditions for which the vaporizer is designed.

(ii) 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.

(iii) Vaporizers may be connected to the liquid section or the gas section of the storage container, or both; but in any case there shall be at the container a manually operated valve in each connection to permit completely shutting off when desired, of all flow of gas or liquid from container to vaporizer.

(iv) Vaporizers with capacity not exceeding thirty-five gallons per hour shall be located at least five feet from container shutoff valves. Vaporizers having capacity of more than thirty-five gallons but not exceeding one hundred gallons per hour shall be located at least ten feet from the container shutoff valves. Vaporizers having a capacity greater than one hundred gallons per hour shall be located at least fifteen feet from container shutoff valves.

(v) Vaporizers may be installed in buildings, rooms, housings, sheds, or lean-tos used exclusively for vaporizing or mixing of liquefied petroleum gas. Vaporizing housing structures shall be of noncombustible construction, 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 shall be separated from the remainder of the building by a wall designed to withstand a static pressure of at least one hundred pounds per square foot. This wall shall have no openings or pipes or conduit passing through it. Such structure or room shall be provided with adequate ventilation, and shall have a roof or at least one exterior wall of lightweight construction.

(vi) Vaporizers shall have at or near the discharge, a safety relief valve providing an effective rate of discharge in accordance with subsection (10)(d) of this section. The relief valve shall be so located as not to be subjected to temperatures in excess of 140°F.

(vii) Vaporizers shall be provided with suitable automatic means to prevent liquid passing from the vaporizer to the gas discharge piping of the vaporizer.

(viii) Vaporizers shall be provided with means for manually turning off the gas to the main burner and pilot.

(ix) Vaporizers shall be equipped with 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 B.T.U. per hour, the pilot also shall be equipped with an automatic safety device to shut off the flow of gas to the pilot should the pilot flame be extinguished.

(x) Pressure regulating and pressure reducing equipment if located within ten feet of a direct fired vaporizer

shall be separated from the open flame by a substantially airtight noncombustible partition or partitions.

(xi) Except as provided in (c)(v) of this subsection, the following minimum distances shall be maintained between direct fired vaporizers and the nearest important building or group of buildings or line of adjoining property which may be built upon:

(A) Ten feet for vaporizers having a capacity of fifteen gallons per hour or less vaporizing capacity.

(B) Twenty-five feet for vaporizers having a vaporizing capacity of sixteen to one hundred gallons per hour.

(C) Fifty feet for vaporizers having a vaporizing capacity exceeding one hundred gallons per hour.

(xii) Direct fired vaporizers shall not raise the product pressure above the design pressure of the vaporizer equipment nor shall they raise the product pressure within the storage container above the pressure shown in the second column of Table H-31. (See WAC 296-24-47509.)

(xiii) Vaporizers shall not be provided with fusible plugs.

(xiv) Vaporizers shall not have unprotected drains to sewers or sump pits.

(d) Direct gas-fired tank heaters, shall be constructed and installed as follows:

(i) Direct gas-fired tank heaters, and tanks to which they are applied, shall only be installed above ground.

(ii) Tank heaters shall be permanently marked with the name of the manufacturer, the rated B.T.U. 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.

(iii) Tank heaters shall be provided with a means for manually turning off the gas to the main burner and pilot.

(iv) Tank heaters shall be equipped with 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 B.T.U. per hour, the pilot also shall be equipped with an automatic safety device to shut off the flow of gas to the pilot should the pilot flame be extinguished.

(v) Pressure regulating and pressure reducing equipment if located within ten feet of a direct fired tank heater shall be separated from the open flame by a substantially airtight noncombustible partition.

(vi) The following minimum distances shall be maintained between a storage tank heated by a direct fired tank heater and the nearest important building or group of buildings or line of adjoining property which may be built upon:

(A) Ten feet for storage containers of less than five hundred gallons water capacity.

(B) Twenty-five feet for storage containers of five hundred to one thousand two hundred gallons water capacity.

(C) Fifty feet for storage containers of over one thousand two hundred gallons water capacity.

(vii) No direct fired tank heater shall raise the product pressure within the storage container over seventy-five percent of the pressure set out in the second column of Table H-31. (See WAC 296-24-47509.)

(e) The vaporizer section of vaporizer-burners used for dehydrators or dryers shall be located outside of buildings; they shall be constructed and installed as follows:

(i) Vaporizer-burners shall have a minimum design pressure of 250 p.s.i.g. with a factor of safety of five.

(ii) Manually operated positive shutoff valves shall be located at the containers to shut off all flow to the vaporizer-burners.

(iii) Minimum distances between storage containers and vaporizer-burners shall be as follows:

Water capacity per container (gallons)	Minimum distances (feet)
Less than 501	10
501 to 2,000	25
Over 2,000	50

(iv) The vaporizer section of vaporizer-burners shall be protected by a hydrostatic relief valve. The relief valve shall be located so as not to be subjected to temperatures in excess of 140°F. The start-to-discharge pressure setting shall be such as to protect the components involved, but not less than 250 p.s.i.g. The discharge shall be directed upward and away from component parts of the equipment and away from operating personnel.

(v) Vaporizer-burners shall be provided with means for manually turning off the gas to the main burner and pilot.

(vi) Vaporizer-burners shall be equipped with automatic safety devices to shut off the flow of gas to the main burner and pilot in the event the pilot is extinguished.

(vii) Pressure regulating and control equipment shall be located or protected so that the temperatures surrounding this equipment shall not exceed 140°F except that equipment components may be used at higher temperatures if designed to withstand such temperatures.

(viii) Pressure regulating and control equipment when located downstream of the vaporizer shall be designed to withstand the maximum discharge temperature of the vapor.

(ix) The vaporizer section of vaporizer-burners shall not be provided with fusible plugs.

(x) Vaporizer coils or jackets shall be made of ferrous metal or high temperature alloys.

(xi) Equipment utilizing vaporizer-burners shall be equipped with 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.

(12) Filling densities.

(a) The "filling density" is defined as the percent ratio of the weight of the gas in a container to the weight of water the container will hold at 60°F. All containers

shall be filled according to the filling densities shown in Table H-27.

TABLE H-27
MAXIMUM PERMITTED FILLING DENSITY

Specific gravity at 60°F (15.6°C)	Above ground containers		Under-ground containers, all capacities
	0 to 1,200 U.S. gals. (1,000 imp. gal. total water cap.	Over 1,200 U.S. gals. (1,000 imp. gals. 4,550 liters) total water cap.	
	Percent	Percent	Percent
0.496-0.503	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

(b) Except as provided in (c) of this subsection, any container including mobile cargo tanks and portable tank containers regardless of size or construction, shipped under DOT jurisdiction or constructed in accordance with 49 CFR Chapter I specifications shall be charged according to 49 CFR Chapter I requirements.

(c) Portable containers not subject to DOT jurisdiction (such as, but not limited to, motor fuel containers on industrial and lift trucks, and farm tractors covered in subsection (5) of this section, or containers recharged at the installation) may be filled either by weight, or by volume using a fixed length dip tube gaging device.

(13) LP-gas in buildings.

(a) Vapor shall be piped into buildings at pressures in excess of 20 p.s.i.g. only if the buildings or separate areas thereof,

(i) Are constructed in accordance with this section;

(ii) 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;

(iii) Buildings, structures, or equipment under construction or undergoing major renovation.

(b) Liquid may be permitted in buildings as follows:

(i) 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 thereof are constructed in accordance with this section.

(ii) Buildings, structures, or equipment under construction or undergoing major renovation provided the temporary piping meets the following conditions:

(A) Liquid piping inside the building shall conform to the requirements of subsection (8) of this section, and shall not exceed three-fourths iron pipe size. Copper tubing with an outside diameter of three-fourths inch or less may be used provided it conforms to Type K of Specifications for Seamless Water Tube, ANSI H23.1-1970 (ASTM B88-1969) (see WAC 296-24-47505 Table H-24). All such piping shall be protected against construction hazards. Liquid piping inside buildings shall be kept to a minimum. Such piping shall be securely fastened to walls or other surfaces so as to provide adequate protection from breakage and so located as to subject the liquid line to lowest ambient temperatures.

(B) A shutoff valve shall be installed in each intermediate branch line where it takes off the main line and shall be readily accessible. A shutoff valve shall also be placed at the appliance end of the intermediate branch line. Such shutoff valve shall be upstream of any flexible connector used with the appliance.

(C) Suitable excess flow valves shall be installed in the container outlet line supplying liquid LP-gas to the building. A suitable excess flow valve shall be installed immediately downstream of each shutoff valve. Suitable excess flow valves shall be installed where piping size is reduced and shall be sized for the reduced size piping.

(D) Hydrostatic relief valves shall be installed in accordance with subsection (10)(m) of this section.

(E) The use of hose to carry liquid between the container and the building or at any point in the liquid line, except at the appliance connector, shall be prohibited.

(F) Where flexible connectors are necessary for appliance installation, such connectors shall be as short as practicable and shall comply with subsection (8)(b) or (9) of this section.

(G) Release of fuel when any section of piping or appliances is disconnected shall be minimized by either of the following methods:

(I) Using an approved automatic quick-closing coupling (a type closing in both directions when coupled in the fuel line), or

(II) Closing the valve nearest to the appliance and allowing the appliance to operate until the fuel in the line is consumed.

(III) Portable containers shall not be taken into buildings except as provided in subsection (6)(a) of this section.

(14) Transfer of liquids. The employer shall assure that:

(a) At least one attendant shall remain close to the transfer connection from the time the connections are first made until they are finally disconnected, during the transfer of the product.

(b) Containers shall be filled or used only upon authorization of the owner.

(c) Containers manufactured in accordance with specifications of 49 CFR Part 178 and authorized by 49 CFR Chapter 1 as a "single trip" or "nonrefillable container" shall not be refilled or reused in LP-gas service.

(d) Gas or liquid shall not be vented to the atmosphere to assist in transferring contents of one container to another, except as provided in WAC 296-24-47511 (5)(d) and except that this shall not preclude the use of listed pump utilizing LP-gas in the vapor phase as a source of energy and venting such gas to the atmosphere at a rate not to exceed that from a No. 31 drill size opening and provided that such venting and liquid transfer shall be located not less than fifty feet from the nearest important building.

(e) Filling of fuel containers for industrial trucks or motor vehicles from industrial bulk storage containers shall be performed not less than ten feet from the nearest important masonry-walled building or not less than twenty-five feet from the nearest important building or other construction and, in any event, not less than twenty-five feet from any building opening.

(f) Filling of portable containers, containers mounted on skids, fuel containers on farm tractors, or similar applications, from storage containers used in domestic or commercial service, shall be performed not less than fifty feet from the nearest important building.

(g) The filling connection and the vent from the liquid level gages in containers, filled at point of installation, shall not be less than ten feet in any direction from air openings into sealed combustion system appliances or mechanical ventilation air intakes.

(h) Fuel supply containers shall be gaged and charged only in the open air or in buildings especially provided for that purpose.

(i) The maximum vapor pressure of the product at 100°F which may be transferred into a container shall be in accordance with WAC 296-24-47509(2) and 296-24-47511(3). (For DOT containers use DOT requirements.)

(j) Marketers and users shall exercise precaution to assure that only those gases for which the system is designed, examined, and listed, are employed in its operation, particularly with regard to pressures.

(k) Pumps or compressors shall be designed for use with LP-gas. When compressors are used they shall normally take suction from the vapor space of the container being filled and discharge to the vapor space of the container being emptied.

(l) Pumping systems, when equipped with a positive displacement pump, shall include a recirculating device which shall limit 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 shall be protected so that pressure does not exceed 350 p.s.i.g. If a recirculation system discharges into the supply tank and contains a manual shutoff valve, an adequate secondary safety recirculation system shall be incorporated which shall have no means of rendering it inoperative. Manual shutoff valves in recirculation systems shall be kept open except during an

emergency or when repairs are being made to the system.

(m) When necessary, unloading piping or hoses shall be provided with suitable bleeder valves for relieving pressure before disconnection.

(n) Agricultural air moving equipment, including crop dryers, shall be shut down when supply containers are being filled unless the air intakes and sources of ignition on the equipment are located fifty feet or more from the container.

(o) Agricultural equipment employing open flames or equipment with integral containers, such as flame cultivators, weed burners, and, in addition, tractors, shall be shut down during refueling.

(15) Tank car or transport truck loading or unloading points and operations.

(a) The track of tank car siding shall be relatively level.

(b) A "tank car connected" sign, as covered by DOT rules, shall be installed at the active end or ends of the siding while the tank car is connected.

(c) While cars are on side track for loading or unloading, the wheels at both ends shall be blocked on the rails.

(d) The employer shall insure that an employee is in attendance at all times while the tank car, cars, or trucks are being loaded or unloaded.

(e) A backflow check valve, excess-flow valve, or a shutoff valve with means of remote closing, to protect against uncontrolled discharge of LP-gas from storage tank piping shall be installed close to the point where the liquid piping and hose or swing joint pipe is connected.

(f) Except as provided in (g) of this subsection, when the size (diameter) of the loading or unloading hoses and/or piping is reduced below the size of the tank car or transport truck loading or unloading connections, the adaptors to which lines are attached shall be equipped with either a backflow check valve, a properly sized excess flow valve, or shutoff valve with means of remote closing, to protect against uncontrolled discharge from the tank car or transport truck.

(g) The requirement of (f) of this subsection shall not apply if the tank car or transport is equipped with a quick-closing internal valve that can be remotely closed.

(h) The tank car or transport truck loading or unloading point shall be located with due consideration to the following:

(i) Proximity to railroads and highway traffic.

(ii) The distance of such unloading or loading point from adjacent property.

(iii) With respect to buildings on installer's property.

(iv) Nature of occupancy.

(v) Topography.

(vi) Type of construction of buildings.

(vii) Number of tank cars or transport trucks that may be safely loaded or unloaded at one time.

(viii) Frequency of loading or unloading.

(i) Where practical, the distance of the unloading or loading point shall conform to the distances in subsection (6)(b) of this section.

(16) Instructions. Personnel performing installation, removal, operation, and maintenance work shall be properly trained in such function.

(17) Electrical equipment and other sources of ignition.

(a) Electrical equipment and wiring shall be of a type specified by and shall be installed in accordance with WAC 296-24-956 through 296-24-960, for ordinary locations except that fixed electrical equipment in classified areas shall comply with subsection (18) of this section.

(b) Open flames or other sources of ignition shall not be permitted in vaporizer rooms (except those housing direct-fired vaporizers), pumphouses, container charging rooms or other similar locations. Direct-fired vaporizers shall not be permitted in pumphouses or container charging rooms.

Note: Liquefied petroleum gas storage containers do not require lightning protection. Since liquefied petroleum 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).

(c) Open flames (except as provided for in (b) of this subsection), cutting or welding, portable electric tools, and extension lights capable of igniting LP-gas, shall not be permitted within classified areas specified in Table H-28 of this section unless the LP-gas facilities have been freed of all liquid and vapor, or special precautions observed under carefully controlled conditions.

(18) Fixed electrical equipment in classified areas. Fixed electrical equipment and wiring installed within classified areas shall comply with Table H-28 of this section and shall be installed in accordance with WAC 296-24-956 through 296-24-960. This provision does not apply to fixed electrical equipment at residential or commercial installations of LP-gas systems or to systems covered by WAC 296-24-47511 or 296-24-47515.

(19) Liquid-level gaging device.

(a) Each container manufactured after December 31, 1965, and filled on a volumetric basis shall be equipped with a fixed liquid-level gage to indicate the maximum permitted filling level as provided in (e) of this subsection. Each container manufactured after December 31, 1969, shall have permanently attached to the container adjacent to the fixed level gage a marking showing the percentage full that will be shown by that gage. When a variable liquid-level gage is also provided, the fixed liquid-level gage will also serve as a means for checking the variable gage. These gages shall be used in charging containers as required in subsection (12) of this section.

(b) All variable gaging devices shall be arranged so that the maximum liquid level for butane, for a fifty-fifty mixture of butane and propane, and for propane, to which the container may be charged is readily determinable. The markings indicating the various liquid levels from empty to full shall be on the system nameplate or gaging device or part may be on the system nameplate and part on the gaging device. Dials of magnetic or rotary gages shall show whether they are for cylindrical or spherical containers and whether for aboveground or

underground service. The dials of gages intended for use only on aboveground containers of over one thousand two hundred gallons water capacity shall be so marked.

(c) Gaging devices that require bleeding of the product to the atmosphere, such as the rotary tube, fixed tube, and slip tube, shall be designed so that the bleed valve maximum opening is not larger than a No. 54 drill size, unless provided with excess flow valve.

(d) Gaging devices shall have a design working pressure of at least 250 p.s.i.g.

(e) Length of tube or position of fixed liquid-level gage shall be designed to indicate the maximum level to which the container may be filled for the product contained. This level shall be based on the volume of the product at 40°F at its maximum permitted filling density for aboveground containers and at 50°F for underground containers. The employer shall calculate the filling point for which the fixed liquid level gage shall be designed according to the method in this subsection.

TABLE H-28

Part	Location	Extent of classified area ¹	Equipment shall be suitable for National Electrical Code, Class 1, Group D ²
A	Storage containers other than DOT cylinders.	Within 15 feet in all directions from connections, except connections otherwise covered in Table H-28.	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	Gage 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.

Part	Location	Extent of classified area ¹	Equipment shall be suitable for National Electrical Code, Class 1, Group D ²
D	Relief valve discharge other than those on DOT cylinders.	Within direct path of discharge.	Division 1. NOTE—Fixed electrical equipment should preferably not be installed.
		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 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.
		Indoors with adequate ventilation. ⁴	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 abovegrade.	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.

Part	Location	Extent of classified area ¹	Equipment shall be suitable for National Electrical Code, Class 1, Group D ²
		Up to 18 inches abovegrade within 20 ft. horizontally from any edge of enclosure.	Division 2.
		NOTE: 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.
		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.

Part	Location	Extent of classified area ¹	Equipment shall be suitable for National Electrical Code, Class 1, Group D 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.

¹The classified area shall not extend beyond an unpierced wall, roof, or solid vaportight partition.

²See chapter 296-46 WAC, and WAC 296-24-956 through 296-24-960.

³When classifying extent of hazardous area, consideration shall be given to possible variations in the spotting of tank cars and tank vehicles at the unloading points and the effect these variations of actual spotting point may have on the point of connection.

⁴Ventilation, either natural or mechanical, is considered adequate when the concentration of the gas in a gas-air mixture does not exceed twenty-five percent of the lower flammable limit under normal operating conditions.

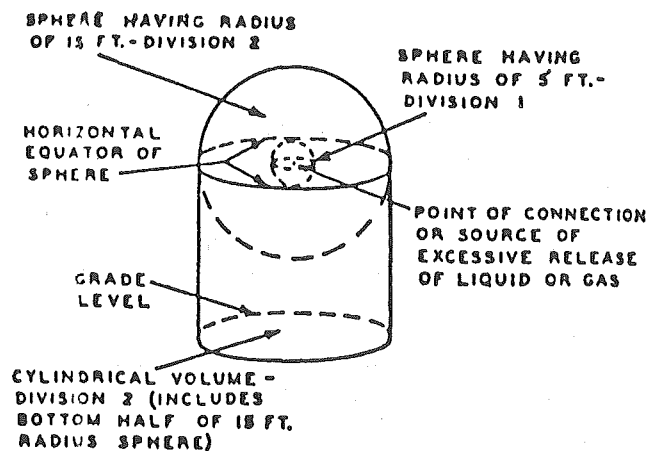


Figure H-1

Note: It is impossible to set out in a table the length of a fixed dip tube for various capacity tanks because of the varying tank diameters and lengths and because the tank may be installed either in a vertical or horizontal position. Knowing the maximum permitted filling volume in gallons, however, the length of the fixed tube can be determined by the use of a strapping table obtained from the container manufacturer. The

length of the fixed tube should be such 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:

$$\frac{\text{Water capacity (gals.) of container}^* \times \text{filling density}^{**}}{\text{Specific gravity of LP-gas}^* \times \text{volume correction factor}^{***} \times 100} = \frac{\text{Maximum volume of LP-gas}}{\text{Total water content of container in gallons.}}$$

*Measure at 60°F.

**From subsection (12)(a) of this section "filling densities."

***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 the following factors shall be used.

(i) Formula for determining maximum volume of liquefied petroleum gas for which a fixed length of dip tube shall be set:

TABLE H-29
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

(ii) The maximum volume of LP-gas which 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 is calculated by the following formula.

(iii) The maximum weight of LP-gas which may be placed in a container for determining the length of a fixed dip tube is determined by multiplying the maximum volume of liquefied petroleum gas obtained by the formula in (e)(i) of this subsection by the pounds of liquefied petroleum gas in a gallon at 40°F for aboveground and at 50°F for underground containers. For example, 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.

$$\frac{100 \text{ (gals.)} \times 42 \text{ (filling density from (12)(a) of this subsection)}}{0.510 \times 1.031 \text{ (correction factor from Table H-29)} \times 100} = \frac{4200}{52.6}$$

79.8 gallons propane, the maximum amount permitted to be placed in a 100-gallon total water capacity aboveground container equipped with a fixed dip tube.

$$\frac{\text{Maximum volume of LP-gas (from formula in (e)(i) of this subsection)} \times 100}{\text{Total water content of container in gallons.}} = \text{Maximum percent of LP-gas}$$

	Aboveground, pounds per gallon	Underground, pounds per gallon
Propane	4.37	4.31
N Butane	4.97	4.92

(f) Fixed liquid-level gages used on containers other than DOT containers shall be stamped on the exterior of the gage 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 gage when it is located at the maximum permitted filling level. For portable containers that may be filled in the horizontal and/or vertical position the letters "DT" shall 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 shall be placed both on the exterior of the gage and on the container. On aboveground or cargo containers where the gages are positioned at specific levels, the marking may be specified in percent of total tank contents and the marking shall be stamped on the container.

(g) Gage glasses of the columnar type shall be restricted to charging plants where the fuel is withdrawn in the liquid phase only. They shall be equipped with valves having metallic handwheels, with excess flow valves, and with extra-heavy glass adequately protected with a metal housing applied by the gage manufacturer. They shall be shielded against the direct rays of the sun. Gage glasses of the columnar type are prohibited on tank trucks, and on motor fuel tanks, and on containers used in domestic, commercial, and industrial installations.

(h) Gaging devices of the float, or equivalent type which do not require flow for their operation and having connections extending to a point outside the container do not have to be equipped with excess flow valves provided the piping and fittings are adequately designed to withstand the container pressure and are properly protected against physical damage and breakage.

(20) Requirements for appliances.

(a) Except as provided in (b) of this subsection, new commercial and industrial gas consuming appliances shall be approved.

(b) Any appliance that was originally manufactured for operation with a gaseous fuel other than LP-gas and is in good condition may be used with LP-gas only after it is properly converted, adapted, and tested for performance with LP-gas before the appliance is placed in use.

(c) Unattended heaters used inside buildings for the purpose of animal or poultry production or care shall be equipped with an approved automatic device designed to shut off the flow of gas to the main burners, and pilot if used, in the event of flame extinguishment.

(d) All commercial, industrial, and agricultural appliances or equipment shall be installed in accordance with the requirements of these standards and in accordance with the following:

(i) Domestic and commercial appliances—NFPA 54-1969, Standard for the Installation of Gas Appliances and Gas Piping.

(ii) Industrial appliances—NFPA 54A-1969, Standard for the Installation of Gas Piping and Gas Equipment on Industrial Premises and Certain Other Premises.

(iii) Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines—NFPA 37-1970.

(iv) Standard for the Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment, NFPA 96-1970.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-47505, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 85-10-004 (Order 85-09), § 296-24-47505, filed 4/19/85; Order 76-6, § 296-24-47505, filed 3/1/76; Order 73-5, § 296-24-47505, filed 5/9/73 and Order 73-4, § 296-24-47505, filed 5/7/73.]

WAC 296-24-47507 Cylinder systems. (1) Application. This section applies specifically to systems utilizing containers constructed in accordance with DOT specifications. All requirements of WAC 296-24-47505 apply to this section unless otherwise noted in WAC 296-24-47505.

(2) Marking of containers.

(a) Containers shall be marked in accordance with DOT regulations. Additional markings not in conflict with DOT regulations may be used.

(b) Except as provided in (c) of this subsection each container shall be marked with its water capacity in pounds or other identified unit of weight.

(c) If a container is filled and maintained only by the owner or his representative and if the water capacity of each container is identified by a code, compliance with (b) of this subsection is not required.

(d) Each container shall be marked with its tare weight in pounds or other identified unit of weight including all permanently attached fittings but not the cap.

(3) Description of a system. A system shall include the container base or bracket, containers, container valves, connectors, manifold valve assembly, regulators, and relief valves.

(4) Containers and regulating equipment installed outside of buildings or structures.

(a) Containers shall not be buried below ground. However, this shall not prohibit the installation in a compartment or recess below grade level, such as a niche in a slope or terrace wall which is used for no other purpose, providing that 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 which is below the level of such outlet.

Except as provided in WAC 296-24-47505 (10)(n), the discharge from safety relief devices shall be located not less than three feet horizontally away from any building opening which is below the level of such discharge and shall not terminate beneath any building unless such space is well ventilated to the outside and is not enclosed on more than two sides.

(b) Containers shall be set upon firm foundation or otherwise firmly secured; the possible effect on the outlet piping of settling shall be guarded against by a flexible connection or special fitting.

(5) Containers and equipment used inside of buildings or structures.

(a) When operational requirements make portable use of containers necessary and their location outside of buildings or structures is impracticable, containers and equipment are permitted to be used inside of buildings or structures in accordance with (a)(i) through (xii) of this subsection, and, in addition, such other provisions of this section as are applicable to the particular use or occupancy.

(i) Containers in use shall mean connected for use.

(ii) Systems utilizing containers having a water capacity greater than two and one-half pounds (nominal one pound LP-gas capacity) shall be equipped with excess flow valves. Such excess flow valves shall be either integral with the container valves or in the connections to the container valve outlets. In either case, an excess flow valve shall be installed in such a manner that any undue strain beyond the excess flow valve will not cause breakage between the container and the excess flow valve. The installation of excess flow valves shall take into account the type of valve protection provided.

(iii) Regulators, if used, shall be either directly connected to the container valves or to manifolds connected to the container valves. The regulator shall be suitable for use with LP-gas. Manifolds and fittings connecting containers to pressure regulator inlets shall be designed for at least 250 p.s.i.g. service pressure.

(iv) Valves on containers having a water capacity greater than fifty pounds (nominal twenty pounds LP-gas capacity) shall be protected while in use.

(v) Containers shall be marked in accordance with WAC 296-24-47505 (5)(c) and subsection (2) of this section.

(vi) Pipe or tubing shall conform to WAC 296-24-47505(8) except that aluminum pipe or tubing shall not be used.

(vii) Hose shall be designed for a working pressure of at least 250 p.s.i.g. Hose and hose connections shall have their correctness as to design, construction and performance determined by listing by a nationally recognized testing laboratory.

(A) The hose length may exceed the length specified in WAC 296-24-47505 (9)(g)(ii), but shall be as short as practicable. Refer to federal regulation 29 CFR

1910.7 for definition of nationally recognized testing laboratory.

(B) Hose shall be long enough to permit compliance with spacing provisions of this section without kinking or straining or causing hose to be so close to a burner as to be damaged by heat.

(viii) Portable heaters, including salamanders, shall be equipped with an approved automatic device to shut off the flow of gas to the main burner, and pilot if used, in the event of flame extinguishment. Such heaters having inputs above 50,000 B.t.u. manufactured on or after May 17, 1967, and such heaters having inputs above 100,000 B.t.u. manufactured before May 17, 1967, shall be equipped with either:

(A) A pilot which must be lighted and proved before the main burner can be turned on; or

(B) An electric ignition system. The provisions of (a)(viii) of this subsection do not apply to tar kettle burners, torches, melting pots, nor do they apply to portable heaters under 7,500 B.t.u.h. input when used with containers having a maximum water capacity of two and one-half pounds. Container valves, connectors, regulators, manifolds, piping, and tubing shall not be used as structural supports for heaters.

(ix) Containers, regulating equipment, manifolds, pipe, tubing, and hose shall be located so as 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 by unauthorized persons.

(x) Heat producing equipment shall be located and used so as to minimize the possibility of ignition of combustibles.

(xi) Containers having water capacity greater than two and one-half pounds (nominal one pound LP-gas capacity) connected for use, shall stand on a firm and substantially level surface and, when necessary, shall be secured in an upright position.

(xii) Containers, including the valve protective devices, shall be installed so as to minimize the probability of impingement of discharge of safety relief devices upon containers.

(b) Containers having a maximum water capacity of two and one-half pounds (nominal one pound LP-gas capacity) are permitted to be used inside of buildings as part of approved self-contained hand torch assemblies or similar appliances.

(c) Containers having a maximum water capacity of twelve pounds (nominal five pounds LP-gas capacity) are permitted to be used temporarily inside of buildings for public exhibition or demonstration purposes, including use for classroom demonstrations.

(d) When buildings frequented by the public are open to the public, containers are permitted to be used for repair or minor renovation as follows:

(i) The maximum water capacity of individual containers shall be fifty pounds (nominal twenty pounds LP-gas capacity).

(ii) The number of LP-gas containers shall not exceed the number of workmen assigned to using the LP-gas.

(iii) Containers having a water capacity of greater than two and one-half pounds (nominal one pound LP-gas capacity[]) shall not be left unattended in such buildings.

(e) When buildings frequented by the public are not open to the public, containers are permitted to be used for repair or minor renovations, as follows:

The provisions of (f) of this subsection shall apply except that containers having a water capacity greater than two and one-half pounds (nominal one pound LP-gas capacity) shall not be left unattended in such buildings.

(f) Containers are permitted to be used in buildings or structures under construction or undergoing major renovation when such buildings or structures are not occupied by the public, as follows:

(i) The maximum water capacity of individual containers shall be two hundred forty-five pounds (nominal one hundred pounds LP-gas capacity).

(ii) For temporary heating such as curing concrete, drying plaster and similar applications, heaters (other than integral heater-container units) shall be located at least six feet from any LP-gas container. This shall not prohibit the use of heaters specifically designed for attachment to the container or to a supporting standard, provided they are designed and installed so as to prevent direct or radiant heat application from the heater onto the container. Blower and radiant type heater shall not be directed toward any LP-gas container within twenty feet.

(iii) If two or more heater-container units, of either the integral or nonintegral type, are located in an unpartitioned area on the same floor, the container or containers of each unit shall be separated from the container or containers of any other unit by at least twenty feet.

(iv) When heaters are connected to containers for use in an unpartitioned area on the same floor, the total water capacity of containers manifolded together for connection to a heater or heaters shall not be greater than seven hundred thirty-five pounds (nominal three hundred pounds LP-gas capacity). Such manifolds shall be separated by at least twenty feet.

(v) On floors on which heaters are not connected for use, containers are permitted to be manifolded together for connection to a heater or heaters on another floor, provided:

(A) The total water capacity of containers connected to any one manifold is not greater than two thousand four hundred fifty pounds (nominal one thousand pounds LP-gas capacity) and;

(B) Where more than one manifold having a total water capacity greater than seven hundred thirty-five pounds (nominal three hundred pounds LP-gas capacity) are located in the same unpartitioned area, they shall be separated by at least fifty feet.

(vi) Storage of containers awaiting use shall be in accordance with WAC 296-24-47513.

(g) Containers are permitted to be used in industrial occupancies for processing, research, or experimental purposes as follows:

(i) The maximum water capacity of individual containers shall be two hundred forty-five pounds (nominal one hundred pounds LP-gas capacity).

(ii) Containers connected to a manifold shall have a total water capacity not greater than seven hundred thirty-five pounds (nominal three hundred pounds LP-gas capacity) and not more than one such manifold may be located in the same room unless separated at least twenty feet from a similar unit.

(iii) The amount of LP-gas in containers for research and experimental use shall be limited to the smallest practical quantity.

(h) Containers are permitted to be 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, as follows: Containers and heaters shall comply with and be used in accordance with (f) of this subsection.

(i) Containers are permitted to 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:

(i) Containers and heaters shall comply with and be used in accordance with (f) of this subsection.

(ii) The temporary heating equipment shall not be left unattended.

(j) Containers are permitted to be used temporarily in buildings for training purposes related in installation and use of LP-gas systems, as follows:

(i) The maximum water capacity of individual containers shall be two hundred forty-five pounds (nominal one hundred pounds LP-gas capacity), but the maximum quantity of LP-gas that may be placed in each container shall be twenty pounds.

(ii) If more than one such container is located in the same room, the containers shall be separated by at least twenty feet.

(iii) Containers shall be removed from the building when the training class has terminated.

(6) Container valves and accessories.

(a) Valves in the assembly of multiple container systems shall be arranged so that replacement of containers can be made without shutting off the flow of gas in the system.

Note: This provision is not to be construed as requiring an automatic changeover device.

(b) Regulators and low-pressure relief devices shall be rigidly attached to the cylinder valves, cylinders, supporting standards, the building walls or otherwise rigidly secured and shall be so installed or protected that the elements (sleet, snow, or ice) will not affect their operation.

(c) Valves and connections to the containers shall be protected while in transit, in storage, and while being moved into final utilization, as follows:

(i) By setting into the recess of the container to prevent the possibility of their being struck if the container is dropped upon a flat surface, or

(ii) By ventilated cap or collar, fastened to the container capable of withstanding a 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 the valve or other connection.

(d) When containers are not connected to the system, the outlet valves shall be kept tightly closed or plugged, even though containers are considered empty.

(e) Containers having a water capacity in excess of fifty pounds (approximately twenty-one pounds LP-gas capacity), recharged at the installation, shall be provided with excess flow or backflow check valves to prevent the discharge of container contents in case of failure of the filling or equalizing connection.

(7) Safety devices.

(a) Containers shall be provided with safety devices as required by DOT regulations.

(b) A final stage regulator of an LP-gas system (excluding any appliance regulator) shall be equipped on the low-pressure side with a relief valve which is set to start to discharge within the limits specified in Table H-30.

TABLE H-30

Regulator delivery pressure	Relief valve start to discharge pressure setting (percent of regulator deliver pressure)	
	Minimum	Maximum
1 p.s.i.g. or less	200	300
Above 1 p.s.i.g. but not over 3 p.s.i.g.	140	200
Above 3 p.s.i.g.	125	200

(c) When a regulator or pressure relief valve is used inside a building for other than purposes specified in WAC 296-24-47505 (6)(a)(i) through (vi), the relief valve and the space above the regulator and relief valve diaphragms shall be vented to the outside air with the discharge outlet located not less than three feet horizontally away from any building opening which is below such discharge. These provisions do not apply to individual appliance regulators when protection is otherwise provided nor to subsection (5) of this section and WAC 296-24-47505 (10)(n). In buildings devoted exclusively to gas distribution purposes, the space above the diaphragm need not be vented to the outside.

(8) Reinstallation of containers. Containers shall not be reinstalled unless they are requalified in accordance with DOT regulations.

Permissible product. A product shall 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.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-47507, filed 11/14/88; Order 73-5, § 296-24-47507, filed 5/9/73 and Order 73-4, § 296-24-47507, filed 5/7/73.]

WAC 296-24-47513 Storage of containers awaiting use or resale. (1) Application. This section shall apply to the storage of portable containers not in excess of one thousand 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 shall 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.

(2) General.

(a) Containers in storage shall be located so as to minimize exposure to excessive temperature rise, physical damage, or tampering by unauthorized persons.

(b) Containers when stored inside shall not be located near exits, stairways, or in areas normally used or intended for the safe exit of people.

(c) Container valves shall be protected while in storage as follows:

(i) By setting into recess of container to prevent the possibility of their being struck if the container is dropped upon a flat surface, or

(ii) 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.

(d) The outlet valves of containers in storage shall be closed.

(e) Empty containers which have been in LP-gas service should preferably be stored in the open. When stored inside, they shall be considered as full containers for the purpose of determining the maximum quantity of LP-gas permitted by this section.

(3) Storage within buildings frequented by the public.

(a) DOT specification containers having a maximum individual water capacity of two and one-half pounds, used with completely self-contained hand torches and similar applications, are permitted to be stored or displayed in a building frequented by the public. The display of such containers shall be limited to a total of twenty-four units of each brand and size. The total quantity on display and in storage shall not exceed two hundred pounds LP-gas.

(b) Storage as provided in subsection (5) of this section shall not be permitted within or attached to such a building.

(4) Storage within buildings not frequented by the public (such as industrial buildings).

(a) The quantity of LP-gas stored shall not exceed three hundred pounds (approximately two thousand five hundred fifty cubic feet in vapor form) except as provided in subsection (5) of this section.

(b) Containers carried as a part of service equipment on highway mobile vehicles are not to be considered in the total storage capacity in (a) of this subsection provided such vehicles are stored in private garages, and are

limited to one container per vehicle with an LP-gas capacity of not more than one hundred pounds. All container valves shall be closed.

(5) Storage within special buildings or rooms.

(a) The quantity of LP-gas stored in special buildings or rooms shall not exceed ten thousand pounds.

(b) The walls, floors, and ceilings of container storage rooms that are within or adjacent to other parts of the building shall be constructed of material having at least a two-hour fire resistance rating.

(c) A portion of the exterior walls or roof having an area not less than ten percent of that of the combined area of the enclosing walls and roof shall be of explosion relieving construction.

(d) Each opening from such storage rooms to other parts of the building shall be protected by a one and one-half-hour "(B)" fire door listed by a nationally recognized testing laboratory. Refer to federal regulation 29 CFR 1910.7 for definition of nationally recognized testing laboratory.

(e) Such rooms shall have no open flames for heating or lighting.

(f) Such rooms shall be adequately ventilated both top and bottom to the outside only. The openings from such vents shall be at least five feet away from any other opening into any building.

(g) The floors of such rooms shall not be below ground level. Any space below the floor shall be of solid fill or properly ventilated to the open air.

(h) Such storage rooms shall not be located adjoining the line of property occupied by schools, churches, hospitals, athletic fields or other points of public gathering.

(i) Fixed electrical equipment shall be installed in accordance with WAC 296-24-47505(18).

(6) Storage outside of buildings.

(a) Storage outside of buildings, for containers awaiting use or resale, shall be located in accordance with Table H-33 with respect to:

(i) The nearest important building or group of buildings;

(ii) The line of adjoining property which may be built upon;

(iii) Busy thoroughfares;

(vi) The line of adjoining property occupied by schools, churches, hospitals, athletic fields, or other points of public gathering.

TABLE H-33

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

*Container or containers shall be at least ten feet from any building on adjoining property, any sidewalk, or any of the exposures described in (a)(iii) or (iv) of this subsection.

(b) Containers shall be in a suitable enclosure or otherwise protected against tampering.

(7) Fire protection. Storage locations other than supply depots separated and located apart from dealer, reseller, or user establishments shall be provided with at least one approved portable fire extinguisher having a minimum rating of 8-B, C.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-47513, filed 11/14/88. Statutory Authority: RCW 49-17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-24-47513, filed 11/13/80; Order 76-6, § 296-24-47513, filed 3/1/76; Order 73-5, § 296-24-47513, filed 5/9/73 and Order 73-4, § 296-24-47513, filed 5/7/73.]

Part F-2

STORAGE AND HANDLING OF ANHYDROUS AMMONIA

WAC

296-24-51009 Basic rules.

296-24-51013 Refrigerated storage.

WAC 296-24-51009 Basic rules. This section applies to all sections of this chapter which include WAC 296-24-510 in the section number unless otherwise noted.

(1) Approval of equipment and systems. Each appurtenance shall be approved in accordance with (a), (b), (c), and (d) of this subsection.

(a) It was installed before February 8, 1973 and was approved and tested, and installed in accordance with either the provisions 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

(b) It is accepted, or certified, or listed, or labeled, or otherwise determined to be safe by a nationally recognized testing laboratory; or

(c) It is a type which no nationally recognized testing laboratory does, or will undertake to accept, certify, list, label, or determine to be safe; and such equipment is inspected or tested by any federal, state, municipal, or other local authority responsible for enforcing occupational safety provisions of a federal, state, municipal or other local law, code, or regulation pertaining to the storage, handling, transport, and use of anhydrous ammonia, and found to be in compliance with either the provisions 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

(d) It is a custom-designed and custom-built unit, which no nationally recognized testing laboratory, or federal, state, municipal or local authority responsible for the enforcement of a federal, state, municipal, or local law, code or regulation pertaining to the storage, transportation and use of anhydrous ammonia is willing to undertake to accept, certify, list, label or determine to be safe, and the employer has on file a document attesting to its safe condition following the conduct of appropriate tests. The document shall be signed by a registered professional engineer or other person having special training or experience sufficient to permit

him/her to form an opinion as to safety of the unit involved. The document shall set forth the test bases, test data and results, and also the qualifications of the certifying person.

(e) For the purposes of this section the word "listed" means that equipment is of a kind mentioned in a list which is published by a nationally recognized laboratory which makes periodic inspection of the production of such equipment, and states such equipment meets nationally recognized standards or has been tested and found safe for use in a specified manner. "Labeled" means there is attached to it a label, symbol, or other identifying mark of a nationally recognized testing laboratory which makes periodic inspections of the production of such equipment, and whose labeling indicates compliance with nationally recognized standards or tests to determine safe use in a specified manner. "Certified" means it has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards or to be safe for use in a specified manner, or is of a kind whose production is periodically inspected by a nationally recognized testing laboratory, and it bears a label, tag, or other record of certification.

(f) For purposes of this section, refer to federal regulation 29 CFR 1910.7 for definition of nationally recognized testing laboratory.

(2) Requirements for construction, original test and requalification of not-refrigerated containers.

(a) Containers used with systems covered in WAC 296-24-51011 and 296-24-51017 through 296-24-51021 shall be constructed and tested in accordance with the code except that construction under Table UW-12 at a basic joint efficiency of under eighty percent is not authorized.

Containers built according to the code do not have to comply with paragraphs UG-125 to UG-128, inclusive, and paragraphs UG-132 and UG-133 of the code.

(b) Containers exceeding thirty-six inches in diameter or two hundred fifty gallons water capacity shall be constructed to comply with one or more of the following:

(i) Containers shall be stress relieved after fabrication in accordance with the code, or

(ii) Cold-formed heads, when used, shall be stress relieved or,

(iii) Hot-formed heads shall be used.

(c) Welding to the shell, head, or any other part of the container subject to internal pressure shall be done in compliance with WAC 296-24-51005(5). Other welding is permitted only on saddle plates, lugs, or brackets attached to the container by the container manufacturer.

(d) Containers used with systems covered by subsection (3)(b)(iv) of this section shall be constructed and tested in accordance with the DOT specifications.

(e) The provisions of (a) of this subsection shall not be construed as prohibiting the continued use or reinstallation of containers constructed and maintained in accordance with 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.

(3) Markings on nonrefrigerated containers and systems other than DOT containers.

(a) System nameplates, when required, shall be permanently attached to the system so as to be readily accessible for inspection and shall include markings as prescribed in (b) of this subsection.

(b) Each container or system covered in WAC 296-24-51011, 296-24-51017, 296-24-51019 and 296-24-51021 shall be marked as specified in the following:

(i) With a marking identifying compliance with the rules of the code under which the container is constructed.

(ii) With a notation on the container and system nameplate when the system is designed for underground installation.

(iii) With the name and address of the supplier of the container or the trade name of the container and with the date of fabrication.

(iv) With the water capacity of the container in pounds at 60°F or gallons, United States standard.

(v) With the design pressure in pounds per square inch gage.

(vi) With the wall thickness of the shell and heads.

(vii) With marking indicating the maximum level to which the container may be filled with liquid anhydrous ammonia at temperatures between 20°F and 100°F except on containers provided with fixed maximum level indicators, such as fixed length dip tubes, or containers that are filled by weight. Markings shall be in increments of not more than 20°F.

(viii) With the outside surface area in square feet.

(ix) With minimum temperature in Fahrenheit for which the container is designed.

(x) Marking specified on container shall be on the container itself or on a nameplate permanently affixed thereto.

(c) All main operating valves on permanently installed containers having a capacity of over three thousand water gallons shall be identified to show whether the valve is in liquid or vapor service. The recommended method of identification may be legend or color code as specified in (c)(i) and (ii) of this subsection:

(i) Legend: The legend LIQUID (or LIQUID VALVE), VAPOR (or VAPOR VALVE), as appropriate, shall be placed on or within twelve inches of the valve by means of a stencil tag, or decal.

(ii) Color code: Liquid valves shall be painted orange and vapor valves shall be painted yellow. The legend ORANGE-LIQUID, YELLOW-VAPOR shall be displayed in one or more conspicuous places at each permanent storage location. The legend shall have letters at least two inches high and shall be placed against a contrasting background. This is in accordance with American National Standard A13.1 "Schemes for Identification of Piping Systems"—1956, Page 5.

(4) Marking refrigerated containers. (See WAC 296-24-51013(3). Marking refrigerated containers.)

(5) Location of containers.

(a) Consideration shall be given to the physiological effects of ammonia as well as to adjacent fire hazards in selecting the location for a storage container. Containers

shall be located outside of buildings or in buildings or sections thereof especially approved for this purpose.

(b) Containers shall 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.

(c) The location of permanent storage containers shall be outside densely populated areas.

(d) Container locations shall comply with the following table:

Nominal Capacity of Container	Minimum Distances (feet) from Container to:			
	Line of Adjoining Property Which may be Built upon, Highways & Mainline 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	

(e) Storage areas shall be kept free of readily ignitable materials such as waste, weeds and long dry grass.

(6) Container appurtenances.

(a) All appurtenances shall be designed for not less than the maximum working pressure of that portion of the system on which they are installed. All appurtenances shall be fabricated from materials proved suitable for anhydrous ammonia service.

(b) All connections to containers except safety relief devices, gaging devices, or those fitted with a No. 54 drill size orifice shall have shutoff valves located as close to the container as practicable.

(c) Excess flow valves where required by these standards shall close automatically at the rated flows of vapor or liquid as specified by the manufacturer. The connections and line including valves and fittings being protected by an excess flow valve shall have a greater capacity than the rated flow of the excess flow valve.

(d) Liquid level gaging devices that require bleeding of the product to the atmosphere and which are so constructed that outward flow will not exceed that passed by a No. 54 drill size opening need not be equipped with excess flow valves.

(e) Openings from container or through fittings attached directly on container to which pressure gage connections are made need not be equipped with excess flow valves if such openings are not larger than No. 54 drill size.

(f) Excess flow and back pressure check valves where required by these standards shall be located inside of the container or at a point outside as close as practicable to where the line enters the container. In the latter case, installation shall be made in such manner that any undue stress beyond the excess flow or back pressure check valve will not cause breakage between the container and the valve.

(g) Excess flow valves shall be designed with a bypass, not to exceed a No. 60 drill size opening to allow equalization of pressures.

(h) Shutoff valves provided with an excess flow valve shall be designed for proper installation in a container connection so that the excess flow valve will close should the shutoff valve break.

(i) All excess flow valves shall be plainly and permanently marked with the name or trademark of the manufacturer, the catalog number, and the rated capacity.

(7) Piping, tubing and fittings.

(a) All piping, tubing and fittings shall be made of material suitable for anhydrous ammonia service.

(b) All piping, tubing and fittings shall be designed for a pressure not less than the maximum pressure to which they may be subjected in service.

(c) All piping shall be well supported and provision shall be made for expansion and contraction. All refrigeration system piping shall 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.

(d) Piping used on nonrefrigerated systems shall be at least ASTM A-53-1969 Grade B Electric Resistance Welded and Electric Flash Welded Pipe or equal. Such pipe shall be at least Schedule 40 when joints are welded, or welded and flanged. Such pipe shall be at least Schedule 80 when joints are threaded. Brass, copper, or galvanized steel pipe or tubing shall not be used.

(e) All metal flexible connections for permanent installations shall have a minimum working pressure of 250 p.s.i.g. (safety factor of 4). For temporary installations, hose meeting the requirement of subsection (8) of this section may be used.

(f) Cast iron fittings shall not be used but this shall not prohibit the use of fittings made specially for ammonia service of malleable or nodular iron such as Specification ASTM A47 or ASTM A395.

(g) Provisions shall be made for expansion, contraction, jarring, vibration, and for settling.

(h) Adequate provisions shall be made to protect all exposed piping from physical damage that might result from moving machinery, the presence of automobiles or trucks, or any other undue strain that may be placed upon the piping.

(i) Joint compounds shall be resistant to ammonia.

(j) After assembly, all piping and tubing shall be tested and proved to be free from leaks at a pressure not less than the normal operating pressure of the system.

(8) Hose specification.

(a) Hose used in ammonia service and subject to container pressure shall conform to the joint Rubber Manufacturers Association and the Fertilizer Institute "Hose Specifications for Anhydrous Ammonia" (see Appendix B).

(b) Hose subject to container pressure shall be designed for a minimum working pressure of 350 p.s.i.g. and a minimum burst pressure of 1750 p.s.i.g. Hose assemblies, when made up, shall be capable of withstanding a test pressure of 500 p.s.i.g.

(c) Hose and hose connections located on the low pressure side of flow control or pressure reducing valves on devices discharging to atmospheric pressure shall be designed for the maximum low side working pressure.

All connections shall be designed, constructed, and installed so that there will be no leakage when connected.

(d) Where liquid transfer hose is not drained of liquid upon completion of transfer operations, such hose shall be equipped with an approved shutoff valve at the discharge end. Provision shall be made to prevent excessive hydrostatic pressure in the hose. (See subsection (9)(j) of this section.)

(e) On all hose one-half inch O.D. and larger, used for the transfer of anhydrous ammonia liquid or vapor, there shall be etched, cast, or impressed at five-foot intervals the following information:

"Anhydrous Ammonia"
xxx p.s.i.g. (Maximum working pressure)
Manufacturer's Name or Trademark
Year of Manufacture

(9) Safety relief devices.

(a) Every container used in systems covered by WAC 296-24-51011, 296-24-51017, 296-24-51019 and 296-24-51021 shall be provided with one or more safety relief valves of the spring-loaded or equivalent type. The discharge from safety relief valves shall be vented away from the container, upward and unobstructed to the atmosphere. All safety relief valve discharge openings shall have suitable raincaps that will allow free discharge of the vapor and prevent the entrance of water. Provision shall be made for draining condensate which may accumulate. The rate of the discharge shall be in accordance with the provisions of Appendix A.

(b) Container safety relief valves shall be set to start-to-discharge as follows, with relations 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: A relief valve manufacturer's tolerance of plus ten percent is permitted.

(c) Safety relief devices used in systems covered by WAC 296-24-51011, 296-24-51017, 296-24-51019 and 296-24-51021 shall be constructed to discharge at not less than the rates required in (a) of this subsection before the pressure is in excess of one hundred twenty percent (not including the ten percent tolerance referred to in (b) of this subsection) of the maximum permitted start-to-discharge pressure setting of the device.

(d) Safety relief valves shall be so arranged that the possibility of tampering will be minimized. If the pressure setting adjustment is external, the relief valves shall be provided with means for sealing the adjustment.

(e) Shutoff valves shall not be installed between the safety relief valves and the containers or systems described in WAC 296-24-51011, 296-24-51017, 296-24-51019 and 296-24-51021, except that a shutoff

valve may be used where the arrangement of this valve is such as always to afford required capacity flow through the relief valves.

Note: The above exception is made to cover such cases as a threeway valve installed under two safety relief valves, each of which has the required rate of discharge and is so installed as 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. Another exception to this may be where two separate relief valves are installed with individual shutoff valves. In this case, the two shutoff valve stems shall be mechanically interconnected in a manner which will allow full required flow of one safety relief valve at all times. Still another exception is a safety relief valve manifold which 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.

(f) Safety relief valves shall have direct communication with the vapor space of the container.

(g) Each safety relief valve used with systems described in WAC 296-24-51011, 296-24-51017, 296-24-51019 and 296-24-51021 shall be plainly and permanently marked as follows:

- (i) With the letters "AA" or the symbol "NH3."
- (ii) The pressure in pounds per square inch gage (p.s.i.g.) at which the valve is set to start-to-discharge.
- (iii) The rate of discharge of the valve in cubic feet per minute of air at 60°F and atmospheric pressure (14.7 p.s.i.a.).
- (iv) The manufacturer's name and catalog number.

For example, a safety relief valve marked AA-250-4200 (air) would mean that this valve is suitable for use on an anhydrous ammonia container; that it is set to start-to-discharge at 250 p.s.i.g.; and that its rate of discharge (see subsection (8)(a) through (c) of this section) is four thousand two hundred cubic feet per minute of air.

(h) The flow capacity of the safety relief valve shall not be restricted by any connection to it on either the upstream or downstream side.

(i) The manufacturer or supplier of a safety relief valve manifold shall publish complete data showing the flow rating through the combined assembly of the manifold with safety relief valves installed. The manifold flow rating shall be determined by testing the manifold with all but one valve discharging. If one or more openings have restrictions not present in the remaining openings, the restricted opening or openings or those having the lowest flow shall be used to establish the flow rate marked on the manifold nameplate. The marking shall be similar to that required in (g) of this subsection for individual valves.

(j) A hydrostatic relief valve shall be installed between each pair of valves in the liquid ammonia piping or hose where liquid may be trapped so as to relieve into the atmosphere at a safe location.

(k) Discharge from safety relief devices shall not terminate in or beneath any building.

(10) Safety. See CGA Pamphlet G-2, TFI Operational Safety Manual M-2 and MCA Safety Data Sheet SD-8 (see Appendix C for availability).

(a) Personnel required to handle ammonia shall be trained in safe operating practices and the proper action

to take in the event of emergencies. Personnel shall be instructed to use the equipment listed in (c) of this subsection in the event of an emergency. (Rev. 1-22-76)

(b) If a leak occurs in an ammonia system, the personnel trained for and designated to act in such emergencies shall:

(i) See that persons not required to deal with an emergency are evacuated from the contaminated area.

(ii) Put on a suitable gas mask.

(iii) Wear gauntlet type plastic or rubber gloves and wear plastic or rubber suits in heavily contaminated atmospheres.

(iv) Shut off the appropriate valves.

(c) All storage systems shall have on hand, as a minimum, the following equipment for emergency and rescue purposes:

* (i) One full face gas mask with anhydrous ammonia refill canisters.

** (ii) One pair of protective gloves.

** (iii) One pair of protective boots.

** (iv) One protective slicker and/or protective pants and jacket.

(v) Easily accessible shower and/or at least fifty gallons of clean water in an open top container.

(vi) Tight fitting vented goggles or one full face shield.

*An ammonia canister is effective for short periods of time in light concentrations of ammonia vapor, generally fifteen minutes in concentrations of three percent and will not protect breathing in heavier concentrations. If ammonia vapors are detected when mask is applied the concentration is too high for safety. The life of a canister in service is controlled by the percentage of vapors to which it is exposed. Canisters must not be opened until ready for use and should be discarded after use. Unopened canisters may be guaranteed for as long as three years. All should be dated when received because of this limited life. In addition to this protection, an independently supplied air mask of the type used by fire departments may be used for severe emergencies.

**Gloves, boots, slickers, jackets and pants shall be made of rubber or other material impervious to ammonia.

(d) Where several persons are usually present, additional safety equipment may be desirable.

(e) Each tank motor vehicle transporting anhydrous ammonia, except farm applicator vehicles, shall carry a container of at least five gallons of water and shall be equipped with a full face gas mask, a pair of tight-fitting goggles or one full face shield. The driver shall be instructed in their use and the proper action to take to provide for his/her safety.

(f) If a leak occurs in transportation equipment and it is not practical to stop the leak, the driver should move the vehicle to an isolated location away from populated communities or heavily traveled highways.

(g) 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 shall treat all cases of eye exposure to liquid ammonia.

(11) Filling densities. (See WAC 296-24-51005(9).)

(a) The filling densities for nonrefrigerated containers shall not exceed the following:

Aboveground Underground

- | | | |
|--------------------------------------------------------------------------|------|-----|
| (i) Uninsulated | 56%* | 58% |
| (ii) Insulated | 57% | |
| (iii) DOT containers shall be filled in accordance with 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.

(b) The filling density for refrigerated storage tanks temperature corresponding to the vapor pressure at the start-to-discharge pressure setting of the safety relief valve.

(c) If containers are to be filled according to liquid level by any gaging method other than a fixed length dip tube gage, each container should have a thermometer well so that the internal liquid temperature can be easily determined and the amount of liquid and vapor in the container corrected to a 60°F basis.

(12) Transfer of liquids.

(a) Anhydrous ammonia shall 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.

(b) At least one attendant shall supervise the transfer of liquids from the time the connections are first made until they are finally disconnected.

(c) Flammable gases or gases which will react with ammonia (such as air) shall not be used to unload tank cars or transport trucks.

(d) Containers shall be charged or used only upon authorization of the owner.

(e) Containers shall be gaged and charged only in the open atmosphere or in buildings approved for that purpose.

(f) Pumps used for transferring ammonia shall be recommended and labeled for ammonia service by the manufacturer.

(i) Pumps shall be designed for at least 250 p.s.i.g. working pressure.

(ii) Positive displacement pumps shall have installed, off the discharge port, a constant differential relief valve discharging into the suction port of the pump through a line of sufficient size to carry the full capacity of the pump at relief valve setting, which setting and installation shall be according to pump manufacturer's recommendations.

(iii) On the discharge side of the pump, before the relief valve line, there shall be installed a pressure gage graduated from 0 to 400 p.s.i.g.

(iv) Plant piping shall contain shutoff valves located as close as practical to pump connections.

(g) Compressors used for transferring or refrigerating ammonia shall be recommended and labeled for ammonia service by the manufacturer.

(i) Compressors, except those used for refrigeration, shall be designed for at least 250 p.s.i.g. working pressure. Crank cases of compressors not designed to withstand system pressure shall be protected with a suitable safety relief valve.

(ii) Plant piping shall contain shutoff valves located as close as practical to compressor connections.

(iii) A safety relief valve large enough to discharge the full capacity of the compressor shall be connected to the discharge before any shutoff valve.

(iv) Compressors shall have pressure gages at suction and discharge graduated to at least one and one-half times the maximum pressure that can be developed.

(v) Adequate means, such as drainable liquid trap, may be provided on the compressor suction to minimize the entry of liquid into the compressor.

(vi) Where necessary to prevent contamination, an oil separator shall be provided on the discharge side of the compressor.

(h) Loading and unloading systems shall be protected by suitable devices to prevent emptying of the storage container or the container being loaded or unloaded in the event of severance of the hose. Backflow check valves or properly sized excess flow valves shall be installed where necessary to provide such protection. In the event that such valves are not practical, remotely operated shutoff valves may be installed.

(i) Meters used for the measurement of liquid anhydrous ammonia shall be recommended and labeled for ammonia service by the manufacturer.

(i) Liquid meters shall be designed for a minimum working pressure of 250 p.s.i.g.

(ii) The metering system shall incorporate devices that will prevent the inadvertent measurement of vapor.

(13) Tank car unloading points and operations.

(a) Provisions for unloading tank cars shall conform to the regulations of the department of transportation.

(b) Unloading operations shall be performed by reliable persons properly instructed and made responsible for careful compliance with all applicable procedures.

(c) Caution signs shall be so placed on the track or car as to give necessary warning to persons approaching car from open end or ends of siding and shall be left up until after car is unloaded and disconnected from discharge connections. Signs shall be of metal or other suitable material, at least twelve by fifteen inches in size and bear the words "STOP—Tank car connected" or "STOP—Men at work" the word "STOP," being in letters at least four inches high and the other words in letters at least two inches high. The letters shall be white on a blue background.

(d) The track of a tank car siding shall be substantially level.

(e) Brakes shall be set and wheels blocked on all cars being unloaded.

(f) Tank cars of anhydrous ammonia shall be unloaded only at approved locations meeting the requirements of subsections (9)(c) and (12)(h) of this section.

(14) Liquid level gaging device.

(a) Each container except those filled by weight shall be equipped with an approved liquid level gaging device.

(b) All gaging devices shall be arranged so that the maximum liquid level to which the container is filled is readily determined. (See subsection (4)(b)(vii) of this section.)

(c) Gaging devices that require bleeding of the product to the atmosphere such as the rotary tube, fixed tube, and slip tube devices, shall be designed so that the maximum opening of the bleed valve is not larger than No. 54 drill size unless provided with an excess flow valve. (This requirement does not apply to farm vehicles used for the application of ammonia as covered in WAC 296-24-51021.)

(d) Gaging devices shall have a design pressure equal to or greater than the design pressure of the container on which they are installed.

(e) Fixed liquid level gages shall be so designed that the maximum volume of the container filled by liquid shall not exceed eighty-five percent of its water capacity. The coupling into which the fixed liquid level gage is threaded must be placed at the eighty-five percent level of the container. If located elsewhere, the dip tube of this gage must be installed in such a manner that it cannot be readily removed.

Note: This does not apply to refrigerated storage.

(f) Gage glasses of the columnar type shall be restricted to stationary storage installation. They shall be equipped with shutoff valves having metallic handwheels, with excess-flow valves, and with extra heavy glass adequately protected with a metal housing applied by the gage manufacturer. They shall be shielded against the direct rays of the sun.

(15) Painting of containers. Aboveground uninsulated containers should have a reflective surface maintained in good condition. White is recommended for painted surfaces, but other light reflecting colors are acceptable.

(16) Electrical equipment and wiring.

(a) Electrical equipment and wiring for use in ammonia installations shall be general purpose or weather resistant as appropriate.

(b) Where concentrations of ammonia in air in excess of sixteen percent by volume are likely to be encountered, electrical equipment and wiring shall be of a type specified by and be installed in accordance with National Electrical Code, NFPA 70 (ANSI-C1), for Class I, Group D locations.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-51009, filed 11/14/88. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-24-51009, filed 11/13/80; Order 76-6, § 296-24-51009, filed 3/1/76; Order 74-27, § 296-24-51009, filed 5/7/74; Order 73-5, § 296-24-51009, filed 5/9/73 and Order 73-4, § 296-24-51009, filed 5/7/73.]

WAC 296-24-51013 Refrigerated storage. This section applies specifically to systems utilizing tanks for the storage of anhydrous ammonia under refrigerated conditions. All basic rules of WAC 296-24-51009 apply to this section unless inconsistent with the requirements of this section.

(1) Design of tanks.

(a) Tanks may be designed for any storage pressure desired as determined by economical design of the refrigerated system.

(b) The design temperature shall be the minimum temperature to which the container will be refrigerated and shall be so designated.

(c) Containers with a design pressure exceeding 15 p.s.i.g. shall be constructed in accordance with WAC 296-24-51009(2) and the material shall be selected from those listed in API Standards 620, 4th edition 1970, Recommended Rules for Design and Construction of Large, Welded Low-Pressure Storage Tanks, Tables 2.02, R.2.1, R.2.2, R.2.3 or R.2.4.

(d) Tanks with a design pressure of 15 p.s.i.g. and less shall be constructed in accordance with the general requirements of API Standard 620, 4th edition, 1970, including Appendix R.

(e) When austenitic steels or nonferrous materials are used, the ASME Code shall be used as a guide in selection of materials for use at the design temperature.

(f) The filling density for refrigerated storage containers shall be such that the container will not be liquid full at a liquid temperature corresponding to the vapor pressure at the start-to-discharge pressure setting of the safety-relief valve. (New 1-22-76)

(2) Installation of storage tanks.

(a) Tanks shall be supported on suitable noncombustible foundations designed to accommodate the type of tank being used.

(b) Adequate protection against flotation or other water damage shall be provided wherever high flood water might occur.

(c) Tanks for product storage at less than 32°F shall be supported in such a way, or heat shall be supplied, to prevent the effects of freezing and consequent frost heaving.

(d) The area surrounding a refrigerated tank or group of tanks shall be provided with drainage, or shall be diked to prevent accidental discharge of liquid from spreading to uncontrolled areas.

(e) When drainage is employed, a slope of not less than one percent shall be provided. The drainage system shall terminate in an impounding basin having a capacity as large as the largest tank served.

(f) Provision shall be made for drainage of rain water from the diked or impounding area. Such drainage shall not permit the release of ammonia.

(g) When a dike surrounding the tank is employed, the capacity of the diked enclosure shall be as large as the largest tank served.

(h) The walls of a diked enclosure or the wall of an impounding basin used in a drainage system shall be of earth, steel or concrete designed to be liquid tight and to withstand the hydrostatic pressure and the temperature. Earth walls shall have a flat top at least 2 feet wide. The slope shall be stable and consistent with the angle of repose of the earth used.

(i) The ground in an impounding basin or within a diked enclosure, should be graded so that small spills, or the early part of a large spill, will accumulate at one side or corner contacting a relatively small area of ground

and exposing a relatively small surface area for heat gain. Shallow channels in the ground surface or low curbs of earth can help guide the liquid to these low areas without contacting a large ground area.

(3) Marking refrigerated containers.

Each refrigerated container shall be marked with a nameplate on the outer covering in an accessible place as specified in the following:

- (a) With the name and address of the builder and the date of fabrication.
- (b) With the maximum volume or weight of the product whichever is most meaningful to user.
- (c) With the design pressure.
- (d) With the minimum temperature in degrees Fahrenheit for which the container was designed.
- (e) With the maximum allowable water level to which the container may be filled for the test purposes.
- (f) With the density of the product in pounds per cubic foot for which the container was designed.
- (g) With the maximum level to which the container may be filled with liquid anhydrous ammonia.
- (4) Tank valves, fill pipes and discharge pipes.
 - (a) Shut-off valves shall be:
 - (i) Provided for all connections except those with a No. 54 drill size restriction, plugs, safety valves, thermometer wells, and
 - (ii) Located as close to the tank as practicable.
 - (b) When operating conditions make it advisable, a check valve shall be installed on the fill connection and a remotely operated shut-off valve on other connections located below the maximum liquid level.

(5) Safety relief devices.

- (a) Safety relief valves shall be set to start-to-discharge at a pressure not in excess of the design pressure of the tank and shall have a total relieving capacity sufficient to prevent a maximum pressure in a tank of more than one hundred twenty percent of the design pressure.
- (b) The total relieving capacity shall be the larger requirement of (b)(i) or (ii) of this subsection.

(i) Possible refrigeration system upset such as (A) cooling water failure, (B) power failure, (C) instrument air or instrument failure, (D) mechanical failure of any equipment, (E) excessive pumping rates, (F) changing atmospheric conditions.

(ii) Either one of the following formulas for fire exposure, (A) for valve manufacturers who use weight of vapors to be relieved as basis for classifying valves:

$$W = \frac{34,500 F A^{0.82}}{L}$$

or (B) for valve manufacturers that classify valves on the basis of air flow:

$$Q_a = \frac{633,000 F A^{0.82}}{L C} \sqrt{\frac{Z T}{M}}$$

Where

- W = weight of vapors to be relieved in pounds/hour at relieving conditions;
- Q_a = air flow in cubic feet per minute at standard conditions (60F and 14.7 psi);
- F = fireproofing credit. Use F = 1.0 except when an approved fireproofing material of recommended thickness is used, then use F = 0.2.
- A = total surface area in square feet up to 25 feet above grade or to the equator of a sphere, whichever is greater;
- Z = compressibility factor of ammonia at relieving conditions (if not known, use Z = 1.0);
- T = temperature in degrees R (460 + temperature in degrees F of gas at relieving conditions);
- M = molecular weight = 17 for ammonia;
- L = latent heat of ammonia at relieving conditions;
- C = constant based on relation of specific heats. (C may be obtained from the following table.)

(If K is not known use C = 315.)

K	C	K	C	K	C
1.00	315	1.26	343	1.52	366
1.02	318	1.28	345	1.54	368
1.04	320	1.30	347	1.56	369
1.06	322	1.32	349	1.58	371
1.08	324	1.34	351	1.60	372
1.10	327	1.36	352	1.62	374
1.12	329	1.38	354	1.64	376
1.14	331	1.40	356	1.66	377
1.16	333	1.42	358	1.68	379
1.18	335	1.44	359	1.70	380
1.20	337	1.46	361	2.00	400
1.22	339	1.48	363	2.20	412
1.24	341	1.50	364		

Where K = C_p/C_v at atmospheric conditions and

- C_p = specific heat of vapor at constant pressure.
- C_v = specific heat of vapor at constant volume.

(c) Shut-off valves of adequate flow capacity may be provided and used to facilitate inspection and repair of safety relief valves. When a shut-off valve is provided it shall be so arranged that it can be locked or sealed open, and it shall not be closed except by an authorized person who shall remain stationed there while the valve remains closed, and who shall again lock or seal the valve open when leaving the station.

(d) Safety relief devices shall comply with the following:

(i) If stacks are used they shall be suitably designed to prevent obstruction by rain, snow, ice or condensate. The outlet size shall not be smaller than the nominal size of the safety relief valve outlet connection.

(ii) Discharge lines may be used if desired. Multiple safety relief valves on the same storage unit may be run into a common discharge header. The discharge line and header shall be designed to accommodate the maximum flow and a back pressure not exceeding ten percent of the design pressure of the storage container. This back pressure shall be included in the one hundred twenty percent total maximum pressure given in (a) of this subsection. No other container or system shall exhaust into this discharge line or header. The vent lines shall be installed to prevent accumulation of liquid in the lines.

(c) Atmospheric storage shall be provided with vacuum breakers. Ammonia gas may be used to provide a pad.

(6) Protection of container appurtenances. Refrigerated storage containers shall comply with the provisions of WAC 296-24-51011(7).

(7) Reinstallation of containers. Containers of such size as to require field fabrication shall, when moved and reinstalled, be reconstructed and reinspected in complete accordance with the code under which they were constructed. The containers shall be subjected to a pressure retest, and if rerating is necessary, it shall be done in accordance with the applicable code pressures.

(8) Damage from vehicles. Precaution shall be taken to avoid any damage by trucks, tractors, or other vehicles.

(9) Refrigeration load and equipment.

(a) The total refrigeration load shall be computed as the sum of the following:

(i) Load imposed by heat flow into the container caused by the temperature differential between the ambient temperature and the design storage temperature.

(ii) Load imposed by heat flow into the tank caused by maximum sun radiation.

(iii) Maximum load imposed by filling the tank with ammonia warmer than the design storage temperature.

(b) More than one storage tank may be handled by the same refrigeration system.

(c) Compressors. (See also WAC 296-24-51009 (12)(g).)

(i) A minimum of two compressors shall be provided, either of which is of sufficient size to handle the loads listed in (a)(i) and (ii) of this subsection. Where more than two compressors are provided, minimum standby equipment equal to the largest normally operating equipment shall be installed. Compressors required for (a)(iii) of this subsection may be used as standby equipment for compressors required in (a)(i) and (ii) of this subsection.

(ii) Compressors shall be sized to operate with a suction pressure at least ten percent below the minimum setting of the safety relief valve(s) on the storage tank and shall withstand a suction pressure at least equal to one hundred twenty percent of the design pressure of the tank. Discharge pressure will be governed by condensing conditions.

(d) Compressor drives.

(i) Each compressor shall have its individual driving unit.

(ii) Any standard drive consistent with good design may be used.

(iii) An emergency source of power of sufficient capacity to handle the loads listed in (a)(i) and (ii) of this subsection shall be provided, unless facilities are provided to safely dispose of vented vapors while the refrigeration system is not operating.

(e) Automatic control equipment.

(i) The refrigeration system shall be arranged with suitable controls to govern the compressor operation in accordance with the load as evidenced by the pressure in the container(s).

(ii) An emergency alarm system shall be installed to function in the event the pressure in the container(s) rises to the maximum or falls to the minimum allowable operating pressure.

(iii) An emergency alarm and shut-off shall be located in the condenser system to respond to excess discharge pressure caused by failure of the cooling medium.

(iv) All automatic controls shall be installed in a manner to preclude operation of alternate compressors unless the controls will function with the alternate compressors.

(f) Separators.

(i) An entrainment separator of suitable size and design pressure shall be installed in the compressor suction line. The separator shall be equipped with a drain and gaging device.

(ii) An oil separator of suitable size shall be installed in the compressor discharge line. It shall be designed for at least 250 p.s.i.g. and shall be equipped with a gaging device and drain valve.

(g) Condensers. The condenser system may be cooled by air or water or both. The condenser shall be designed for at least 250 p.s.i.g. Provision shall be made for purging noncondensibles either manually or automatically.

(h) Receiver and liquid drain. A receiver shall be provided which is equipped with an automatic float valve to discharge the liquid ammonia to storage or with a high pressure liquid drain trap of suitable capacity. The receiver shall be designed for at least 250 p.s.i.g. operating pressure and be equipped with the necessary connections, safety relief valves and gaging device.

(i) Insulation. Refrigerated containers and pipe lines which are insulated shall be covered with a material of suitable quality and thickness for the temperatures encountered. Insulation shall be suitably supported and protected against the weather. Weatherproofing shall be of a type which will not support flame propagation.

(10) Safety equipment. All refrigerated storage plants shall have on hand the minimum safety equipment required under WAC 296-24-51009 (10)(c).

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-51013, filed 11/14/88. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-17-015 (Order 80-21), § 296-24-51013, filed 11/13/80; Order 76-6, § 296-24-51013, filed 3/1/76; Order 73-5, § 296-24-51013, filed 5/9/73 and Order 73-4, § 296-24-51013, filed 5/7/73.]

Part G-1
MEANS OF EGRESS

WAC

296-24-55001 Definitions.
296-24-56513 Exterior ways of exit access.

WAC 296-24-55001 Definitions. (1) Means of egress. A means of egress is a continuous and unobstructed way of exit travel from any point in a building or structure to a public way and consists of three separate and distinct parts: The way of exit access, the exit, and the way of exit discharge. A means of egress comprises the vertical and horizontal ways of travel and shall include intervening room spaces, doorways, hallways, corridors, passageways, balconies, ramps, stairs, enclosures, lobbies, escalators, horizontal exits, courts, and yards.

(2) Exit access. Exit access is that portion of a means of egress which leads to an entrance to an exit.

(3) Exit. Exit is that portion of a means of egress which is separated from all other spaces of the building or structure by construction or equipment as required in these standards to provide a protected way of travel to the exit of discharge.

(4) Exit discharge. Exit discharge is that portion of a means of egress between the termination of an exit and a public way.

(5) Low hazard contents. Low hazard contents shall be classified as those of such low combustibility that no self-propagating fire therein can occur and that consequently the only probable danger requiring the use of emergency exits will be from panic, fumes, or smoke, or fire from some external source.

(6) High-hazard contents. High-hazard contents shall be classified as those which are liable to burn with extreme rapidity or from which poisonous fumes or explosions are to be feared in the event of fire.

(7) Ordinary hazard contents. Ordinary hazard contents shall be classified as those which are liable to burn with moderate rapidity and to give off a considerable volume of smoke but from which neither poisonous fumes nor explosions are to be feared in case of fire.

(8) Approved. For the purposes of WAC 296-24-550 through 296-24-56701, Part G-1, WAC 296-24-585 through 296-24-58517, Part G-2, and WAC 296-24-590 through 296-24-63599, Part G-3, approved shall mean listed or approved equipment by a nationally recognized testing laboratory. Refer to WAC 296-24-58501(19) for definition of listed, and federal regulation 29 CFR 1910.7 for nationally recognized testing laboratory.

(9) Emergency action plan. A plan for a workplace, or parts thereof, describing what procedures the employer and employees must take to ensure employee safety from fire or other emergencies.

(10) Emergency escape route. The route that employees are directed to follow in the event they are required to evacuate the workplace or seek a designated refuge area.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-55001, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 82-02-003 (Order 81-32), § 296-24-55001, filed 12/24/81; Order 73-5, § 296-24-55001, filed 5/9/73 and Order 73-4, § 296-24-55001, filed 5/7/73.]

WAC 296-24-56513 Exterior ways of exit access.

(1) Access to an exit may be by means of any exterior balcony, porch, gallery, or roof that conforms to the requirements of this section.

(2) Exterior ways of exit access shall have smooth, solid floors, substantially level, and shall have guards on the unenclosed sides.

(3) Where accumulation of snow or ice is likely because of the climate, the exterior way of exit access shall be protected by a roof, unless it serves as the sole normal means of access to the rooms or spaces served, in which case it may be assumed that snow and ice will be regularly removed in the course of normal occupancy.

(4) A permanent, reasonably straight path of travel shall be maintained over the required exterior way of exit access. There shall be no obstruction by railings, barriers, or gates that divide the open space into sections appurtenant to individual rooms, apartments, or other uses. Where the director or his/her duly authorized representative finds the required path of travel to be obstructed by furniture or other movable objects, he/she may require that they be fastened out of the way or he/she may require that railings or other permanent barriers be installed to protect the path of travel against encroachment.

(5) An exterior way of exit access shall be so arranged that there are no dead ends in excess of 20 feet. Any unenclosed exit served by an exterior way of exit access shall be so located that no part of the exit extends past a vertical plane 20 feet and one-half the required width of the exit from the end of and at right angles to the way of exit access.

(6) Any gallery, balcony, bridge, porch or other exterior exit access that projects beyond the outside wall of the building shall comply with the requirements of this section as to width and arrangement.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-56513, filed 11/14/88; Order 73-5, § 296-24-56513, filed 5/9/73 and Order 73-4, § 296-24-56513, filed 5/7/73.]

Part G-2
FIRE PROTECTION

WAC

296-24-58503 Scope, application and definitions applicable.
296-24-58513 Protective clothing.

WAC 296-24-58503 Scope, application and definitions applicable. (1) Scope. This section contains requirements for fire brigades, and all portable and fixed fire suppression equipment, fire detection systems, and fire or employee alarm systems installed to meet the fire protection requirements of this chapter.

(2) Application. This section applies to all employments except for maritime, construction, and agriculture.

(3) Definitions applicable to this section.

(a) "After-flame," means the time a test specimen continues to flame after the flame source has been removed.

(b) "Aqueous film forming foam (AFFF)," means a fluorinated surfactant with a foam stabilizer which is diluted with water to act as a temporary barrier to exclude air from mixing with the fuel vapor by developing an aqueous film on the fuel surface of some hydrocarbons which is capable of suppressing the generation of fuel vapors.

(c) "Approved," means acceptable to the director under the following criteria:

(i) If it is accepted, or certified, or listed, or labeled or otherwise determined to be safe by a nationally recognized testing laboratory; or

(ii) With respect to an installation or equipment of a kind which no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, if it is inspected or tested by another federal agency and found in compliance with the provisions of the applicable National Fire Protection Association Fire Code; or

(iii) With respect to custom-made equipment or related installations which are designed, fabricated for, and intended for use by its manufacturer on the basis of test data which the employer keeps and makes available for inspection to the director; and

(iv) For the purposes of (c) of this subsection:

(A) Equipment is listed if it is of a kind mentioned in a list which is published by a nationally recognized testing laboratory which makes periodic inspections of the production of such equipment and which states that such equipment meets nationally recognized standards or has been tested and found safe for use in a specified manner;

(B) Equipment is labeled if there is attached to it a label, symbol, or other identifying mark of a nationally recognized testing laboratory which makes periodic inspections of the production of such equipment and whose labeling indicates compliance with nationally recognized standards or tests to determine safe use in a specified manner;

(C) Equipment is accepted if it has been inspected and found by a nationally recognized testing laboratory to conform to specified plans or to procedures of applicable codes;

(D) Equipment is certified if it has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards or to be safe for use in a specified manner or is of a kind whose production is periodically inspected by a nationally recognized testing laboratory, and if it bears a label, tag, or other record of certification; and

(E) Refer to federal regulation 29 CFR 1910.7 for definition of nationally recognized testing laboratory.

(d) "Automatic fire detection device," means a device designed to automatically detect the presence of fire by heat, flame, light, smoke or other products of combustion.

(e) "Buddy-breathing device," means an accessory to self-contained breathing apparatus which permits a second person to share the same air supply as that of the wearer of the apparatus.

(f) "Carbon dioxide," means a colorless, odorless, electrically nonconductive inert gas (chemical formula CO₂) that is a medium for extinguishing fires by reducing the concentration of oxygen or fuel vapor in the air to the point where combustion is impossible.

(g) "Class A fire," means a fire involving ordinary combustible materials such as paper, wood, cloth, and some rubber and plastic materials.

(h) "Class B fire," means a fire involving flammable or combustible liquids, flammable gases, greases and similar materials, and some rubber and plastic materials.

(i) "Class C fire," means a fire involving energized electrical equipment where safety to the employee requires the use of electrically nonconductive extinguishing media.

(j) "Class D fire," means a fire involving combustible metals such as magnesium, titanium, zirconium, sodium, lithium and potassium.

(k) "Dry chemical," means an extinguishing agent composed of very small particles of chemicals such as, but not limited to, sodium bicarbonate, potassium bicarbonate, urea-based potassium bicarbonate, potassium chloride, or monoammonium phosphate supplemented by special treatment to provide resistance to packing and moisture absorption (caking) as well as to provide proper flow capabilities. Dry chemical does not include dry powders.

(l) "Dry powder," means a compound used to extinguish or control Class D fires.

(m) "Education," means the process of imparting knowledge or skill through systematic instruction. It does not require formal classroom instruction.

(n) "Enclosed structure," means a structure with a roof or ceiling and at least two walls which may present fire hazards to employees, such as accumulations of smoke, toxic gases and heat similar to those found in buildings.

(o) "Extinguisher classification," means the letter classification given an extinguisher to designate the class or classes of fire on which an extinguisher will be effective.

(p) "Extinguisher rating," means the numerical rating given to an extinguisher which indicates the extinguishing potential of the unit based on standardized tests developed by Underwriters' Laboratories, Inc.

(q) "Fire brigade," (private fire department, industrial fire department) means an organized group of employees who are knowledgeable, trained, and skilled in at least basic fire fighting operations.

(r) "Fixed extinguishing system," means a permanently installed system that either extinguishes or controls a fire at the location of the system.

(s) "Flame resistance," is the property of materials, or combinations of component materials, to retard ignition and restrict the spread of flame.

(t) "Foam," means a stable aggregation of small bubbles which flow freely over a burning liquid surface and form a coherent blanket which seals combustible vapors and thereby extinguishes the fire.

(u) "Gaseous agent," is a fire extinguishing agent which is in the gaseous state at normal room temperature and pressure. It has low viscosity, can expand or contract with changes in pressure and temperature, and has the ability to diffuse readily and to distribute itself uniformly throughout an enclosure.

(v) "Halon 1211," means a colorless, faintly sweet smelling, electrically nonconductive liquefied gas (chemical formula $CBrClF_2$) which is a medium for extinguishing fires by inhibiting the chemical chain reaction of fuel and oxygen. It is also known as bromochlorodifluoromethane.

(w) "Halon 1301," means a colorless, odorless, electrically nonconductive gas (chemical formula $CBrF_3$) which is a medium for extinguishing fires by inhibiting the chemical chain reaction of fuel and oxygen. It is also known as bromotrifluoromethane.

(x) "Helmet," is a head protective device consisting of a rigid shell, energy absorption system and chin strap intended to be worn to provide protection for the head or portions thereof, against impact, flying or falling objects, electric shock, penetration, heat and flame.

(y) "Incipient stage fire," means a fire which is in the initial or beginning stage and which can be controlled or extinguished by portable fire extinguishers, Class II standpipe or small hose systems without the need for protective clothing or breathing apparatus.

(z) "Inspection," means a visual check of fire protection systems and equipment to ensure that they are in place, charged, and ready for use in the event of a fire.

(aa) "Interior structural fire fighting," means the physical activity of fire suppression, rescue or both, inside of buildings or enclosed structures which are involved in a fire situation beyond the incipient stage.

(bb) "Lining," means a material permanently attached to the inside of the outer shell of a garment for the purpose of thermal protection and padding.

(cc) "Local application system," means a fixed fire suppression system which has a supply of extinguishing agent, with nozzles arranged to automatically discharge extinguishing agent directly on the burning material to extinguish or control a fire.

(dd) "Maintenance," means the performance of services on fire protection equipment and systems to assure that they will perform as expected in the event of a fire. Maintenance differs from inspection in that maintenance requires the checking of internal fitting, devices and agent supplies.

(ee) "Multipurpose dry chemical," means a dry chemical which is approved for use on Class A, Class B and Class C fires.

(ff) "Outer shell," is the exterior layer of material on the fire coat and protective trousers which forms the outermost barrier between the fire fighter and the environment. It is attached to the vapor barrier and liner and is usually constructed with a storm flap, suitable closures, and pockets.

(gg) "Positive-pressure breathing apparatus," means self-contained breathing apparatus in which the pressure in the breathing zone is positive in relation to the immediate environment during inhalation and exhalation.

(hh) "Predischage employee alarm," means an alarm which will sound at a set time prior to actual discharge of an extinguishing system so that employees may evacuate the discharge area prior to system discharge.

(ii) "Quick disconnect valve," means a device which starts the flow of air by inserting of the hose (which leads from the facepiece) into the regulator of self-contained breathing apparatus, and stops the flow of air by disconnection of the hose from the regulator.

(jj) "Sprinkler alarm," means an approved device installed so that any waterflow from a sprinkler system equal to or greater than that from single automatic sprinkler will result in an audible alarm signal on the premises.

(kk) "Sprinkler system," means a system of piping designed in accordance with fire protection engineering standards and installed to control or extinguish fires. The system includes an adequate and reliable water supply, and a network of specially sized piping and sprinklers which are interconnected. The system also includes a control valve and a device for actuating an alarm when the system is in operation.

(ll) "Standpipe systems:"

(i) "Class I standpipe system," means a two and one-half-inch (6.3 cm) hose connection for use by fire departments and those trained in handling heavy fire streams.

(ii) "Class II standpipe system," means a one and one-half-inch (3.8 cm) hose system which provides a means for the control or extinguishment of incipient stage fires.

(iii) "Class III standpipe system," means a combined system of hose which is for the use of employees trained in the use of hose operations and which is capable of furnishing effective water discharge during the more advanced stages of fire (beyond the incipient stage) in the interior of workplaces. Hose outlets are available for both one and one-half-inch (3.8 cm) and two and one-half-inch (6.3 cm) hose.

(iv) "Small hose system," means a system of hose ranging in diameter from five-eighths-inch (1.6 cm) up to one and one-half-inch (3.8 cm) which is for the use of employees and which provides a means for the control and extinguishment of incipient stage fires.

(mm) "Total flooding system," means a fixed suppression system which is arranged to automatically discharge a predetermined concentration of agent into an enclosed space for the purpose of fire extinguishment or control.

(nn) "Training," means the process of making proficient through instruction and hands-on practice in the operation of equipment, including respiratory protection equipment, that is expected to be used in the performance of assigned duties.

(oo) "Vapor barrier," means that material used to prevent or substantially inhibit the transfer of water, corrosive liquids and steam or other hot vapors from the outside of a garment to the wearer's body.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-58503, filed 11/14/88; 87-24-051 (Order 87-24), § 296-24-58503, filed 11/30/87. Statutory Authority: RCW 49.17.040

and 49.17.050. 82-02-003 (Order 81-32), § 296-24-58503, filed 12/24/81.]

WAC 296-24-58513 Protective clothing. The following requirements apply to those employees who perform interior structural fire fighting. The requirements do not apply to employees who use fire extinguishers or standpipe systems to control or extinguish fires only in the incipient stage.

(1) General.

(a) The employer shall provide at no cost to the employee and assure the use of protective clothing which complies with the requirements of this section. The employer shall assure that protective clothing ordered or purchased after January 1, 1982, meets the requirements contained in this section. As the new equipment is provided, the employer shall assure that all fire brigade members wear the equipment when performing interior structural fire fighting. After July 1, 1985, the employer shall assure that all fire brigade members wear protective clothing meeting the requirements of this section when performing interior structural fire fighting.

(b) The employer shall assure that protective clothing protects the head, body, and extremities, and consists of at least the following components: Foot and leg protection; hand protection; body protection; eye, face and head protection.

(2) Foot and leg protection.

(a) Foot and leg protection shall meet the requirements of (b) and (c) of this subsection, and may be achieved by either of the following methods:

(i) Fully extended boots which provide protection for the legs; or

(ii) Protective shoes or boots worn in combination with protective trousers that meet the requirements of subsection (3) of this section.

(b) Protective footwear shall meet the requirements of WAC 296-24-088 for Class 75 footwear. In addition, protective footwear shall be water-resistant for at least five inches (12.7 cm) above the bottom of the heel and shall be equipped with slip-resistant outer soles.

(c) Protective footwear shall be tested in accordance with paragraph (1) Appendix E, and shall provide protection against penetration of the midsole by a size 8D common nail when at least 300 pounds (1330 N) of static force is applied to the nail.

(3) Body protection.

(a) Body protection shall be coordinated with foot and leg protection to ensure full body protection for the wearer. This shall be achieved by one of the following methods:

(i) Wearing of a fire-resistant coat meeting the requirements of (b) of this subsection, in combination with fully extended boots meeting the requirements of subsection (2)(b) and (c) of this section; or

(ii) Wearing of fire-resistant coat in combination with protective trousers both of which meet the requirements of (b) of this subsection.

(b) The performance, construction, and testing of fire-resistant coats and protective trousers shall be at least equivalent to the requirements of the National Fire

Protection Association (NFPA) standard NFPA No. 1971-1975, "Protective Clothing for Structural Fire Fighting," (see Appendix D) with the following permissible variations from those requirements:

(i) Tearing strength of the outer shell shall be a minimum of eight pounds (35.6 N) in any direction when tested in accordance with paragraph (2) of Appendix E; and

(ii) The outer shell may discolor but shall not separate or melt when placed in a forced air laboratory oven at a temperature of 500°F (260°C) for a period of five minutes. After cooling to ambient temperature and using the test method specified in paragraph (3) of Appendix E, char length shall not exceed 4.0 inches (10.2 cm) and after-flame shall not exceed 2.0 seconds.

(4) Hand protection.

(a) Hand protection shall consist of protective gloves or glove system which will provide protection against cut, puncture, and heat penetration. Gloves or glove system shall be tested in accordance with the test methods contained in the National Institute for Occupational Safety and Health (NIOSH) 1976 publication, "The Development of Criteria for Fire Fighter's Gloves; Vol. II, Part II: Test Methods," (see Appendix D to Subpart L) and shall meet the following criteria for cut, puncture, and heat penetration:

(i) Materials used for gloves shall resist surface cut by a blade with an edge having a 60 degree included angle and a .001 inch (.0025 cm.) radius, under an applied force of 16 lbf (72N) and at a slicing velocity of greater or equal to 60 in/min. (2.5 cm/sec);

(ii) Materials used for the palm and palm side of the fingers shall resist puncture by a penetrometer (simulating a 4d lath nail), under an applied force of 13.2 lbf (60N) and at a velocity greater or equal to 20 in/min. (.85 cm/sec); and

(iii) The temperature inside the palm and gripping surface of the fingers of gloves shall not exceed 135°F (57°C) when gloves or glove system are exposed to 932°F (500°C) for five seconds at 4 psi (28 kPa) pressure.

(b) Exterior materials of gloves shall be flame resistant and shall be tested in accordance with paragraph (3) of Appendix E. Maximum allowable after-flame shall be 2.0 seconds, and the maximum char length shall be 4.0 inches (10.2 cm).

(c) When design of the fire-resistant coat does not otherwise provide protection for the wrists, protective gloves shall have wristlets of at least 4.0 inches (10.2 cm) in length to protect the wrist area when the arms are extended upward and outward from the body.

(5) Head, eye and face protection.

(a) Head protection shall consist of a protective head device with ear flaps and chin strap which meet the performance, construction, and testing requirements of the National Fire Safety and Research Office of the National Fire Prevention and Control Administration, United States Department of Commerce (now known as the United States Fire Administration), which are contained in, "Model Performance Criteria for Structural

Firefighters' Helmets," (August 1977) (see Appendix D).

(b) Protective eye and face devices which comply with WAC 296-24-078 shall be used by fire brigade members when performing operations where the hazards of flying or falling materials which may cause eye and face injuries are present. Protective eye and face devices provided as accessories to protective head devices (face shields) are permitted when such devices meet the requirements of WAC 296-24-078.

(c) Full facepieces, helmets, or hoods of breathing apparatus which meet the requirements of WAC 296-62-071 and 296-24-58515, shall be acceptable as meeting the eye and face protection requirements of (b) of this subsection.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-24-58513, filed 7/6/88; 87-24-051 (Order 87-24), § 296-24-58513, filed 11/30/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 82-02-003 (Order 81-32), § 296-24-58513, filed 12/24/81.]

Part G-3

FIRE SUPPRESSION EQUIPMENT

WAC

- 296-24-590 Repealed.
- 296-24-59001 Repealed.
- 296-24-59003 Repealed.
- 296-24-59005 Repealed.
- 296-24-59007 Repealed.
- 296-24-59211 Hydrostatic testing.
- 296-24-600 Repealed.
- 296-24-60001 Repealed.
- 296-24-60003 Repealed.
- 296-24-60005 Repealed.
- 296-24-60007 Repealed.
- 296-24-605 Repealed.
- 296-24-60501 Repealed.
- 296-24-60503 Repealed.
- 296-24-60505 Repealed.
- 296-24-60507 Repealed.
- 296-24-60509 Repealed.
- 296-24-615 Repealed.
- 296-24-61501 Repealed.
- 296-24-61503 Repealed.
- 296-24-61505 Repealed.
- 296-24-620 Repealed.
- 296-24-62001 Repealed.
- 296-24-62003 Repealed.
- 296-24-625 Repealed.
- 296-24-63399 Appendix C—Fire protection references for further information.
- 296-24-63599 Appendix E—Test methods for protective clothing.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS SUBCHAPTER

- 296-24-590 Portable fire suppression equipment—Portable fire extinguishers. [Order 73-5, § 296-24-590, filed 5/9/73 and Order 73-4, § 296-24-590, filed 5/7/73.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
- 296-24-59001 General requirements. [Order 73-5, § 296-24-59001, filed 5/9/73 and Order 73-4, § 296-24-59001, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-59003 Selection of extinguishers. [Order 74-27, § 296-24-59003, filed 5/7/74; Order 73-5, § 296-24-59003, filed 5/9/73 and Order 73-4, § 296-24-59003, filed

- 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-59005 Distribution of portable fire extinguishers. [Order 73-5, § 296-24-59005, filed 5/9/73 and Order 73-4, § 296-24-59005, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-59007 Inspection, maintenance, and hydrostatic tests. [Order 74-27, § 296-24-59007, filed 5/7/74; Order 73-5, § 296-24-59007, filed 5/9/73 and Order 73-4, § 296-24-59007, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-600 Standpipe and hose systems. [Order 73-5, § 296-24-600, filed 5/9/73 and Order 73-4, § 296-24-600, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-60001 General requirements. [Order 73-5, § 296-24-60001, filed 5/9/73 and Order 73-4, § 296-24-60001, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-60003 Hose outlets. [Order 74-27, § 296-24-60003, filed 5/7/74; Order 73-5, § 296-24-60003, filed 5/9/73 and Order 73-4, § 296-24-60003, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-60005 Water supplies. [Order 73-5, § 296-24-60005, filed 5/9/73 and Order 73-4, § 296-24-60005, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-60007 Tests and maintenance. [Order 73-5, § 296-24-60007, filed 5/9/73 and Order 73-4, § 296-24-60007, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-605 Fixed fire suppression equipment—Automatic sprinkler systems. [Order 73-5, § 296-24-605, filed 5/9/73 and Order 73-4, § 296-24-605, filed 5/7/73.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
- 296-24-60501 General requirements. [Order 73-5, § 296-24-60501, filed 5/9/73 and Order 73-4, § 296-24-60501, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-60503 Fire department connections. [Order 73-5, § 296-24-60503, filed 5/9/73 and Order 73-4, § 296-24-60503, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-60505 Sprinkler alarms. [Order 73-5, § 296-24-60505, filed 5/9/73 and Order 73-4, § 296-24-60505, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-60507 Maintenance of sprinkler system. [Order 76-6, § 296-24-60507, filed 3/1/76; Order 73-5, § 296-24-60507, filed 5/9/73 and Order 73-4, § 296-24-60507, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-60509 Sprinkler head clearance. [Order 73-5, § 296-24-60509, filed 5/9/73 and Order 73-4, § 296-24-60509, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-615 Fixed dry chemical extinguishing systems. [Order 73-5, § 296-24-615, filed 5/9/73 and Order 73-4, § 296-24-615, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.

- 296-24-61501 General requirements. [Order 73-5, § 296-24-61501, filed 5/9/73 and Order 73-4, § 296-24-61501, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-61503 Alarms and indicators. [Order 74-27, § 296-24-61503, filed 5/7/74; Order 73-5, § 296-24-61503, filed 5/9/73 and Order 73-4, § 296-24-61503, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-61505 Inspection and maintenance. [Order 76-6, § 296-24-61505, filed 3/1/76; Order 73-5, § 296-24-61505, filed 5/9/73 and Order 73-4, § 296-24-61505, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-620 Carbon dioxide extinguishing systems. [Order 73-5, § 296-24-620, filed 5/9/73 and Order 73-4, § 296-24-620, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-62001 General requirements. [Order 73-5, § 296-24-62001, filed 5/9/73 and Order 73-4, § 296-24-62001, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-62003 Inspection and maintenance. [Order 74-27, § 296-24-62003, filed 5/7/74; Order 73-5, § 296-24-62003, filed 5/9/73 and Order 73-4, § 296-24-62003, filed 5/7/73.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-24-625 Local fire alarm signaling systems. [Order 74-27, § 296-24-625, filed 5/7/74.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.

WAC 296-24-590 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-59001 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-59003 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-59005 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-59007 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-59211 Hydrostatic testing. (1) The employer shall assure that hydrostatic testing is performed by trained persons with suitable testing equipment and facilities.

(2) The employer shall assure that portable extinguishers are hydrostatically tested at the intervals listed in Table I of this section, except under any of the following conditions:

- (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;

TABLE I

Type of Extinguishers	Test Interval (Years)
Soda acid (soldered brass shells) (until January 1, 1982)	(1)
Soda acid (stainless steel shell)	5
Cartridge operated water and/or antifreeze	5
Stored pressure water and/or antifreeze	5
Wetting agent	5
Foam (soldered brass shells) (until January 1, 1982)	(1)
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

(1) Extinguishers having shells constructed of copper or brass joined by soft solder or rivets shall not be hydrostatically tested and shall be removed from service by January 1, 1982. (Not permitted.)

(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, the employer shall assure that an internal examination of cylinders and shells to be tested is made prior to the hydrostatic tests.

(4) The employer shall assure that portable fire extinguishers are hydrostatically tested whenever they show new evidence of corrosion or mechanical injury, except under the conditions listed in subsection (2)(a) through (e) of this section.

(5) The employer shall assure that hydrostatic tests are performed on extinguisher hose assemblies which are equipped with a shut-off nozzle at the discharge end of the hose. The test interval shall be the same as specified for the extinguisher on which the hose is installed.

(6) The employer shall assure that carbon dioxide hose assemblies with a shut-off nozzle are hydrostatically tested at 1,250 psi (8,620 kPa).

(7) The employer shall assure that dry chemical and dry powder hose assemblies with a shut-off nozzle are 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) The employer shall assure that hose assemblies for carbon dioxide extinguishers that require a hydrostatic test are tested within a protective cage device.

(10) The employer shall assure 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 which comply with DOT 173.39(e)(15) may be hydrostatically tested every ten years.

(11) The employer shall assure 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) The employer shall assure that acceptable self-generating type soda acid and foam extinguishers are tested at 350 psi (2,410 kPa).

(13) Air or gas pressure may not be used for hydrostatic testing.

(14) Extinguisher shells, cylinders, or cartridges which fail a hydrostatic pressure test, or which are not fit for testing shall be removed from service and from the workplace.

(15)(a) The equipment for testing compressed gas type cylinders shall be of the water-jacket type. The equipment shall be provided with an expansion indicator which operates with an accuracy within one percent of the total expansion or 0.1 cc (.1 mL) of liquid.

(b) The equipment for testing noncompressed gas type cylinders shall consist of the following:

(i) A hydrostatic test pump, hand or power operated, capable of producing not less than one hundred fifty percent of the test pressure, which shall 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) The employer shall maintain and provide upon request to the director evidence that the required hydrostatic testing of fire extinguishers has been performed at the time intervals shown in Table I. Such evidence shall include the date of test, the test pressure used, and the person or agency performing the test. Such records shall be kept until the extinguisher is hydrostatically retested at the time interval specified in Table I, or until the extinguisher is taken out of service, whichever is less.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-24-59211, filed 11/30/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 82-02-003 (Order 81-32), § 296-24-59211, filed 12/24/81.]

WAC 296-24-600 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-60001 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-60003 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-60005 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-60007 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-605 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-60501 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-60503 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-60505 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-60507 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-60509 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-615 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-61501 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-61503 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-61505 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-620 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-62001 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-62003 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-625 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-24-63399 Appendix C—Fire protection references for further information. (1) Appendix general references. The following references provide information which can be helpful in understanding the requirements contained in all of the sections of Part G:

(a) Fire Protection Handbook, National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(b) Accident Prevention Manual for Industrial Operations, National Safety Council, 425 North Michigan Avenue, Chicago, IL 60611.

(c) Various associations also publish information which may be useful in understanding these standards. Examples of these associations are: Fire Equipment Manufacturers Association (FEMA) of Arlington, VA 22204, and the National Association of Fire Equipment Distributors (NAFED) of Chicago, IL 60601.

(2) Appendix references applicable to individual sections. The following references are grouped according to individual sections contained in Part G. These references

provide information which may be helpful in understanding and implementing the standards of each section of Part G.

(a) WAC 296-24-58505 - Fire brigades:

(i) Private Fire Brigades, NFPA 27; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(ii) Initial Fire Attack, Training Standard On, NFPA 197; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(iii) Fire Fighter Professional Qualifications, NFPA 1001; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(iv) Organization for Fire Services, NFPA 1201; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(v) Organization of a Fire Department, NFPA 1202; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(vi) Protective Clothing for Structural Fire Fighting, ANSI/NFPA 1971; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(vii) American National Standard for Men's Safety-Toe Footwear, ANSI Z41.1; American National Standards Institute, New York, NY 10018.

(viii) American National Standard for Occupational and Educational Eye and Face Protection, ANSI Z87.1; American National Standards Institute, New York, NY 10018.

(ix) American National Standard, Safety Requirements for Industrial Head Protection, ANSI Z89.1; American National Standards Institute, New York, NY 10018.

(x) Specifications for Protective Headgear for Vehicular Users, ANSI Z90.1; American National Standards Institute, New York, NY 10018.

(xi) Testing Physical Fitness; Davis and Santa Maria, Fire Command, April 1975.

(xii) Development of a Job-Related Physical Performance Examination for Fire Fighters; Dotson and Others. A summary report for the National Fire Prevention and Control Administration, Washington, D.C., March 1977.

(xiii) Proposed Sample Standards for Fire Fighters' Protective Clothing and Equipment; International Association of Fire Fighters, Washington, D.C.

(xiv) A Study of Facepiece Leakage of Self-Contained Breathing Apparatus by DOP Man Tests; Los Alamos Scientific Laboratory, Los Alamos, N.M.

(xv) The Development of Criteria for Fire Fighters' Gloves; Vol. II: Glove Criteria and Test Methods; National Institute for Occupational Safety and Health, Cincinnati, Ohio, 1976.

(xvi) Model Performance Criteria for Structural Fire Fighters' Helmets; National Fire Prevention and Control Administration, Washington, D.C., 1977.

(xvii) Firefighters; Job Safety and Health Magazine, Occupational Safety and Health Administration, Washington, D.C., June 1978.

(xviii) Eating Smoke—The Dispensable Diet; Utech, H.P. The Fire Independent, 1975.

(xix) Project Monoxide—A Medical Study of an Occupational Hazard of Fire Fighters; International Association of Fire Fighters, Washington, D.C.

(xx) Occupational Exposures to Carbon Monoxide in Baltimore Firefighters; Radford Baltimore, MD. Journal of Occupational Medicine, September, 1976.

(xxi) Fire Brigades; National Safety Council, Chicago, IL, 1966.

(xxii) American National Standard, Practice for Respiratory Protection for the Fire Service, ANSI Z88.5; American National Standards Institute, New York, NY 10018.

(xxiii) Respirator Studies for the Nuclear Regulatory Commission; October 1, 1977—September 30, 1978. Evaluation and Performance of Open-Circuit Breathing Apparatus. NUREG/CR-1235. Los Alamos Scientific Laboratory; Los Alamos, NM 87545, January, 1980.

(b) WAC 296-24-592 - Portable fire extinguishers:

(i) Standard for Portable Fire Extinguishers, ANSI/NFPA 10; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(ii) Methods for Hydrostatic Testing of Compressed-Gas Cylinders, C-1; Compressed Gas Association, 500 Fifth Avenue, New York, NY 10036.

(iii) Recommendations for the Disposition of Unserviceable Compressed-Gas Cylinders, C-2; Compressed Gas Association, 500 Fifth Avenue, New York, NY 10036.

(iv) Standard for Visual Inspection of Compressed-Gas Cylinders, C-6; Compressed Gas Association, 500 Fifth Avenue, New York, NY 10036.

(v) Portable Fire Extinguisher Selection Guide, National Association of Fire Equipment Distributors; 111 East Wacker Drive, Chicago, IL 60601.

(c) WAC 296-24-602 - Standpipe and hose systems:

(i) Standard for the Installation of Sprinkler Systems, ANSI/NFPA 13; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(ii) Standard of the Installation of Standpipe and Hose Systems, ANSI/NFPA 14; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(iii) Standard for the Installation of Centrifugal Fire Pumps, ANSI/NFPA 20; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(iv) Standard for Water Tanks for Private Fire Protection, ANSI/NFPA 22; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(v) Standard for Screw Threads and Gaskets for Fire Hose Connections, ANSI/NFPA 194; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(vi) Standard for Fire Hose, NFPA 196; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(vii) Standard for the Care of Fire Hose, NFPA 198; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(d) WAC 296-24-607 - Automatic sprinkler systems:

- (i) Standard of the Installation of Sprinkler Systems, ANSI/NFPA 13; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (ii) Standard for the Care and Maintenance of Sprinkler Systems, ANSI/NFPA 13A; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (iii) Standard for the Installation of Standpipe and Hose Systems, ANSI/NFPA 14; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (iv) Standard for the Installation of Centrifugal Fire Pumps, ANSI/NFPA 20; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (v) Standard for Water Tanks for Private Fire Protection, ANSI/NFPA 22; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (vi) Standard for Indoor General Storage, ANSI/NFPA 231; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (vii) Standard for Rack Storage of Materials, ANSI/NFPA 231C; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (e) WAC 296-24-617 - Fixed extinguishing systems, general information:
- (i) Standard for Foam Extinguishing Systems, ANSI/NFPA 11; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (ii) Standard for Hi-Expansion Foam Systems, ANSI/NFPA 11A; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (iii) Standard on Synthetic Foam and Combined Agent Systems, ANSI/NFPA 11B; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (iv) Standard on Carbon Dioxide Extinguishing Systems, ANSI/NFPA 12; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (v) Standard on Halon 1301, ANSI/NFPA 12A; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (vi) Standard on Halon 1211, ANSI/NFPA 12B; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (vii) Standard for Water Spray Systems, ANSI/NFPA 15; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (viii) Standard for Foam-Water Sprinkler Systems and Foam-Water Spray Systems, ANSI/NFPA 16; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (ix) Standard for Dry Chemical Extinguishing Systems, ANSI/NFPA 17; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (f) WAC 296-24-622 - Fixed extinguishing systems, dry chemical:
- (i) Standard for Dry Chemical Extinguishing Systems, ANSI/NFPA 17; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (ii) National Electrical Code, ANSI/NFPA 70; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (iii) Standard for the Installation of Equipment for the Removal of Smoke and Grease-Laden Vapor from Commercial Cooling Equipment, NFPA 96; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (g) WAC 296-24-623 - Fixed extinguishing systems, gaseous agents:
- (i) Standard on Carbon Dioxide Extinguishing Systems, ANSI/NFPA 12; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (ii) Standard on Halon 1301, ANSI/NFPA 12B; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (iii) Standard on Halon 1211, ANSI/NFPA 12; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (iv) Standard on Explosion Prevention Systems, ANSI/NFPA 69; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (v) National Electrical Code, ANSI/NFPA 70; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (vi) Standard on Automatic Fire Detectors, ANSI/NFPA 72E; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (vii) Determination of Halon 1301/1211 Threshold Extinguishing Concentrations Using the Cup Burner Method, Riley and Olson, Ansl Report AL-530-A.
- (h) WAC 296-24-627 - Fixed extinguishing systems, water spray and foam agents:
- (i) Standard for Foam Extinguisher Systems, ANSI/NFPA 11; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (ii) Standard for High-Expansion Foam Systems, ANSI/NFPA 11A; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (iii) Standard for Water Spray Fixed Systems for Fire Protection, ANSI/NFPA 15; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (iv) Standard for the Installation of Foam-Water Sprinkler Systems and Foam-Water Spray Systems, ANSI/NFPA 16; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (i) WAC 296-24-629 - Fire detection systems:
- (i) National Electrical Code, ANSI/NFPA 70; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (ii) Standard for Central Station Signaling Systems, ANSI/NFPA 71; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (iii) Standard on Automatic Fire Detectors, ANSI/NFPA 72E; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.
- (j) WAC 296-24-631 - Employee alarm systems:
- (i) National Electrical Code, ANSI/NFPA 70; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(ii) Standard for Central Station Signaling Systems, ANSI/NFPA 71; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(iii) Standard for Local Protective Signaling Systems, ANSI/NFPA 72A; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(iv) Standard for Auxiliary Protective Signaling Systems, ANSI/NFPA 72B; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(v) Standard for Remote Station Protective Signaling Systems, ANSI/NFPA 72C; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(vi) Standard for Proprietary Protective Signaling Systems, ANSI/NFPA 72D; National Fire Protection Association, 470 Atlantic Avenue, Boston, MA 02210.

(vii) Vocal Emergency Alarms in Hospitals and Nursing Facilities: Practice and Potential, National Bureau of Standards, Washington, D.C., July, 1977.

(viii) Fire Alarm and Communication Systems, National Bureau of Standards, Washington, D.C., April, 1976.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-24-63399, filed 7/6/88; 87-24-051 (Order 87-24), § 296-24-63399, filed 11/30/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 82-02-003 (Order 81-32), § 296-24-63399, filed 12/24/81.]

WAC 296-24-63599 Appendix E--Test methods for protective clothing. This appendix contains test methods which must be used to determine if protective clothing affords the required level of protection as specified in WAC 296-24-58505 - fire brigades.

(1) Puncture resistance test method for foot protection.

(a) Apparatus. The puncture resistance test shall be performed on a testing machine having a movable platform adjusted to travel at one-quarter-inch per minute (0.1 cm/sec). Two blocks of hardwood, metal, or plastic shall be prepared as follows: The blocks shall be of such size and thickness as to insure a suitable rigid test ensemble and allow for at least one-inch of the pointed end of an 8D nail to be exposed for the penetration. One block shall have a hole drilled to hold an 8D common nail firmly at an angle of 98°. The second block shall have a maximum one-half inch (1.3 cm) diameter hole drilled through it so that the hole will allow free passage of the nail after it penetrates the insole during the test.

(b) Procedure. The test ensemble consisting of the sample unit, the two prepared blocks, a piece of leather outsole ten to eleven irons thick and a new 8D nail, shall be placed as follows: The 8D nail in the hole, the sample of outsole stock superimposed above the nail, the area of the sole plate to be tested placed on the outsole, and the second block with hole so placed as to allow for free passage of the nail after it passes through the outsole stock and sole plate in that order. The machine shall be started and the pressure, in pounds required for the nail to completely penetrate the outsole and sole plate, recorded to the nearest five pounds. Two determinations shall be made on each sole plate and the results averaged. A new nail shall be used for each determination.

(c) Source. These test requirements are contained in "Military Specification For Fireman's Boots," MIL-B-2885D (1973 and amendment dated 1975) and are reproduced for your convenience.

(2) Test method for determining the strength of cloth by tearing: Trapezoid method.

(a) Test specimen. The specimen shall be a rectangle of cloth three-inches by six-inches (7.6 cm by 15.2 cm). The long dimension shall be parallel to the warp for warp tests and parallel to the filling for filling tests. No two specimens for warp tests shall contain the same warp yarns, nor shall any two specimens for filling tests contain the same filling yarns. The specimen shall be taken no nearer the selvage than 1/10 the width of the cloth. An isosceles trapezoid having an altitude of three inches (7.6 cm) and bases of one inch (2.5 cm) and four inches (10.2 cm) in length, respectively, shall be marked on each specimen, preferably with the aid of a template. A cut approximately three-eighths inch (1 cm) in length shall then be made in the center of a perpendicular to the one inch (2.5 cm) edge.

(b) Apparatus.

(i) Six-ounce (.17 kg) weight tension clamps shall be used so designed that the six ounces (.17 kg) of weight are distributed evenly across the complete width of the sample.

(ii) The machine shall consist of three main parts: Straining mechanism, clamps for holding specimen, and load and elongation recording mechanisms.

(iii) A machine wherein the specimen is held between two clamps and strained by a uniform movement of the pulling clamp shall be used.

(iv) The machine shall be adjusted so that the pulling clamp shall have a uniform speed of 12 ± 10.5 inches per minute ($0.5 \pm .02$ cm/sec).

(v) The machine shall have two clamps with two jaws on each clamp. The design of the two clamps shall be such that one gripping surface or jaw may be an integral part of the rigid frame of the clamp or be fastened to allow a slight vertical movement, while the other gripping surface or jaw shall be completely moveable. The dimension of the immovable jaw of each clamp parallel to the application of the load shall measure one inch, and the dimension of the jaw perpendicular to this direction shall measure three inches or more. The face of the moveable jaw of each clamp shall measure one inch by three inches.

Each jaw face shall have a flat, smooth, gripping surface. All edges which might cause a cutting action shall be rounded to a radius of not over 1/64 inch (.04 cm). In cases where a cloth tends to slip when being tested, the jaws may be faced with rubber or other material to prevent slippage. The distance between the jaws (gape length) shall be one inch at the start of the test.

(vi) Calibrated dial; scale or chart shall be used to indicate applied load and elongation. The machine shall be adjusted or set, so that the maximum load required to break the specimen will remain indicated on the calibrated dial or scale after the test specimen has ruptured.

(vii) The machine shall be of such capacity that the maximum load required to break the specimen shall be

not greater than eighty-five percent or less than fifteen percent of the rated capacity.

(viii) The error of the machine shall not exceed two percent up to and including a fifty-pound load (22.6 kg) and one percent over a fifty-pound load (22.6 kg) at any reading within its loading range.

(ix) All machine attachments for determining maximum loads shall be disengaged during this test.

(c) Procedure.

(i) The specimen shall be clamped in the machine along the nonparallel sides of the trapezoid so that these sides lie along the lower edge of the upper clamp and the upper edge of the lower clamp with the cut halfway between the clamps. The short trapezoid base shall be held taut and the long trapezoid base shall lie in the folds.

(ii) The machine shall be started and the force necessary to tear the cloth shall be observed by means of an autographic recording device. The speed of the pulling clamp shall be 12 inches \pm 0.5-inch per minute (0.5 \pm .02 cm/sec).

(iii) If a specimen slips between the jaws, breaks in or at the edges of the jaws, or if for any reason attributable to faulty technique, an individual measurement falls markedly below the average test results for the sample unit, such result shall be discarded and another specimen shall be tested.

(iv) The tearing strength of the specimen shall be the average of the five highest peak loads of resistance registered for three inches (7.6 cm) of separation of the tear.

(d) Report.

(i) Five specimens in each of the warp and filling direction shall be tested from each sample unit.

(ii) The tearing strength of the sample unit shall be the average of the result obtained from the specimens tested in each of the warp and filling directions and shall be reported separately to the nearest 0.1 pound (.05 kg).

(e) Source. These test requirements are contained in "Federal Test Method Standard 191, Method 5136," and are reproduced for your convenience.

(3) Test method for determining flame resistance of cloth; vertical.

(a) Test specimen. The specimen shall be a rectangle of cloth two and three-quarter inches (7.0 cm) by twelve inches (30.5 cm) with the long dimension parallel to either the warp or filling direction of the cloth. No two warp specimens shall contain the same warp yarns, and no two filling specimens shall contain the same filling yarn.

(b) Number of determinations. Five specimens from each of the warp and filling directions shall be tested from each sample unit.

(c) Apparatus.

(i) Cabinet. A cabinet and accessories shall be fabricated in accordance with the requirements specified in Figures L-1, L-2, and L-3. Galvanized sheet metal or other suitable metal shall be used. The entire inside back wall of the cabinet shall be painted black to facilitate the viewing of the test specimen and pilot flame.

(ii) Burner. The burner shall be equipped with a variable orifice to adjust the flame height, a barrel having a

three-eighth inch (9.5 mm) inside diameter and a pilot light.

(A) The burner may be constructed by combining a three-eighth inch (1 cm) inside diameter barrel $3 \pm 1/4$ -inches (7.6 \pm .6 cm) long from a fixed orifice burner with a base from a variable orifice burner.

(B) The pilot light tube shall have a diameter of approximately one-sixteenth inch (.2 cm) and shall be spaced one-eighth inch (.3 cm) away from the burner edge with a pilot flame one-eighth inch (.3 cm) long.

(C) The necessary gas connections and the applicable plumbing shall be as specified in Figure L-4 except that a solenoid valve may be used in lieu of the stopcock valve to which the burner is attached. The stopcock valve or solenoid valve, whichever is used, shall be capable of being fully opened or fully closed in 0.1 second.

(D) On the side of the barrel of the burner, opposite the pilot light there shall be a metal rod of approximately one-eighth inch (.3 cm) diameter spaced one-half inch (1.3 cm) from the barrel and extending above the burner. The rod shall have two five-sixteenth inch (.8 cm) prongs marking the distances of three-quarters inch (1.9 cm), and one and one-half inches (3.8 cm) above the top of the burner.

(E) The burner shall be fixed in a position so that the center of the barrel of the burner is directly below the center of the specimen.

(iii) There shall be a control valve system with a delivery rate designed to furnish gas to the burner under a pressure of $2-1/2 \pm 1/4$ (psi) (17.5 \pm 1.8 kPa) per square inch at the burner inlet. The manufacturer's recommended delivery rate for the valve system shall be included in the required pressure.

(iv) A synthetic gas mixture shall be of the following composition within the following limits (analyzed at standard conditions): 55 \pm 3 percent hydrogen, 24 \pm 1 percent methane, 3 \pm 1 percent ethane, and 18 \pm 1 percent carbon monoxide which will give a specific gravity of 0.365 ± 0.018 (air = 1) and a B.T.U. content of 540 ± 20 per cubic foot (20.1 \pm 3.7 kJL) (dry basis) at 69.8 F (21 C).

(v) There shall be metal hooks and weights to produce a series of total loads to determine length of char. The metal hooks shall consist of No. 19 gage steel wire or equivalent and shall be made from three inch (7.6 cm) lengths of wire and bent one-half inch (1.3 cm) from one end to a 45-degree hook. One end of the hook shall be fastened around the neck of the weight to be used.

(vi) There shall be a stop watch or other device to measure the burning time 0.2 second.

(vii) There shall be a scale, graduated in 0.1 inch (.3 cm) to measure the length of char.

(d) Procedure.

(i) The material undergoing test shall be evaluated for the characteristics of after-flame time and char length on each specimen.

(ii) All specimens to be tested shall be at moisture equilibrium under standard atmospheric conditions in accordance with subsection (3)(c) of this appendix. Each specimen to be tested shall be exposed to the test flame within twenty seconds after removal from the standard

atmosphere. In case of dispute, all testing will be conducted under standard atmospheric conditions in accordance with subsection (3)(c) of this appendix.

(iii) The specimen in its holder shall be suspended vertically in the cabinet in such a manner that the entire length of the specimen is exposed and the lower end is three-quarters inch (1.9 cm) above the top of the gas burner. The apparatus shall be set up in a draft-free area.

(iv) Prior to inserting the specimen, the pilot flame shall be adjusted to approximately one-eighth inch (.3 cm) in height measured from its lowest point to the tip.

The burner flame shall be adjusted by means of the needle valve in the base of the burner to give a flame height of one and one-half inches (3.8 cm) with the stopcock fully open and the air supply to burner shut off and taped. The one and one-half inch (3.8 cm) flame height is obtained by adjusting the valve so that the uppermost portion (tip) of the flame is level with the tip of the metal prong (see Fig. L-2) specified for adjustment of flame height. It is an important aspect of the evaluation that the flame height to be adjusted with the tip of the flame level with the tip of the metal prong. After inserting the specimen, the stopcock shall be fully opened, and the burner flame applied vertically at the middle of the lower edge of the specimen for twelve seconds and the burner turned off. The cabinet door shall remain shut during testing.

(v) The after-flame shall be the time the specimen continues to flame after the burner flame is shut off.

(vi) After each specimen is removed, the test cabinet shall be cleared of fumes and smoke prior to testing the next specimen.

(vii) After both flaming and glowing have ceased, the char length shall be measured. The char length shall be the distance from the end of the specimen, which was exposed to the flame, to the end of a tear (made lengthwise) of the specimen through the center of the charred area as follows: The specimen shall be folded lengthwise and creased by hand along a line through the highest peak of the charred area. The hook shall be inserted in the specimen (or a hole, one-quarter inch (.6 cm) diameter or less, punched out for the hook) at one side of the charred area one-quarter inch (.6 cm) from the adjacent outside edge and one-quarter inch (.6 cm) in from the lower end. A weight of sufficient size such that the weight and hook together shall equal the total tearing load required in Table L-2 of this section shall be attached to the hook.

(viii) A tearing force shall be applied gently to the specimen by grasping the corner of the cloth at the opposite edge of the char from the load and raising the specimen and weight clear of the supporting surface. The end of the tear shall be marked off on the edge and the char length measurement made along the undamaged edge.

Loads for determining char length applicable to the weight of the test cloth shall be as shown in Table L-2.

TABLE L-2

Specified weight per square yard of cloth before any fire retardant treatment or coating -- ounces	Total learning weight for determining the charred length -- pound
2.0 to 6.0	0.25
Over 6.0 to 15.0	0.50
Over 15.0 to 23.0	0.75
Over 23.0	1.0

To change into S.I. (System International) units, 1 ounce = 28.35 grams, 1 pound = 453 grams, 1 yard = .91 metre.

(ix) The after-flame time of the specimen shall be recorded to the nearest 0.2 second and the char length to the nearest 0.1 inch (.3 cm).

(e) Report.

(i) The after-flame time and char length of the sample unit shall be the average of the results obtained from the individual specimens tested. All values obtained from the individual specimens shall be recorded.

(ii) The after-flame time shall be reported in the nearest 0.2 second and the char length to the nearest 0.1 inch (.3 cm).

(f) Source. These test requirements are contained in "Federal Test Method Standard 191, Method 5903 (1971)," and are reproduced for your convenience.

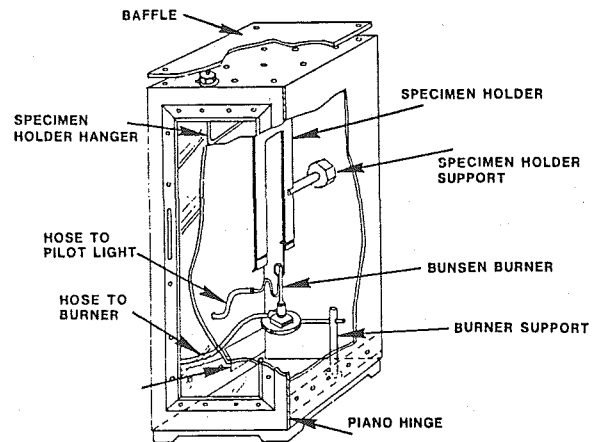


Figure L-1 - Vertical flame resistance textile apparatus. All given dimensions are in inches. System International (S.I.) unit: 1 inch = 2.54 cm.

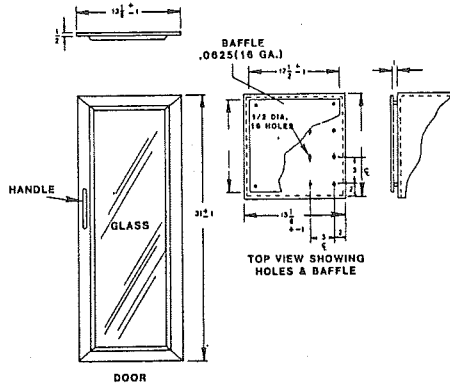


Figure L-2 – Vertical flame resistance textile apparatus, door and top view w/baffle. All given dimensions are in inches. System International (S.I.) unit: 1 inch = 2.54 cm.

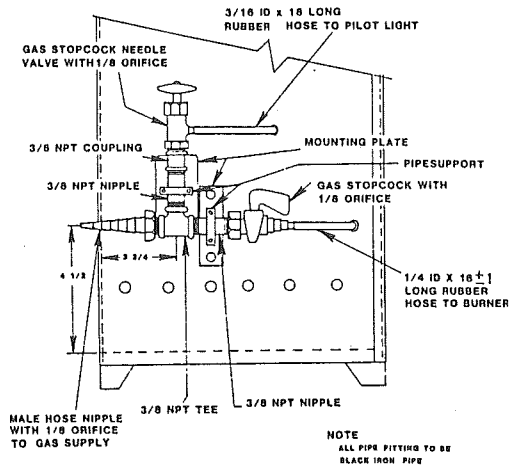


Figure L-4 – Vertical flame resistance textile apparatus. All given dimensions are in inches. System International (S.I.) unit: 1 inch = 2.54 cm.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-24-63599, filed 11/30/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 82-02-003 (Order 81-32), § 296-24-63599, filed 12/24/81.]

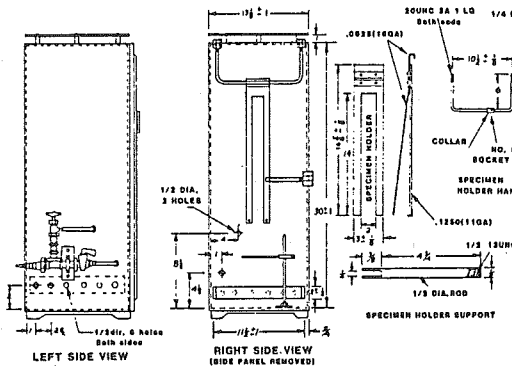


Figure L-3 – Vertical flame resistance textile apparatus, views and details. All given dimensions are in inches. System International (S.I.) unit: 1 inch = 2.54 cm.

Part I

WELDING, CUTTING AND BRAZING

WAC

- 296-24-68001 Definitions.
- 296-24-68203 Cylinders and containers.

WAC 296-24-68001 Definitions. (1) "Welder" and "welding operator" mean any operator of electric or gas welding and cutting equipment.

(2) "Approved" means listed or approved by a nationally recognized testing laboratory. Refer to WAC 296-24-58501(19) for definitions of listed and approved, and federal regulation 29 CFR 1910.7 for nationally recognized testing laboratory.

(3) All other welding terms are used in accordance with American Welding Society—Terms and Definitions—A3.0-1969.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-68001, filed 11/14/88; Order 73-5, § 296-24-68001, filed 5/9/73 and Order 73-4, § 296-24-68001, filed 5/7/73.]

WAC 296-24-68203 Cylinders and containers. (1) Approval and marking. All portable cylinders used for the storage and shipment of compressed gases shall be constructed and maintained in accordance with the regulations of the United States Department of Transportation, 49 CFR Parts 171-179.

(a) Compressed gas cylinders shall be legibly marked, for the purpose of identifying the gas content, with either the chemical or the trade name of the gas. Such marking shall be by means of stenciling, stamping, or labeling, and shall not be readily removable. Whenever

practical, the marking shall be located on the shoulder of the cylinder.

Note: This method conforms to the American National Standard Method for Marking Portable Compressed Gas Containers to Identify the Material Contained, ANSI Z 48.1-1954.

(b) Compressed gas cylinders shall be equipped with connections complying with the American National Standard Compressed Gas Cylinder Valve Outlet and Inlet Connections, ANSI B 57.1-1965.

(c) All cylinders with a water weight capacity of over thirty pounds shall be equipped with means of connecting a valve protection cap or with a collar or recess to protect the valve.

(2) Storage of cylinders - general.

(a) Cylinders shall be kept away from radiators and other sources of heat.

(b) Inside of buildings, cylinders shall be stored in a well-protected, well-ventilated, dry location, at least twenty feet from highly combustible materials such as oil or excelsior. Cylinders should be stored in definitely assigned places away from elevators, stairs, or gangways. Assigned storage spaces shall be located where cylinders will not be knocked over or damaged by passing or falling objects, or subject to tampering by unauthorized persons. Cylinders shall not be kept in unventilated enclosures such as lockers and cupboards.

(c) Empty cylinders shall have their valves closed.

(d) Valve protection caps, where cylinder is designed to accept a cap, shall always be in place, hand-tight, except when cylinders are in use or connected for use.

(3) Fuel-gas cylinder storage. Inside a building, cylinders, except those in actual use or attached ready for use, shall be limited to a total gas capacity of two thousand cubic feet or three hundred pounds of liquefied petroleum gas.

(a) For storage in excess of two thousand cubic feet total gas capacity of cylinders or three hundred pounds of liquefied petroleum gas, a separate room or compartment conforming to the requirements specified in WAC 296-24-68211 (6)(h) and (i) shall be provided, or cylinders shall be kept outside or in a special building. Special buildings, rooms or compartments shall have no open flame for heating or lighting and shall be well ventilated. They may also be used for storage of calcium carbide in quantities not to exceed six hundred pounds, when contained in metal containers complying with WAC 296-24-68213 (1)(a) and (b). Signs should be conspicuously posted in such rooms reading, "Danger—No smoking, matches or open lights," or other equivalent wording.

(b) Acetylene cylinders shall be stored valve end up.

(4) Oxygen storage.

(a) Oxygen cylinders shall 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.

(b) Oxygen cylinders stored in outside generator houses shall 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 shall be without openings and shall be gastight.

(c) Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum distance of twenty feet or by a noncombustible barrier at least five feet high having a fire-resistance rating of at least one-half hour.

(d) 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 thirteen thousand cubic feet of oxygen (measured at 14.7 psi(a) and 70°F), connected in service or ready for service, or more than twenty-five thousand cubic feet of oxygen (measured at 14.7 psi(a) and 70°F), including unconnected reserves on hand at the site, it shall comply with the provisions of the Standard for Bulk Oxygen Systems at Consumer Sites, NFPA No. 566-1965.

(5) Operating procedures.

(a) Cylinders, cylinder valves, couplings, regulators, hose, and apparatus shall be kept free from oily or greasy substances. Oxygen cylinders or apparatus shall 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.

(b) When transporting cylinders by a crane or derrick, a cradle, boat, or suitable platform shall be used. Slings or electric magnets shall not be used for this purpose. Valve-protection caps, where cylinder is designed to accept a cap, shall always be in place.

(c) Cylinders shall not be dropped or struck or permitted to strike each other violently.

(d) Valve-protection caps shall not be used for lifting cylinders from one vertical position to another. Bars shall not be used under valves or valve-protection caps to pry cylinders loose when frozen to the ground or otherwise fixed; the use of warm (not boiling) water is recommended. Valve-protection caps are designed to protect cylinder valves from damage.

(e) Unless cylinders are secured on a special truck, regulators shall be removed and valve-protection caps, when provided for, shall be put in place before cylinders are moved.

(f) Cylinders not having fixed hand wheels shall 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.

(g) Cylinder valves shall be closed before moving cylinders.

(h) Cylinder valves shall be closed when work is finished.

(i) Valves of empty cylinders shall be closed.

(j) Cylinders shall be kept far enough away from the actual welding or cutting operation so that sparks, hot slag, or flame will not reach them, or fire-resistant shields shall be provided.

(k) Cylinders shall not be placed where they might become part of an electric circuit. Contacts with third rails, trolley wires, etc., shall be avoided. Cylinders shall be kept away from radiators, piping systems, layout

tables, etc., that may be used for grounding electric circuits such as for arc welding machines. Any practice such as the tapping of an electrode against a cylinder to strike an arc shall be prohibited.

(l) Cylinders shall never be used as rollers or supports, whether full or empty.

(m) The numbers and markings stamped into cylinders shall not be tampered with.

(n) No person, other than the gas supplier, shall attempt to mix gases in a cylinder. No one, except the owner of the cylinder or person authorized by him, shall refill a cylinder.

(o) No one shall tamper with safety devices in cylinders or valves.

(p) Cylinders shall not be dropped or otherwise roughly handled.

(q) Unless connected to a manifold, oxygen from a cylinder shall not be used without first attaching an oxygen regulator to the cylinder valve. Before connecting the regulator to the cylinder valve, the valve shall be opened slightly for an instant and then closed. (Always stand to one side of the outlet when opening the cylinder valve.)

(r) A hammer or wrench shall not be used to open cylinder valves. If valves cannot be opened by hand, the supplier shall be notified.

(s) Cylinder valves shall not be tampered with nor should any attempt be made to repair them. If trouble is experienced, the supplier should be sent a report promptly indicating the character of the trouble and the cylinder's serial number. Supplier's instructions as to its disposition shall be followed.

(t) Complete removal of the stem from a diaphragm-type cylinder valve shall be avoided.

(u) Fuel-gas cylinders shall be placed with valve end up whenever they are in use. Liquefied gases shall be stored and shipped with the valve end up.

(v) Cylinders shall be handled carefully. Cylinders shall not be subjected to rough handling, knocks, or falls which are liable to damage the cylinder, valve or safety devices and cause leakage.

(w) Before connecting a regulator to a cylinder valve, the valve shall be opened slightly and closed immediately. The valve shall be opened while standing to one side of the outlet; never in front of it. Fuel-gas cylinder valves shall not be cracked near other welding work or near sparks, flame, or other possible sources of ignition.

(x) Before a regulator is removed from a cylinder valve, the cylinder valve shall be closed and the gas released from the regulator.

(y) Nothing shall be placed on top of an acetylene cylinder when in use which may damage the safety device or interfere with the quick closing of the valve.

(z) If cylinders are found to have leaky valves or fittings which cannot be stopped by closing of the valve, the cylinders shall be taken outdoors away from sources of ignition and slowly emptied.

(aa) A warning should be placed near cylinders having leaking fuse plugs or other leaking safety devices not to approach them with a lighted cigarette or other source of ignition. Such cylinders should be plainly

tagged; the supplier should be promptly notified and his instructions followed as to their return.

(bb) Safety devices shall not be tampered with.

(cc) Fuel-gas shall not be used from cylinders through torches or other devices equipped with shutoff valves without reducing the pressure through a suitable regulator attached to the cylinder valve or manifold.

(dd) The cylinder valve shall always be opened slowly.

(ee) An acetylene cylinder valve shall not be opened more than one and one-half turns of the spindle, and preferably no more than three-fourths of a turn.

(ff) Where a special wrench is required it shall be left in position on the stem of the valve while the cylinder is in use so that the fuel-gas flow can be quickly turned off in case of emergency. In the case of manifolded or coupled cylinders at least one such wrench shall always be available for immediate use.

(gg) When cylinders are transported by powered vehicle they shall be secured in a vertical position.

(hh) A suitable cylinder truck, chain, or other steadying device shall be used to prevent cylinders from being knocked over while in use.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-24-68203, filed 5/11/88; Order 73-5, § 296-24-68203, filed 5/9/73 and Order 73-4, § 296-24-68203, filed 5/7/73.]

Part J-1

WORKING SURFACES, GUARDING FLOORS AND WALL OPENINGS, LADDERS, SCAFFOLDS

WAC

- | | |
|--------------|----------------------------------------------------------------|
| 296-24-78009 | Care and use of ladders. |
| 296-24-82513 | Masons' adjustable multiple-point suspension scaffolds. |
| 296-24-82515 | Two-point suspension scaffolds (swinging scaffolds). |
| 296-24-82517 | Stone setters' adjustable multiple-point suspension scaffolds. |
| 296-24-82519 | Single-point adjustable suspension scaffolds. |

WAC 296-24-78009 Care and use of ladders. (1) Care. To insure safety and serviceability the following precautions on the care of ladders shall be observed:

(a) Ladders shall be maintained in good condition at all times, the joint between the steps and side rails shall be tight, all hardware and fittings securely attached, and the moveable parts shall operate freely without binding or undue play.

(b) Metal bearings of locks, wheels, pulleys, etc., shall be frequently lubricated.

(c) Frayed or badly worn rope shall be replaced.

(d) Safety feet and other auxiliary equipment shall be kept in good condition to insure proper performance.

(e) Ladders should be stored in such a manner as to provide ease of access or inspection, and to prevent danger of accident when withdrawing a ladder for use.

(f) Wood ladders, when not in use, should be stored at a location where they will not be exposed to the elements, but where there is good ventilation. They shall not be stored near radiators, stoves, steam pipes, or other places subjected to excessive heat or dampness.

(g) Ladders stored in a horizontal position should be supported at a sufficient number of points to avoid sagging and permanent set.

(h) 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.

(i) Ladders should be kept coated with a suitable protective material. The painting of ladders is satisfactory providing the ladders are carefully inspected prior to painting by competent and experienced inspectors acting for, and responsible to, the purchaser, and providing the ladders are not for resale.

(j) Ladders shall be inspected frequently and those which have developed defects shall be withdrawn from service for repair or destruction and tagged or marked as "dangerous, do not use."

(k) Rungs should be kept free of grease and oil.

(2) Use. The following safety precautions shall be observed in connection with the use of ladders:

(a) Portable rung and cleat ladders shall, where possible, be used at such a pitch that the horizontal distance from the top support to the foot of the ladder is one-quarter of the working length of the ladder (the length along the ladder between the foot and the top support). The ladder shall be so placed as to prevent slipping, or it shall be lashed, or held in position. Ladders shall not be used in a horizontal position as platforms, runways, or scaffolds.

(b) Ladders for which dimensions are specified should not be used by more than one man at a time nor with ladder jacks and scaffold planks where use by more than one man is anticipated. In such cases, specially designed ladders with larger dimensions of the parts should be procured.

(c) Portable ladders shall be so placed that the side rails have a secure footing. The top rest for portable rung and cleat ladders shall be reasonably rigid and shall have ample strength to support the applied load.

(d) Ladders shall not be placed in front of doors opening toward the ladder unless the door is blocked open, locked, or guarded.

(e) Ladders shall not be placed on boxes, barrels, or other unstable bases to obtain additional height.

(f) To support the top of the ladder at a window opening, a board should be attached across the back of the ladder, extending across the window and providing firm support against the building walls or window frames.

(g) When ascending or descending, the user should face the ladder.

(h) Ladders with broken or missing steps, rungs, or cleats, broken side rails, or other faulty equipment shall not be used; improvised repairs shall not be made.

(i) Short ladders shall not be spliced together to provide long sections.

(j) Ladders made by fastening cleats across a single rail shall not be used.

(k) Ladders shall not be used as guys, braces, or skids, or for other than their intended purposes.

(l) Tops of the ordinary types of stepladders shall not be used as steps.

(m) On two-section extension ladders the minimum overlap for the two sections in use shall be as follows:

Size of ladder (feet):	Overlap (feet)
Up to and including 36 _____	3
Over 36 up to and including 48 _____	4
Over 48 up to and including 60 _____	5

(n) Portable rung ladders with reinforced rails (see WAC 296-24-78007 (3)(b)(iii) and (iv)) shall be used only with the metal reinforcement on the under side. Ladders of this type should be used with great care near electrical conductors, since the reinforcing itself is a good conductor.

(o) No ladder should be used to gain access to a roof unless the top of the ladder shall extend at least three feet above the point of support, at eave, gutter, or roof line.

(p) Adjustment of extension ladders should only be made by the user when standing at the base of the ladder, so that the user may observe when the locks are properly engaged. Adjustment of extension ladders from the top of the ladder (or any level over the locking device) is a dangerous practice and should not be attempted. Adjustment should not be made while the user is standing on the ladder.

(q) Middle and top sections of sectional or window cleaner's ladders should not be used for bottom section unless the user equips them with safety shoes.

(r) Extension ladders should always be erected so that the upper section is resting on the bottom section.

(s) The user should equip all portable rung ladders with nonslip bases when there is a hazard of slipping. Nonslip bases are not intended as a substitute for care in safety placing, lashing, or holding a ladder that is being used upon oily metal, concrete, or slippery surfaces.

(t) The bracing on the back legs of step ladders is designed solely for increasing stability and not for climbing.

(u) When service conditions warrant, hooks may be attached at or near the top of portable ladders to give added security.

(v) Stepladders shall not be used as single ladders.

(w) Separate ladders for ascending and descending shall be provided in building construction of more than two stories in height, or where traffic is heavy.

(x) Where one broad ladder is used, a center rail shall be provided, and each side plainly marked "up" and "down."

(y) Ladder rungs shall not be used to support more than one section of plank, and not more than two men shall work on such section of planking at one and the same time. When two men are working on the same section of plank, their work should be so arranged that their weight is equally distributed between two ladders as nearly as possible.

(z) When ladders are used of a length sufficient to possess a tendency to spring when weight is applied, they shall be provided with bracing to overcome same. This applies particularly to extension ladders.

(aa) Before climbing ladders, workmen shall see that their shoes are free and clean of greasy or slippery substances.

(bb) When working from a stepladder over five feet high a workman shall not stand on a step higher than the third step from the top of the stepladder.

(cc) Ladders shall not be placed or used in elevator shafts or hoistways except where used by workmen engaged in work within such shafts or hoistways, and then they shall be protected from objects falling from operations at higher elevations in or adjoining the shaft.

(dd) Workmen shall not ascend or descend ladders while carrying tools or materials which will interfere with the free use of both hands.

(ee) Ladders shall pass the following test:

When tested as a simple beam with a support under each end and the center rung loaded with a two hundred pound load, the ladder must support this load for ten minutes without permanent set and without showing any sign of failure. The maximum deflection shall not be greater than shown in the enclosed table.

Lengths of extended ladder in feet	Distance of supports from ends, in inches	Total deflection, in inches
12	3	2 3/4
16	3	6 3/4
20	3	11 1/2
24	3	16 1/2
28	3	21 1/2
30	3	23 1/2
34	6	26
36	6	29
40	6	37
44	9	41

(ff) When working from a ladder over twenty-five feet from the ground or floor, the ladder shall be secured at both top and bottom.

(gg) No type of work shall be performed on a ladder over twenty-five feet from the ground or floor that requires the use of both hands to perform the work, unless a safety belt is worn and the safety lanyard is secured to the ladder.

(hh) Work such as sandblasting or spray painting, that requires wearing eye protection, respirators, and handling of pressure equipment, shall be limited to not over thirty feet from the ground or floor while working on a ladder.

TABLE D-5

CLASSIFICATION OF VARIOUS SPECIES OF WOOD ACCEPTABLE FOR USE IN LADDER

The species are listed alphabetically within each group. The position of any species within a group therefore bears no relation to its strength or acceptability.

Where ladders are desired for use under conditions favorable to decay, it is recommended that the heartwood of decay-resistant species be used, or that the wood be given a treatment with a wood preservative. The species having the most durable heartwood are marked

with an asterisk (*), and these should be preferred where resistance to decay is required.

GROUP 1

The allowable fiber stress in bending for the species listed herein when used for side rails shall not exceed two thousand one hundred fifty pounds per square inch. These species may be substituted for Group 3 woods on the following basis: The dimensions may be not more than ten percent smaller for each cross-section dimension, or the thickness may remain unchanged, in which case the width may not be more than fifteen percent smaller if used edgewise (as in a rail) or twenty-five percent smaller if used flatwise (as in a tread).

White ash	Fraxinus americana, pennsylvanica, quadrangulata
Beech	Fagus grandifolia
Birch	Betula lenta, alleghaniensis, nigra (2)
Rock elm	Ulmus thomasii
Hickory	Carya ovata, laciniosa, tomentosa, glabra
Locust*	Robinia pseudoacacia, Gleditsia triacanthos
Hard maple	Acer nigrum, saccharum
Red maple	Acer rubrum (3)
Red oak	Quercus velutina, marilandica, kelloggii, falcata var. pagodaefolia, laurifolia, ellipsoidalis, rubra, nuttallii, palustris, coccinea, shumardii, falcata, laevis, phellos
White oak	Quercus arizonica, douglasii, macrocarpa, lobata, prinus, muehlenbergii, emoryi, gambelii, oblongifolia, virginiana, garryana, lyrata, stellata, michauxii, bicolor, alba
Pecan	Carya illinoensis, cordiformis, myristicaeformis (4), aquatica (4)
Persimmon	Diospyros virginiana

GROUP 2

The allowable fiber stress in bending for the species listed herein when used for side rails shall not exceed two thousand pounds per square inch. These species may be substituted for Group 3 woods on the following basis: The dimensions may be not more than seven and one-half percent smaller for each cross-section dimension, or the thickness may remain unchanged, in which case the width may be not more than eleven percent smaller if used edgewise (as in a rail) or twenty percent smaller if used flatwise (as in a tread).

Douglas fir (coast region)	Pseudotsuga menziesii
Western larch	Larix occidentalis
Southern yellow pine	Pinus taeda, palustris, echinata, elliotii, rigida, virginiana

GROUP 3

The allowable fiber stress in bending for the species listed herein when used for side rails shall not exceed one thousand six hundred pounds per square inch.

Red alder	Alnus rubra, rhombifolia (2)
Oregon ash	Fraxinus latifolia
Pumpkin ash	Fraxinus profunda
Alaska cedar*	Chamaecyparis nootkatensis
Port Orford cedar*	Chamaecyparis lawsoniana
Cucumber	Magnolia acuminata
Cypress*	Taxodium distichum
Soft elm	Ulmus americana, rubra
Douglas fir (Rocky Mountain type)	Pseudotsuga menziesii var. glauca
Noble fir	Abies procera

Gum	Liquidambar styraciflua
West coast hemlock	Tsuga heterophylla
Magnolia	Magnolia grandiflora
Oregon maple	Acer macrophyllum
Norway pine	Pinus resinosa
Poplar	Liriodendron tulipifera
Redwood*	Sequoia sempervirens
Eastern spruce	Picea glauca, rubens
Sitka spruce	Picea sitchensis
Sycamore	Platanus occidentalis
Tamarack	Larix laricina
Tupelo	Nyssa aquatica, sylvatica

GROUP 4

The allowable fiber stress in bending for the species listed herein when used for side rails shall not exceed one thousand three hundred seventy-five pounds per square inch. These species may be substituted for Group 3 woods on the following basis: The dimensions shall be at least five percent greater for each cross-section dimension, or the thickness may remain unchanged, in which case the width shall be at least seven and one-half percent greater if used edgewise (as in a rail) or fifteen percent greater if used flatwise (as in a tread).

Aspen	Populus tremuloides, grandidentata
Basswood	Tilia americana, heterophylla (2)
Buckeye	Aesculus octandra, glabra (2)
Butternut	Juglanscinerea
Incense cedar*	Libocedrus decurrens
Western red cedar*	Thuja plicata
Cottonwood	Populus balsamifera, deltoides, sargentii, heterophylla
White fir	Abies concolor, grandis, amabilis, lasiocarpa, magnifica
Hackberry	Celtis occidentalis, laevigata (2)
Eastern hemlock	Tsuga canadensis
Holly	Ilex opaca
Soft maple	Acer saccharinum
Lodgepole pine	Pinus contorta
Idaho white pine	Pinus monticola
Northern white pine	Pinus strobus
Ponderosa pine	Pinus ponderosa, pinus jeffreyi (Jeffrey pine)
Sugar pine	Pinus lambertiana
Engelmann spruce	Picea engelmannii

Note 1: The common and scientific names of species used conform to the American Lumber Standards nomenclature and in most cases to U.S. Department of Agriculture Handbook No. 41, "Check List of Native and Naturalized Trees of the United States (including Alaska)," by Elbert L. Little. These publications can be obtained from the Superintendent of Documents, Washington D.C. 20225.

Note 2: This species is commonly associated with others of the same genus under American Lumber Standards nomenclature, but no strength tests have been made on it at the Forest Products Laboratory.

Note 3: Included under soft maple in American Lumber Standards nomenclature.

Note 4: This species is not included under this common name in American Lumber Standards nomenclature, but strength data are available and it is accordingly included in this classification.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-24-78009, filed 5/11/88. Statutory Authority: RCW 49.17.040, 49.17.150 and 49.17.240. 79-08-115 (Order 79-9), § 296-24-78009, filed 7/31/79; Order 76-6, § 296-24-78009, filed 3/1/76; Order 73-5, § 296-24-78009, filed 5/9/73 and Order 73-4, § 296-24-78009, filed 5/7/73.]

WAC 296-24-82513 Masons' adjustable multiple-point suspension scaffolds. (1) The scaffold shall be capable of sustaining a working load of fifty pounds per

square foot and shall not be loaded in excess of that figure.

(2) The scaffold shall be provided with hoisting machines that meet the requirements of a nationally recognized testing laboratory. Refer to federal regulation 29 CFR 1910.7 for definition of a nationally recognized testing laboratory.

(3) The platform shall be supported by wire ropes in conformity with WAC 296-24-82503(22), suspended from overhead outrigger beams.

(4) The scaffold outrigger beams shall consist of structural metal securely fastened or anchored to the frame or floor system of the building or structure.

(5) Each outrigger beam shall be equivalent in strength to at least a standard seven-inch, 15.3-pound steel I-beam, be at least fifteen feet long, and shall not project more than six feet six inches beyond the bearing point.

(6) Where the overhang exceeds six feet six inches, outrigger beams shall be composed of stronger beams or multiple beams and be installed in accordance with approved designs and instructions.

(7) If channel iron outrigger beams are used in place of I-beams, they shall be securely fastened together with the flanges turned out.

(8) All outrigger beams shall be set and maintained with their webs in a vertical position.

(9) A stop bolt shall be placed at each end of every outrigger beam.

(10) The outrigger beam shall rest on suitable wood-bearing blocks.

(11) All parts of the scaffold such as bolts, nuts, fittings, clamps, wire rope, and outrigger beams and their fastenings, shall be maintained in sound and good working condition and shall be inspected before each installation and periodically thereafter.

(12) The free end of the suspension wire ropes shall be equipped with proper size thimbles and be secured by splicing or other equivalent means. The running ends shall be securely attached to the hoisting drum and at least four turns of rope shall at all times remain on the drum.

(13) Where a single outrigger beam is used, the steel shackles or clevises with which the wire ropes are attached to the outrigger beams shall be placed directly over the hoisting drums.

(14) The scaffold platform shall be equivalent in strength to at least two-inch planking. (For maximum planking spans see WAC 296-24-82503(22).)

(15) Guardrails not less than two by four inches or the equivalent and not less than thirty-six inches or more than forty-two inches high, with a mid-rail, when required, of one-inch by four-inch nominal lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than eight feet above the ground or floor. Toeboards shall be a minimum of four inches nominal lumber in height. Wire mesh shall be installed in accordance with WAC 296-24-82503(17).

(16) Overhead protection shall be provided on the scaffold, not more than nine feet above the platform, consisting of two-inch planking or material of equivalent

strength laid tight, when men are at work on the scaffold and an overhead hazard exists.

(17) Each scaffold shall be installed or relocated in accordance with designs and instructions, of a registered professional engineer, and supervised by a competent, designated person to comply with the requirements of this section.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-82513, filed 11/14/88; Order 73-5, § 296-24-82513, filed 5/9/73 and Order 73-4, § 296-24-82513, filed 5/7/73.]

WAC 296-24-82515 Two-point suspension scaffolds (swinging scaffolds). (1) Two-point suspension scaffold platforms shall be not less than twenty inches nor more than thirty-six inches wide overall. The platform shall be securely fastened to the hangers by U-bolts or by other equivalent means.

(2) The hangers of two-point suspension scaffolds shall be made of wrought iron, mild steel, or other equivalent material having a cross-sectional area capable of sustaining four times the maximum intended load, and shall be designed with a support for guardrail, intermediate rail, and toeboard.

(3) When hoisting machines are used on two-point suspension scaffolds, such machines shall be of a design tested and approved by a nationally recognized testing laboratory. Refer to federal regulation 29 CFR 1910.7 for definition of nationally recognized testing laboratory.

(4) The roof irons or hooks shall be of wrought iron, mild steel, or other equivalent material of proper size and design, securely installed and anchored. Tiebacks of three-fourths-inch manila rope or the equivalent shall serve as a secondary means of anchorage, installed at right angles to the face of the building whenever possible and secured to a structurally sound portion of the building.

(5) Guardrails not less than two by four inches or the equivalent and not less than thirty-six inches or more than forty-two inches high, with a mid-rail, when required, of one-inch by four-inch nominal lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than ten feet above the ground or floor. Toeboards shall be a minimum of four inches nominal lumber in height. Wire mesh shall be installed in accordance with WAC 296-24-82503(17).

(6) Two-point suspension scaffolds shall be suspended by wire or fiber ropes. Wire and fiber ropes shall conform to WAC 296-24-82503(22).

(7) The blocks for fiber ropes shall be of standard six-inch size, consisting of at least one double and one single block. The sheaves of all blocks shall fit the size of rope used.

(8) All wire ropes, fiber ropes, slings, hangers, platforms, and other supporting parts shall be inspected before every installation. Periodic inspections shall be made while the scaffold is in use.

(9) On suspension scaffolds designed for a working load of five hundred pounds, no more than two men shall be permitted to work at one time. On suspension scaffolds with a working load of seven hundred fifty pounds, no more than three men shall be permitted to work at

one time. Each workman shall be protected by a safety lifeline attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the workman in case of a fall.

(10) Where acid solutions are used, fiber ropes are not permitted unless acid-proof.

(11) Two-point suspension scaffolds shall be securely lashed to the building or structure to prevent them from swaying. Window cleaners' anchors shall not be used for this purpose.

(12) The platform of every two-point suspension scaffold shall be one of the following types:

(a) The side stringer of ladder-type platforms shall be clear straight-grained spruce or materials of equivalent strength and durability. The rungs shall be of straight-grained oak, ash, or hickory, at least one and one-eighths-inch in diameter, with seven-eighths inch tenons mortised into the side stringers at least seven-eighths inch. The stringers shall be tied together with the tie rods not less than one-quarter inch in diameter, passing through the stringers and riveted up tight against washers on both ends. The flooring strips shall be spaced not more than five-eighths inch apart except at the side rails where the space may be one inch. Ladder-type platforms shall be constructed in accordance with Table D-17.

(b) Plank-type platforms shall be composed of not less than nominal two-inch by eight-inch unspliced planks, properly cleated together on the underside starting six inches from each end; intervals in between shall not exceed four feet. The plank-type platform shall not extend beyond the hangers more than eighteen inches. A bar or other effective means shall be securely fastened to the platform at each end to prevent its slipping off the hanger. The span between hangers for plank-type platforms shall not exceed ten feet.

(c) Beam platforms shall have side stringers of lumber not less than two by six inches set on edge. The span between hangers shall not exceed twelve feet when beam platforms are used. The flooring shall be supported on two-inch and six-inch crossbeams, laid flat and set into the upper edge of the stringers with a snug fit, at intervals of not more than four feet, securely nailed in place. The flooring shall be of one-inch by six-inch material properly nailed. Floorboards shall not be spaced more than one-half inch apart. (See Table D-17.)

TABLE D-17

SCHEDULE FOR LADDER-TYPE PLATFORMS

	Length of platform (feet)				
	12	14&16	18&20	22&24	28&30
Side stringers, minimum cross section (finished sizes):					
At ends (in.)	1 3/4 x2 3/4	1 3/4 x2 3/4	1 3/4 x3	1 3/4 x3	1 3/4 x3 1/2
At middle (in.)	1 3/4 x3 3/4	1 3/4 x3 3/4	1 3/4 x4	1 3/4 x4 1/4	1 3/4 x5

TABLE D-17
SCHEDULE FOR LADDER-TYPE PLATFORMS

	Length of platform (feet)				
	12	14&16	18&20	22&24	28&30
Reinforcing strip (minimum) —	A 1/8x7/8-in. steel reinforcing strip or its equivalent shall be attached to the side or underside, full length.				
Rungs —	Rungs shall be 1 1/8-in. minimum diameter with at least 7/8-in. diameter tenons, and the maximum spacing shall be 12 in. center to center.				
Tie rods:					
Number (minimum) —	3	4	4	5	6
Diameter (minimum) —	1/4 in.	1/4 in.	1/4 in.	1/4 in.	1/4 in.
Flooring, minimum finished size (in.) —	1/2 x 2 3/4	1/2 x 2 3/4	1/2 x 2 3/4	1/2 x 2 3/4	1/2 x 2 3/4

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-82515, filed 11/14/88. Statutory Authority: RCW 49.17.040, 49.17.050, and 49.17.240. 80-11-010 (Order 80-14), § 296-24-82515, filed 8/8/80. Statutory Authority: RCW 49.17.040, 49.17.150, and 49.17.240. 79-08-115 (Order 79-9), § 296-24-82515, filed 7/31/79; Order 73-5, § 296-24-82515, filed 5/9/73 and Order 73-4, § 296-24-82515, filed 5/7/73.]

WAC 296-24-82517 Stone setters' adjustable multiple-point suspension scaffolds. (1) The scaffold shall be capable of sustaining a working load of 25 pounds per square foot and shall not be overloaded. Scaffolds shall not be used for storage of stone or other heavy materials.

(2) The hoisting machine and its supports shall be of a type tested and listed by a nationally recognized testing laboratory. Refer to WAC 296-24-95601(77) for definition of listed, and 29 CFR 1910.7 for nationally recognized testing laboratory.

(3) The platform shall be securely fastened to the hangers by U-bolts or other equivalent means.

(4) The scaffold unit shall be suspended from metal outriggers, iron brackets, wire rope slings, or iron hooks which will safely support the maximum intended load.

(5) Outriggers when used shall be set with their webs in a vertical position, securely anchored to the building or structure and provided with stop bolts at each end.

(6) The scaffold shall be supported by wire rope conforming with WAC 296-24-82503(22), suspended from overhead supports.

(7) The free ends of the suspension wire ropes shall be equipped with proper size thimbles, secured by splicing or other equivalent means. The running ends shall be securely attached to the hoisting drum and at least four turns of rope shall remain on the drum at all times.

(8) Guardrails not less than 2 by 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- by 4-inch nominal lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more

than 10 feet above the ground or floor. Toeboards shall be a minimum of 4 inches nominal lumber in height. Wire mesh shall be installed in accordance with WAC 296-24-82503(17).

(9) When two or more scaffolds are used on a building or structure they shall not be bridged one to the other but shall be maintained at even height with platforms butting closely.

(10) Each scaffold shall be installed or relocated in accordance with designs and instructions of a registered professional engineer, and such installation or relocation shall be supervised by a competent designated person to comply with requirements of this section.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-82517, filed 11/14/88. Statutory Authority: RCW 49.17.040, 49.17.150, and 49.17.240. 79-08-115 (Order 79-9), § 296-24-82517, filed 7/31/79; Order 73-5, § 296-24-82517, filed 5/9/73 and Order 73-4, § 296-24-82517, filed 5/7/73.]

WAC 296-24-82519 Single-point adjustable suspension scaffolds. (1) The scaffolding, including power units or manually operated winches, shall be of a type tested and listed by a nationally recognized testing laboratory. Refer to WAC 296-24-95601(77) for definition of listed, and 29 CFR 1910.7 for nationally recognized testing laboratory.

(2) The power units may be either electrically or air motor driven.

(3) All power-operated gears and brakes shall be enclosed.

(4) In addition to the normal operating brake, all-power driven units must have an emergency brake which engages automatically when the normal speed of descent is exceeded.

(5) Guards, mid-rails, and toeboards shall completely enclose the cage or basket. Guardrails shall be no less than 2 by 4 inches nominal lumber or the equivalent installed no less than 36 inches nor more than 42 inches above the platform. Mid-rails shall be 1 by 6 inches nominal lumber or the equivalent, installed equidistant between the guardrail and the platform. Toeboards shall be a minimum of 4 inches nominal lumber in height.

(6) The hoisting machines, cables, and equipment shall be regularly serviced and inspected after each installation and every 30 days thereafter.

(7) The units may be combined to form a two-point suspension scaffold. Such scaffold shall comply with WAC 296-24-82515.

(8) The supporting cable shall be straight for its entire length, and the operator shall not sway the basket and fix the cable to any intermediate points to change his original path of travel.

(9) Equipment shall be maintained and used in accordance with the manufacturers' instructions.

(10) Suspension methods shall conform to applicable provisions of WAC 296-24-82515 and 296-24-82517.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-82519, filed 11/14/88; Order 73-5, § 296-24-82519, filed 5/9/73 and Order 73-4, § 296-24-82519, filed 5/7/73.]

Part L
ELECTRICAL

WAC

- 296-24-95601 Definitions applicable to WAC 296-24-956 through 296-24-95615.
 296-24-95603 Electric utilization systems.
 296-24-95605 General requirements.
 296-24-95607 Wiring design and protection.
 296-24-95609 Wiring methods, components, and equipment for general use.
 296-24-95611 Specific purpose equipment and installations.
 296-24-95613 Hazardous (classified) locations.

WAC 296-24-95601 Definitions applicable to WAC 296-24-956 through 296-24-95615. Unless the context indicates otherwise, words used in this section shall have the meaning given.

(1) **Acceptable.** An installation or equipment is acceptable to the director of labor and industries, and approved within the meaning of this section:

(a) If it is accepted, or certified, or listed, or labeled, or otherwise determined to be safe by a nationally recognized testing laboratory; or

(b) With respect to an installation or equipment of a kind which no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, if it is inspected or tested by another federal agency, or by a state, municipal, or other local authority responsible for enforcing occupational safety provisions of the National Electrical Code, and found in compliance with the provisions of the National Electrical Code as applied in this section; or

(c) With respect to custom-made equipment or related installations which are designed, fabricated for, and intended for use by a particular customer, if it is determined to be safe for its intended use by its manufacturer on the basis of test data which the employer keeps and makes available for inspection to the director and his authorized representatives. Refer to federal regulation 29 CFR 1910.7 for definition of nationally recognized testing laboratory.

(2) **Accepted.** An installation is "accepted" if it has been inspected and found by a nationally recognized testing laboratory to conform to specified plans or to procedures of applicable codes.

(3) **Accessible.** (As applied to wiring methods.) Capable of being removed or exposed without damaging the building structure of finish, or not permanently closed in by the structure or finish of the building. (See "concealed" and "exposed.")

(4) **Accessible.** (As applied to equipment.) Admitting close approach; not guarded by locked doors, elevation, or other effective means. (See "readily accessible.")

(5) **Ampacity.** Current-carrying capacity of electric conductors expressed in amperes.

(6) **Appliances.** Utilization equipment, generally other than industrial, normally built in standardized sizes or types, which is installed or connected as a unit to perform one or more functions such as clothes washing, air conditioning, food mixing, deep frying, etc.

(7) **Approved.** Acceptable to the authority enforcing this section. The authority enforcing this section is the

director of labor and industries. The definition of "acceptable" indicates what is acceptable to the director and therefore approved within the meaning of this section.

(8) **Approved for the purpose.** Approved for a specific purpose, environment, or application described in a particular standard requirement.

Suitability of equipment or materials for a specific purpose, environment or application may be determined by a nationally recognized testing laboratory, inspection agency or other organization concerned with product evaluation as part of its listing and labeling program. (See "labeled" or "listed.")

(9) **Armored cable.** Type AC armored cable is a fabricated assembly of insulated conductors in a flexible metallic enclosure.

(10) **Askarel.** A generic term for a group of nonflammable synthetic chlorinated hydrocarbons used as electrical insulating media. Askarels of various compositional types are used. Under arcing conditions the gases produced, while consisting predominantly of noncombustible hydrogen chloride, can include varying amounts of combustible gases depending upon the askarel type.

(11) **Attachment plug (plug cap) (cap).** A device which, by insertion in a receptacle, establishes connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle.

(12) **Automatic.** Self-acting, operating by its own mechanism when actuated by some impersonal influence, as, for example, a change in current strength, pressure, temperature, or mechanical configuration.

(13) **Bare conductor, see "conductor."**

(14) **Bonding.** The permanent joining of metallic parts to form an electrically conductive path which will assure electrical continuity and the capacity to conduct safely any current likely to be imposed.

(15) **Bonding jumper.** A reliable conductor to assure the required electrical conductivity between metal parts required to be electrically connected.

(16) **Branch circuit.** The circuit conductors between the final overcurrent device protecting the circuit and the outlet(s).

(17) **Building.** A structure which stands alone or which is cut off from adjoining structures by fire walls with all openings therein protected by approved fire doors.

(18) **Cabinet.** An enclosure designed either for surface or flush mounting, and provided with a frame, mat, or trim in which a swinging door or doors are or may be hung.

(19) **Cable tray system.** A cable tray system is a unit or assembly of units or sections, and associated fittings, made of metal or other noncombustible materials forming a rigid structural system used to support cables. Cable tray systems include ladders, troughs, channels, solid bottom trays, and other similar structures.

(20) **Cablebus.** Cablebus is an approved assembly of insulated conductors with fittings and conductor terminations in a completely enclosed, ventilated, protective metal housing.

(21) **Center pivot irrigation machine.** A center pivot irrigation machine is a multimotored irrigation machine which revolves around a central pivot and employs alignment switches or similar devices to control individual motors.

(22) **Certified.** Equipment is "certified" if it (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 of a kind whose production is periodically inspected by a nationally recognized testing laboratory, and (c) it bears a label, tag, or other record of certification.

(23) **Circuit breaker.**

(a) **(600 volts nominal, or less.)** A device designed to open and close a circuit by nonautomatic means and to open the circuit automatically on a predetermined over-current without injury to itself when properly applied within its rating.

(b) **(Over 600 volts, nominal.)** A switching device capable of making, carrying, and breaking currents under normal circuit conditions, and also making, carrying for a specified time, and breaking currents under specified abnormal circuit conditions, such as those of short circuit.

(24) **Class I locations.** Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. Class I locations include the following:

(a) **Class I, Division 1.** A Class I, Division 1 location is a location:

(i) In which hazardous concentrations of flammable gases or vapors may exist under normal operating conditions; or

(ii) In which hazardous concentrations of such gases or vapors may exist frequently because of repair or maintenance operations or because of leakage; or

(iii) In which breakdown or faulty operation of equipment or processes might release hazardous concentrations of flammable gases or vapors, and might also cause simultaneous failure of electric equipment.

Note: This classification usually includes locations where volatile flammable liquids or liquefied flammable gases are transferred from one container to another; interiors of spray booths and areas in the vicinity of spraying and painting operations where volatile flammable solvents are used; locations containing open tanks or vats of volatile flammable liquids; drying rooms or compartments for the evaporation of flammable solvents; locations containing fat and oil extraction equipment using volatile flammable solvents; portions of cleaning and dyeing plants where flammable liquids are used; gas generator rooms and other portions of gas manufacturing plants where flammable gas may escape; inadequately ventilated pump rooms for flammable gas or for volatile flammable liquids; the interiors of refrigerators and freezers in which volatile flammable materials are stored in open, lightly stoppered, or easily ruptured containers; and all other locations where ignitable concentrations of flammable vapors or gases are likely to occur in the course of normal operations.

(b) **Class I, Division 2.** A Class I, Division 2 location is a location:

(i) In which volatile flammable liquids or flammable gases are handled, processed, or used, but in which the

hazardous liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems, or in case of abnormal operation of equipment; or

(ii) In which hazardous concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operations of the ventilating equipment; or

(iii) That is adjacent to a Class I, Division 1 location, and to which hazardous concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.

Note: This classification usually includes locations where volatile flammable liquids or flammable gases or vapors are used, but which would become hazardous only in case of an accident or of some unusual operating condition. The quantity of flammable material that might escape in case of accident, the adequacy of ventilating equipment, the total area involved, and the record of the industry or business with respect to explosions or fires are all factors that merit consideration in determining the classification and extent of each location.

Piping without valves, checks, meters, and similar devices would not ordinarily introduce a hazardous condition even though used for flammable liquids or gases. Locations used for the storage of flammable liquids or a liquefied or compressed gases in sealed containers would not normally be considered hazardous unless also subject to other hazardous conditions.

Electrical conduits and their associated enclosures separated from process fluids by a single seal or barrier are classed as a Division 2 location if the outside of the conduit and enclosures is a nonhazardous location.

(25) **Class II locations.** Class II locations are those that are hazardous because of the presence of combustible dust. Class II locations include the following:

(a) **Class II, Division 1.** A Class II, Division 1 location is a location:

(i) In which combustible dust is or may be in suspension in the air under normal operating conditions, in quantities sufficient to produce explosives or ignitable mixtures; or

(ii) Where mechanical failure or abnormal operation of machinery or equipment might cause such explosive or ignitable mixtures to be produced, and might also provide a source of ignition through simultaneous failure of electric equipment, operation of protection devices, or from other causes; or

(iii) In which combustible dusts of an electrically conductive nature may be present.

Note: 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 which 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 which are electrically nonconductive include dusts produced in the handling and processing of grain

and grain products, pulverized sugar and cocoa, dried egg and milk powders, pulverized spices, starch and pastes, potato and woodflour, oil meal from beans and seed, dried hay, and other organic materials which may produce combustible dusts when processed or handled. Dusts containing magnesium or aluminum are particularly hazardous and the use of extreme caution is necessary to avoid ignition and explosion.

(b) **Class II, Division 2.** A Class II, Division 2 location is a location in which:

(i) Combustible dust will not normally be in suspension in the air in quantities sufficient to produce explosive or ignitable mixtures; and dust accumulations are normally insufficient to interfere with the normal operation of electrical equipment or other apparatus; or

(ii) Dust may be in suspension in the air as a result of infrequent malfunctioning of handling or processing equipment, and dust accumulations resulting therefrom may be ignitable by abnormal operation or failure of electrical equipment or other apparatus.

Note: This classification includes locations where dangerous concentrations of suspended dust would not be likely but where dust accumulations might form on or in the vicinity of electric equipment. These areas may contain equipment from which appreciable quantities of dust would escape under abnormal operating conditions or be adjacent to a Class II Division 1 location, as described above, into which an explosive or ignitable concentration of dust may be put into suspension under abnormal operating conditions.

(26) **Class III locations.** Class III locations are those that are hazardous because of the presence of easily ignitable fibers or flyings but in which such fibers or flyings are not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures. Class III locations include the following:

(a) **Class III, Division 1.** A Class III, Division 1 location is a location in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.

Note: Such locations usually include some parts of rayon, cotton, and other textile mills; combustible fiber manufacturing and processing plants; cotton gins and cottonseed mills; flax-processing plants; clothing manufacturing plants; woodworking plants, and establishments; 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.** A Class III, Division 2 location is a location in which easily ignitable fibers are stored or handled, except in process of manufacture.

(27) **Collector ring.** A collector ring is an assembly of slip rings for transferring electrical energy from a stationary to a rotating member.

(28) **Concealed.** Rendered inaccessible by the structure or finish of the building. Wires in concealed raceways are considered concealed, even though they may become accessible by withdrawing them. (See "accessible. (As applied to wiring methods.)")

(29) **Conductor.**

(a) **Bare.** A conductor having no covering or electrical insulation whatsoever.

(b) **Covered.** A conductor encased within material of composition or thickness that is not recognized as electrical insulation.

(c) **Insulated.** A conductor encased within material of composition and thickness that is recognized as electrical insulation.

(30) **Conduit body.** A separate portion of a conduit or tubing system that provides access through a removable cover(s) to the interior of the system at a junction of two or more sections of the system or at a terminal point of the system. Boxes such as FS and FD or larger cast or sheet metal boxes are not classified as conduit bodies.

(31) **Controller.** A device or group of devices that serves to govern, in some predetermined manner, the electric power delivered to the apparatus to which it is connected.

(32) **Cooking unit, counter-mounted.** A cooking appliance designed for mounting in or on a counter and consisting of one or more heating elements, internal wiring, and built-in or separately mountable controls. (See "oven, wall-mounted.")

(33) **Covered conductor.** See "conductor."

(34) **Cutout.** (Over 600 volts, nominal.) An assembly of a fuse support with either a fuseholder, fuse carrier, or disconnecting blade. The fuseholder or fuse carrier may include a conducting element (fuse link), or may act as the disconnecting blade by the inclusion of a nonfusible member.

(35) **Cutout box.** An enclosure designed for surface mounting and having swinging doors or covers secured directly to and telescoping with the walls of the box proper. (See "cabinet.")

(36) **Damp location.** See "location."

(37) **Dead front.** Without live parts exposed to a person on the operating side of the equipment.

(38) **Device.** A unit of an electrical system which is intended to carry but not utilize electric energy.

(39) **Dielectric heating.** Dielectric heating is the heating of a nominally insulating material due to its own dielectric losses when the material is placed in a varying electric field.

(40) **Disconnecting means.** A device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.

(41) **Disconnecting (or isolating) switch.** (Over 600 volts, nominal.) A mechanical switching device used for isolating a circuit or equipment from a source of power.

(42) **Dry location.** See "location."

(43) **Electric sign.** A fixed, stationary, or portable self-contained, electrically illuminated utilization equipment with words or symbols designed to convey information or attract attention.

(44) **Enclosed.** Surrounded by a case, housing, fence or walls which will prevent persons from accidentally contacting energized parts.

(45) **Enclosure.** The case or housing of apparatus, or the fence or walls surrounding an installation to prevent personnel from accidentally contacting energized parts, or to protect the equipment from physical damage.

(46) **Equipment.** A general term including material, fittings, devices, appliances, fixtures, apparatus, and the

like, used as a part of, or in connection with, an electrical installation.

(47) **Equipment grounding conductor.** See "grounding conductor, equipment."

(48) **Explosion-proof apparatus.** Apparatus enclosed in a case that is capable of withstanding an explosion of a specified gas or vapor which may occur within it and of preventing the ignition of a specified gas or vapor surrounding the enclosure by sparks, flashes, or explosion of the gas or vapor within, and which operates at such an external temperature that it will not ignite a surrounding flammable atmosphere.

(49) **Exposed.** (As applied to live parts.) Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts not suitably guarded, isolated, or insulated. (See "accessible" and "concealed.")

(50) **Exposed.** (As applied to wiring methods.) On or attached to the surface or behind panels designed to allow access. (See "accessible. (As applied to wiring methods.)")

(51) **Exposed.** (For the purpose of WAC 296-24-95615(5), communications systems.) Where the circuit is in such a position that in case of failure of supports or insulation, contact with another circuit may result.

(52) **Externally operable.** Capable of being operated without exposing the operator to contact with live parts.

(53) **Feeder.** All circuit conductors between the service equipment, or the generator switchboard of an isolated plant, and the final branch-circuit overcurrent device.

(54) **Fitting.** An accessory such as a locknut, bushing, or other part of a wiring system that is intended primarily to perform a mechanical rather than an electrical function.

(55) **Fuse.** (Over 600 volts, nominal.) An overcurrent protective device with a circuit opening fusible part that is heated and severed by the passage of overcurrent through it. A fuse comprises all the parts that form a unit capable of performing the prescribed functions. It may or may not be the complete device necessary to connect it into an electrical circuit.

(56) **Ground.** A conducting connection, whether intentional or accidental, between an electrical circuit or equipment and the earth, or to some conducting body that serves in place of the earth.

(57) **Grounded.** Connected to earth or to some conducting body that serves in place of the earth.

(58) **Grounded, effectively.** (Over 600 volts, nominal.) Permanently connected to earth through a ground connection of sufficiently low impedance and having sufficient ampacity that ground fault current which may occur cannot build up to voltages dangerous to personnel.

(59) **Grounded conductor.** A system or circuit conductor that is intentionally grounded.

(60) **Grounding conductor.** A conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes.

(61) **Grounding conductor, equipment.** The conductor used to connect the noncurrent-carrying metal parts of

equipment, raceways, and other enclosures to the system grounded conductor and/or the grounding electrode conductor at the service equipment or at the source of a separately derived system.

(62) **Grounding electrode conductor.** The conductor used to connect the grounding electrode to the equipment grounding conductor and/or to the grounded conductor of the circuit at the service equipment or at the source of a separately derived system.

(63) **Ground-fault circuit-interrupter.** A device whose function is to interrupt the electric circuit to the load when a fault current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit.

(64) **Guarded.** Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, or platforms to remove the likelihood of approach to a point of danger or contact by persons or objects.

(65) **Health care facilities.** Buildings or portions of buildings and mobile homes that contain, but are not limited to, hospitals, nursing homes, extended care facilities, clinics, and medical and dental offices, whether fixed or mobile.

(66) **Heating equipment.** For the purposes of WAC 296-24-95611(7), the term "heating equipment" includes any equipment used for heating purposes if heat is generated by induction or dielectric methods.

(67) **Hoistway.** Any shaftway, hatchway, well hole, or other vertical opening or space in which an elevator or dumbwaiter is designed to operate.

(68) **Identified.** Identified, as used in reference to a conductor or its terminal, means that such conductor or terminal can be readily recognized as grounded.

(69) **Induction heating.** Induction heating is the heating of a nominally conductive material due to its own I²R losses when the material is placed in a varying electromagnetic field.

(70) **Insulated conductor.** See "conductor."

(71) **Interrupter switch.** (Over 600 volts, nominal.) A switch capable of making, carrying, and interrupting specified currents.

(72) **Irrigation machine.** An irrigation machine is an electrically driven or controlled machine, with one or more motors, not hand portable, and used primarily to transport and distribute water for agricultural purposes.

(73) **Isolated.** Not readily accessible to persons unless special means for access are used.

(74) **Isolated power system.** A system comprising an isolating transformer or its equivalent, a line isolation monitor, and its ungrounded circuit conductors.

(75) **Labeled.** Equipment is "labeled" if there is attached to it a label, symbol, or other identifying mark of a nationally recognized testing laboratory which, (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.

(76) **Lighting outlet.** An outlet intended for the direct connection of a lampholder, a lighting fixture, or a pendant cord terminating in a lampholder.

(77) **Listed.** Equipment is "listed" if it is of a kind mentioned in a list which, (a) is published by a nationally recognized laboratory which makes periodic inspection of the production of such equipment, and (b) states such equipment meets nationally recognized standards or has been tested and found safe for use in a specified manner.

(78) **Location.**

(a) **Damp location.** Partially protected locations under canopies, marquees, roofed open porches, and like locations, and interior locations subject to moderate degrees of moisture, such as some basements, some barns, and some cold-storage warehouses.

(b) **Dry location.** A location not normally subject to dampness or wetness. A location classified as dry may be temporarily subject to dampness or wetness, as in the case of a building under construction.

(c) **Wet location.** Installations underground or in concrete slabs or masonry in direct contact with the earth, and locations subject to saturation with water or other liquids, such as vehicle-washing areas, and locations exposed to weather and unprotected.

(79) **Medium voltage cable.** Type MV medium voltage cable is a single or multiconductor solid dielectric insulated cable rated 2000 volts or higher.

(80) **Metal-clad cable.** Type MC cable is a factory assembly of one or more conductors, each individually insulated and enclosed in a metallic sheath of interlocking tape, or a smooth or corrugated tube.

(81) **Mineral-insulated metal-sheathed cable.** Type MI mineral-insulated metal-sheathed cable is a factory assembly of one or more conductors insulated with a highly compressed refractory mineral insulation and enclosed in a liquidtight and gastight continuous copper sheath.

(82) **Mobile x-ray.** X-ray equipment mounted on a permanent base with wheels and/or casters for moving while completely assembled.

(83) **Nonmetallic-sheathed cable.** Nonmetallic-sheathed cable is a factory assembly of two or more insulated conductors having an outer sheath of moisture resistant, flame-retardant, nonmetallic material. Nonmetallic sheathed cable is manufactured in the following types:

(a) **Type NM.** The overall covering has a flame-retardant and moisture-resistant finish.

(b) **Type NMC.** The overall covering is flame-retardant, moisture-resistant, fungus-resistant, and corrosion-resistant.

(84) **Oil (filled) cutout.** (Over 600 volts, nominal.) A cutout in which all or part of the fuse support and its fuse link or disconnecting blade are mounted in oil with complete immersion of the contacts and the fusible portion of the conducting element (fuse link), so that arc interruption by severing of the fuse link or by opening of the contacts will occur under oil.

(85) **Open wiring on insulators.** Open wiring on insulators is an exposed wiring method using cleats, knobs, tubes, and flexible tubing for the protection and support of single insulated conductors run in or on buildings, and not concealed by the building structure.

(86) **Outlet.** A point on the wiring system at which current is taken to supply utilization equipment.

(87) **Outline lighting.** An arrangement of incandescent lamps or electric discharge tubing to outline or call attention to certain features such as the shape of a building or the decoration of a window.

(88) **Oven, wall-mounted.** An oven for cooking purposes designed for mounting in or on a wall or other surface and consisting of one or more heating elements, internal wiring, and built-in or separately mountable controls. (See "cooking unit, counter-mounted.")

(89) **Overcurrent.** Any current in excess of the rated current of equipment or the ampacity of a conductor. It may result from overload (see definition), short circuit, or ground fault. A current in excess of rating may be accommodated by certain equipment and conductors for a given set of conditions. Hence the rules for overcurrent protection are specific for particular situations.

(90) **Overload.** Operation of equipment in excess of normal, full load rating, or of a conductor in excess of rated ampacity which, when it persists for a sufficient length of time, would cause damage or dangerous overheating. A fault, such as a short circuit or ground fault, is not an overload. (See "overcurrent.")

(91) **Panelboard.** A single panel or group of panel units designed for assembly in the form of a single panel; including buses, automatic overcurrent devices, and with or without switches for the control of light, heat, or power circuits; designed to be placed in a cabinet or cutout box placed in or against a wall or partition and accessible only from the front. (See "switchboard.")

(92) **Permanently installed decorative fountains and reflection pools.** Those that are constructed in the ground, on the ground, or in a building in such a manner that the pool cannot be readily disassembled for storage and are served by electrical circuits of any nature. These units are primarily constructed for their aesthetic value and not intended for swimming or wading.

(93) **Permanently installed swimming pools, wading and therapeutic pools.** Those that are constructed in the ground, on the ground, or in a building in such a manner that the pool cannot be readily disassembled for storage whether or not served by electrical circuits of any nature.

(94) **Portable x-ray.** X-ray equipment designed to be hand-carried.

(95) **Power and control tray cable.** Type TC power and control tray cable is a factory assembly of two or more insulated conductors, with or without associated bare or covered grounding conductors under a nonmetallic sheath, approved for installation in cable trays, in raceways, or where supported by a messenger wire.

(96) **Power fuse.** (Over 600 volts, nominal.) See "fuse."

(97) **Power-limited tray cable.** Type PLTC nonmetallic-sheathed power limited tray cable is a factory assembly of two or more insulated conductors under a nonmetallic jacket.

(98) **Power outlet.** An enclosed assembly which may include receptacles, circuit breakers, fuseholders, fused switches, buses and watt-hour meter mounting means;

intended to supply and control power to mobile homes, recreational vehicles or boats, or to serve as a means for distributing power required to operate mobile or temporarily installed equipment.

(99) **Premises wiring system.** That interior and exterior wiring, including power, lighting, control, and signal circuit wiring together with all of its associated hardware, fittings, and wiring devices, both permanently and temporarily installed, which extends from the load end of the service drop, or load end of the service lateral conductors to the outlet(s). Such wiring does not include wiring internal to appliances, fixtures, motors, controllers, motor control centers, and similar equipment.

(100) **Qualified person.** One familiar with the construction and operation of the equipment and the hazards involved.

(101) **Raceway.** A channel designed expressly for holding wires, cables, or busbars, with additional functions as permitted in this subpart. Raceways may be of metal or insulating material, and the term includes rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquidtight flexible metal conduit, flexible metallic tubing, flexible metal conduit, electrical metallic tubing, underfloor raceways, cellular concrete floor raceways, cellular metal floor raceways, surface raceways, wireways, and busways.

(102) **Readily accessible.** Capable of being reached quickly for operation, renewal, or inspections, without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, chairs, etc. (See "accessible.")

(103) **Receptacle.** A receptacle is a contact device installed at the outlet for the connection of a single attachment plug. A single receptacle is a single contact device with no other contact device on the same yoke. A multiple receptacle is a single device containing two or more receptacles.

(104) **Receptacle outlet.** An outlet where one or more receptacles are installed.

(105) **Remote-control circuit.** Any electric circuit that controls any other circuit through a relay or an equivalent device.

(106) **Sealable equipment.** Equipment enclosed in a case or cabinet that is provided with a means of sealing or locking so that live parts cannot be made accessible without opening the enclosure. The equipment may or may not be operable without opening the enclosure.

(107) **Separately derived system.** A premises wiring system whose power is derived from generator, transformer, or converter winding and has no direct electrical connection, including a solidly connected grounded circuit conductor, to supply conductors originating in another system.

(108) **Service.** The conductors and equipment for delivering energy from the electricity supply system to the wiring system of the premises served.

(109) **Service cable.** Service conductors made up in the form of a cable.

(110) **Service conductors.** The supply conductors that extend from the street main or from transformers to the service equipment of the premises supplied.

(111) **Service drop.** The overhead service conductors from the last pole or other aerial support to and including the splices, if any, connecting to the service-entrance conductors at the building or other structure.

(112) **Service-entrance cable.** Service-entrance cable is a single conductor or multiconductor assembly provided with or without an overall covering, primarily used for services and of the following types:

(a) *Type SE*, having a flame-retardant, moisture-resistant covering, but not required to have inherent protection against mechanical abuse.

(b) *Type USE*, recognized for underground use, having a moisture-resistant covering, but not required to have a flame-retardant covering or inherent protection against mechanical abuse. Single-conductor cables having an insulation specifically approved for the purpose do not require an outer covering.

(113) **Service-entrance conductors, overhead system.** The service conductors between the terminals of the service equipment and a point usually outside the building, clear of building walls, where joined by tap or splice to the service drop.

(114) **Service entrance conductors, underground system.** The service conductors between the terminals of the service equipment and the point of connection to the service lateral. Where service equipment is located outside the building walls, there may be no service-entrance conductors, or they may be entirely outside the building.

(115) **Service equipment.** The necessary equipment, usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the point of entrance of supply conductors to a building or other structure, or an otherwise defined area, and intended to constitute the main control and means of cutoff of the supply.

(116) **Service raceway.** The raceway that encloses the service-entrance conductors.

(117) **Shielded nonmetallic-sheathed cable.** Type SNM, shielded nonmetallic-sheathed cable is a factory assembly of two or more insulated conductors in an extruded core of moisture-resistant, flame-resistant nonmetallic material, covered with an overlapping spiral metal tape and wire shield and jacketed with an extruded moisture-resistant, flame-resistant, oil-resistant, corrosion-resistant, fungus-resistant, and sunlight-resistant nonmetallic material.

(118) **Show window.** Any window used or designed to be used for the display of goods or advertising material, whether it is fully or partly enclosed or entirely open at the rear and whether or not it has a platform raised higher than the street floor level.

(119) **Sign.** See "electric sign."

(120) **Signaling circuit.** Any electric circuit that energizes signaling equipment.

(121) **Special permission.** The written consent of the authority having jurisdiction.

(122) **Storable swimming or wading pool.** A pool with a maximum dimension of fifteen feet and a maximum wall height of three feet and is so constructed that it may be readily disassembled for storage and reassembled to its original integrity.

(123) **Switchboard.** A large single panel, frame, or assembly of panels which have switches, buses, instruments, overcurrent and other protective devices mounted on the face or back or both. Switchboards are generally accessible from the rear as well as from the front and are not intended to be installed in cabinets. (See "panelboard.")

(124) **Switches.**

(a) **General-use switch.** A switch intended for use in general distribution and branch circuits. It is rated in amperes, and it is capable of interrupting its rated current at its rated voltage.

(b) **General-use snap switch.** A form of general-use switch so constructed that it can be installed in flush device boxes or on outlet box covers, or otherwise used in conjunction with wiring systems recognized by this subpart.

(c) **Isolating switch.** A switch intended for isolating an electric circuit from the source of power. It has no interrupting rating, and it is intended to be operated only after the circuit has been opened by some other means.

(d) **Motor-circuit switch.** A switch, rated in horsepower, capable of interrupting the maximum operating overload current of a motor of the same horsepower rating as the switch at the rated voltage.

(125) **Switching devices.** (Over 600 volts, nominal.) Devices designed to close and/or open one or more electric circuits. Included in this category are circuit breakers, cutouts, disconnecting (or isolating) switches, disconnecting means, interrupter switches, and oil (filled) cutouts.

(126) **Transportable x-ray.** X-ray equipment installed in a vehicle or that may readily be disassembled for transport in a vehicle.

(127) **Utilization equipment.** Utilization equipment means equipment which utilizes electric energy for mechanical, chemical, heating, lighting, or similar useful purpose.

(128) **Utilization system.** A utilization system is a system which provides electric power and light for employee workplaces, and includes the premises wiring system and utilization equipment.

(129) **Ventilated.** Provided with a means to permit circulation of air sufficient to remove an excess of heat, fumes, or vapors.

(130) **Volatile flammable liquid.** A flammable liquid having a flash point below 38 degrees C (100 degrees F) or whose temperature is above its flash point.

(131) **Voltage (of a circuit).** The greatest root-mean-square (effective) difference of potential between any two conductors of the circuit concerned.

(132) **Voltage, nominal.** A nominal value assigned to a circuit or system for the purpose of conveniently designating its voltage class (as 120/240, 480Y/277, 600, etc.). The actual voltage at which a circuit operates can vary from the nominal within a range that permits satisfactory operation of equipment.

(133) **Voltage to ground.** For grounded circuits, the voltage between the given conductor and that point or

conductor of the circuit that is grounded; for ungrounded circuits, the greatest voltage between the given conductor and any other conductor of the circuit.

(134) **Watertight.** So constructed that moisture will not enter the enclosure.

(135) **Weatherproof.** So constructed or protected that exposure to the weather will not interfere with successful operation. Rainproof, raintight, or watertight equipment can fulfill the requirements for weatherproof where varying weather conditions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

(136) **Wet location.** See "location."

(137) **Wireways.** Wireways are sheet-metal troughs with hinged or removable covers for housing and protecting electric wires and cable and in which conductors are laid in place after the wireway has been installed as a complete system.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-24-95601, filed 11/14/88; 87-24-051 (Order 87-24), § 296-24-95601, filed 11/30/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 82-08-026 (Order 82-10), § 296-24-95601, filed 3/30/82.]

WAC 296-24-95603 Electric utilization systems.

(1) **Scope.**

(a) **Covered.** The provisions of WAC 296-24-95603 through 296-24-95617 cover electrical installations and utilization equipment installed or used within or on buildings, structures, and other premises including:

- (i) Yards;
- (ii) Carnivals;
- (iii) Parking and other lots;
- (iv) Mobile homes;
- (v) Recreational vehicles;

(vi) Industrial substations under 750 volts. Chapter 296-44 WAC, Safety standards—Electrical Construction Code, shall apply to industrial substations of 750 volts or more;

(vii) Conductors that connect the installations to a supply of electricity; and

(viii) Other outside conductors on the premises.

(b) **Not covered.** The provisions of WAC 296-24-95603 through 296-24-95617 do not cover:

(i) Installations in ships, watercraft, railway rolling stock, aircraft, or automotive vehicles other than mobile homes and recreational vehicles.

(ii) Installations underground in mines.

(iii) Installations of railways for generation, transformation, transmission, or distribution of power used exclusively for operation of rolling stock or installations used exclusively for signaling and communication purposes.

(iv) Installations of communication equipment under the exclusive control of communication utilities, located outdoors or in building spaces used exclusively for such installations.

(v) Installations under the exclusive control of electric utilities for the purpose of communication or metering; or for the generation, control, transformation, transmission, and distribution of electric energy located in buildings used exclusively by utilities for such purposes or

located outdoors on property owned or leased by the utility or on public highways, streets, roads, etc., or outdoors by established rights on private property.

(2) **Extent of application.**

(a) The requirements contained in the sections listed below shall apply to all electrical installations and utilization equipment, regardless of when they were designed or installed:

Sections:

WAC 296-24-95605(2) _____	Examination, installation, and use of equipment.
" " (3) _____	Splices.
" " (4) _____	Arcing parts.
" " (5) _____	Marking.
" " (6) _____	Identification of disconnecting means.
" " (7)(b) _____	Guarding of live parts.
WAC 296-24-95607 (5)(a)(i) _____	Protection of conductors and equipment.
" " (5)(a)(iv) _____	Location in or on premises.
" " (5)(a)(v) _____	Arcing or suddenly moving parts.
" " (6)(a)(ii) _____	2-Wire DC systems to be grounded.
" " (6)(a)(iii) and (iv) _____	AC systems to be grounded.
" " (6)(a)(v) _____	AC systems 50 to 1000 volts not required to be grounded.
" " (6)(c) _____	Grounding connections.
" " (6)(d) _____	Grounding path.
WAC 296-24-95607 (6)(e)(iv)(A) through (D) _____	Fixed equipment required to be grounded.
" " (6)(e)(v) _____	Grounding of equipment connected by cord and plug.
" " (6)(e)(vi) _____	Grounding of nonelectrical equipment.
" " (6)(f)(i) _____	Methods of grounding fixed equipment.
WAC 296-24-95609 (7)(a)(i) and (ii) _____	Flexible cords and cables, uses.
" " (7)(a)(iii) _____	Flexible cords and cables prohibited.
" " (7)(b)(ii) _____	Flexible cords and cables, splices.
" " (7)(b)(iii) _____	Pull at joints and terminals of flexible cords and cables.
WAC 296-24-95613 _____	Hazardous (classified) locations.

(b) Every electric utilization system and all utilization equipment installed after March 15, 1972, and every major replacement, modification, repair, or rehabilitation, after March 15, 1972, of any part of any electric utilization system or utilization equipment installed before March 15, 1972, shall comply with the provisions of WAC 296-24-956 through 296-24-95617.

Note: "Major replacements, modifications, repairs, or rehabilitations" include work similar to that involved when a new building or facility is built, a new wing is added, or an entire floor is renovated.

(c) The following provisions apply to electric utilization systems and utilization equipment installed after April 16, 1981:

WAC 296-24-95605 (8)(d)(i) and (ii) _____	Entrance and access to work space (over 600 volts).
WAC 296-24-95607 (5)(a)(vi)(B) _____	Circuit breakers operated vertically.
" " (5)(a)(vi)(C) _____	Circuit breakers used as switches.
" " (6)(g)(ii) _____	Grounding of systems of 1000 volts or more supplying portable or mobile equipment.
WAC 296-24-95609 (10)(f)(ii)(B) _____	Switching series capacitors over 600 volts.
WAC 296-24-95611 (3)(b) _____	Warning signs for elevators and escalators.
" " (9) _____	Electrically controlled irrigation machines.
" " (10)(e) _____	Ground-fault circuit interrupters for fountains.
WAC 296-24-95615 (1)(a)(ii) _____	Physical protection of conductors over 600 volts.
" " (3)(b) _____	Marking of Class 2 and Class 3 power supplies.
" " (4) _____	Fire protective signaling circuits.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-24-95603, filed 11/30/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 82-08-026 (Order 82-10), § 296-24-95603, filed 3/30/82.]

WAC 296-24-95605 General requirements. (1) **Approval.** The conductors and equipment required or permitted by this section shall be acceptable only if approved.

(2) **Examination, installation, and use of equipment.**

(a) **Examination.** Electrical equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined using the following considerations:

(i) Suitability for installation and use in conformity with the provisions of this subpart. Suitability of equipment for an identified purpose may be evidenced by listing or labeling for that identified purpose.

(ii) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided.

(iii) Electrical insulation.

(iv) Heating effects under conditions of use.

(v) Arcing effects.

(vi) Classification by type, size, voltage, current capacity, specific use.

(vii) Other factors which contribute to the practical safeguarding of employees using or likely to come in contact with the equipment.

(b) **Installation and use.** Listed or labeled equipment shall be used or installed in accordance with any instructions included in the listing or labeling.

(3) **Splices.** Conductors shall 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 shall first be so spliced or joined as to be mechanically and electrically secure without solder and then soldered. All splices and joints and the free ends of conductors shall be covered with an insulation equivalent

to that of the conductors or with an insulating device suitable for the purpose.

(4) **Arcing parts.** Parts of electric equipment which in ordinary operation produce arcs, sparks, flames, or molten metal shall be enclosed or separated and isolated from all combustible material.

(5) **Marking.** Electrical equipment may not be used unless the manufacturer's name, trademark, or other descriptive marking by which the organization responsible for the product may be identified is placed on the equipment. Other markings shall be provided giving voltage, current, wattage, or other ratings as necessary. The marking shall be of sufficient durability to withstand the environment involved.

(6) **Identification of disconnecting means and circuits.** Each disconnecting means required by this subpart for motors and appliances shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

(7) **600 volts, nominal, or less.**

(a) **Working space about electric equipment.** Sufficient access and working space shall be provided and maintained about all electric equipment to permit ready and safe operation and maintenance of such equipment.

(i) **Working clearances.** Except as required or permitted elsewhere in this chapter, 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 may not be less than indicated in Table S-1. In addition to the dimensions shown in Table S-1, workspace may not be less than 30 inches wide in front of the electric equipment. Distances shall be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. Concrete, brick, or tile walls are considered to be grounded. Working space is not required in back of assemblies such as dead-front switchboards or motor control centers where there are no renewable or adjustable parts such as fuses or switches on the back and where all connections are accessible from locations other than the back.

TABLE S-1—Working clearances

Nominal voltage to ground	Minimum clear distance for condition ² (ft)		
	(a)	(b)	(c)
0-150	1/3	1/3	3
151-600	1/3	3 1/2	4

¹Minimum clear distances may be 2 feet 6 inches for installations built prior to effective date of this section.

²Conditions (a), (b), (c), are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working

space, or exposed live parts on both sides effectively guarded by suitable wood or other insulating material. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts.
 (b) Exposed live parts on one side and grounded parts on the other side
 (c) Exposed live parts on both sides of the workspace (not guarded as provided in condition (a)) with the operator between.

(ii) **Clear spaces.** Working space required by this subpart may not be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, shall be suitably guarded.

(iii) **Access and entrance to working space.** At least one entrance of sufficient area shall be provided to give access to the working space about electric equipment.

(iv) **Front working space.** Where there are live parts normally exposed on the front of switchboards or motor control centers, the working space in front of such equipment may not be less than 3 feet.

(v) **Illumination.** Illumination shall be provided for all working spaces about service equipment, switchboards, panelboards, and motor control centers installed indoors.

(vi) **Headroom.** The minimum headroom of working spaces about service equipment, switchboards, panelboards, or motor control centers shall be 6 feet 3 inches.

Note: As used in this section, a motor control center is an assembly of one or more enclosed sections having a common power bus and principally containing motor control units.

(b) **Guarding of live parts.**

(i) Except as required or permitted elsewhere in this section, live parts of electric equipment operating at 50 volts or more shall be guarded against accidental contact by approved cabinets or other forms of approved enclosures, or by any of the following means:

(A) By location in a room, vault, or similar enclosure that is accessible only to qualified persons.

(B) By suitable permanent, substantial partitions or screens so arranged that only qualified persons will have access to the space within reach of the live parts. Any openings in such partitions or screens shall be so sized and located that persons are not likely to come into accidental contact with live parts or to bring conducting objects into contact with them.

(C) By location on a suitable balcony, gallery, or platform so elevated and arranged as to exclude unqualified persons.

(D) By elevation of 8 feet or more above the floor or other working surface.

(ii) In locations where electric equipment would be exposed to physical damage, enclosures or guards shall be so arranged and of such strength as to prevent such damage.

(iii) Entrances to rooms and other guarded locations containing exposed live parts shall be marked with conspicuous warning signs forbidding unqualified persons to enter.

(8) **Over 600 volts, nominal.**

(a) **General.** Conductors and equipment used on circuits exceeding 600 volts, nominal, shall comply with all applicable provisions of subsections (1) through (7) of this section and with the following provisions which supplement or modify those requirements. The provisions of

(b), (c) and (d) of this subsection do not apply to equipment on the supply side of the service conductors.

(b) **Enclosure for electrical installations.** Electrical installations in a vault, room, closet or in an area surrounded by a wall, screen, or fence, access to which is controlled by lock and key or other approved means, are considered to be accessible to qualified persons only. A wall, screen, or fence less than 8 feet in height 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, shall be kept locked or shall be under the observation of a qualified person at all times.

(i) **Installations accessible to qualified persons only.** Electrical installations having exposed live parts shall be accessible to qualified persons only and shall comply with the applicable provisions of (c) of this subsection.

(ii) **Installations accessible to unqualified persons.** Electrical installations that are open to unqualified persons shall be made with metal-enclosed equipment or shall be enclosed in a vault or in an area, access to which is controlled by a lock. 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 shall be kept locked. Metal-enclosed switchgear, unit substations, transformers, pull boxes, connection boxes, and other similar associated equipment shall be marked with appropriate caution signs. If equipment is exposed to physical damage from vehicular traffic, suitable guards shall be provided to prevent such damage. Ventilating or similar openings in metal-enclosed equipment shall be designed so that foreign objects inserted through these openings will be deflected from energized parts.

(c) **Workspace about equipment.** Sufficient space shall be provided and maintained about electric equipment to permit ready and safe operation and maintenance of such equipment. Where energized parts are exposed, the minimum clear workspace may not be less than 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 shall be as required in Table S-2. The workspace shall be adequate to permit at least a 90-degree opening of doors or hinged panels.

(i) **Working space.** The minimum clear working space in front of electric equipment such as switchboards, control panels, switches, circuit breakers, motor controllers, relays, and similar equipment may not be less than specified in Table S-2 unless otherwise specified in this subpart. Distances shall be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. However, working space is not required in back of equipment such as deadfront switchboards or control assemblies where there are no renewable or adjustable parts (such as fuses or switches) on the back and where all connections are accessible from locations other than the back. Where rear access is required to work on deenergized parts on the back of enclosed equipment, a minimum working space of 30 inches horizontally shall be provided.

TABLE S-2—Minimum Depth of Clear Working Space in Front of Electric Equipment

Nominal voltage to ground	Conditions ² (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 75kV ¹	6	8	10
Above 75kV ¹	8	10	12

¹Minimum 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. (2) Conditions (a), (b) and (c) are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by suitable wood or other insulating materials. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side. Concrete, brick, or tile walls will be considered as grounded surfaces. (c) Exposed live parts on both sides of the workspace not guarded as provided in condition (a) with the operator between.

(ii) **Illumination.** Adequate illumination shall be provided for all working spaces about electric equipment. The lighting outlets shall be so arranged that persons changing lamps or making repairs on the lighting system will not be endangered by live parts or other equipment. The points of control shall be so located that persons are not likely to come in contact with any live part or moving part of the equipment while turning on the lights.

(iii) **Elevation of unguarded live parts.** Unguarded live parts above working space shall be maintained at elevations not less than specified in Table S-3.

TABLE S-3—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 0 inches for installations built prior to April 16, 1981, if the nominal voltage between phases is in the range of 601-6600 volts.

(d) **Entrance and access to workspace.** (See WAC 296-24-95603 (2)(c).)

(i) At least one entrance not less than 24 inches wide and 6 feet 6 inches high shall be provided to give access to the working space about electric equipment. On switchboard and control panels exceeding 48 inches in width, there shall be one entrance at each end of such board where practicable. Where bare energized parts at any voltage or insulated energized parts above 600 volts are located adjacent to such entrance, they shall be suitably guarded.

(ii) Permanent ladders or stairways shall be provided to give safe access to the working space around electric equipment installed on platforms, balconies, mezzanine floors, or in attic or roof rooms or spaces.

[Statutory Authority: Chapter 49.17 RCW, 87-24-051 (Order 87-24), § 296-24-95605, filed 11/30/87. Statutory Authority: RCW 49.17.040 and 49.17.050, 82-08-026 (Order 82-10), § 296-24-95605, filed 3/30/82.]

WAC 296-24-95607 Wiring design and protection.

(1) Use and identification of grounded and grounding conductors.

(a) **Identification of conductors.** A conductor used as a grounded conductor shall be identifiable and distinguishable from all other conductors. A conductor used as an equipment grounding conductor shall be identifiable and distinguishable from all other conductors.

(b) **Polarity of connections.** No grounded conductor may be attached to any terminal or lead so as to reverse designated polarity.

(c) **Use of grounding terminals and devices.** A grounding terminal or grounding-type device on a receptacle, cord connector, or attachment plug may not be used for purposes other than grounding.

(2) Branch circuits.

(a) **Ground-fault protection for personnel on construction sites.** The employer shall use either ground-fault circuit interrupters as specified in item (a)(i) of this subsection or an assured equipment grounding conductor program as specified in item (a)(ii) of this subsection, to protect employees on construction sites. These requirements are in addition to any other requirements for equipment grounding conductors.

(i) **Ground-fault circuit interrupters.** All 120-volt, single-phase, 15-ampere and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and which are in use by employees, shall have approved ground-fault circuit interrupters for personnel protection. Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5 kW, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with ground-fault circuit interrupters.

(ii) **Assured equipment grounding conductor program.** The employer shall establish and implement an assured equipment grounding conductor program on construction sites covering all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and equipment connected by cord and plug, which are available for use or used by employees. This program shall comply with the following minimum requirements:

(A) A written description of the program, including the specific procedures adopted by the employer, shall be available at the jobsite for inspection and copying by the director and any affected employee.

(B) The employer shall designate one or more competent persons (as defined in WAC 296-24-012) to implement the program.

(C) Each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected before each day's use for external defects, such as deformed or missing pins or insulation damage, and for indication of possible internal damage. Equipment

found damaged or defective may not be used until repaired.

(D) The following tests shall be performed on all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and cord-connected and plug-connected equipment required to be grounded:

(I) All equipment grounding conductors shall be tested for continuity and shall be electrically continuous.

(II) Each receptacle and attachment cap or plug shall be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor shall be connected to its proper terminal.

(E) All required tests shall be performed:

(I) Before first use;

(II) Before equipment is returned to service following any repairs;

(III) Before equipment is used after any incident which can be reasonably suspected to have caused damage (for example, when a cord set is run over); and

(IV) At intervals not to exceed 3 months, except that cord sets and receptacles which are fixed and not exposed to damage shall be tested at intervals not exceeding 6 months.

(F) The employer may not make available or permit the use by employees of any equipment which has not met the requirements of this item (a)(ii) of this subsection.

(G) Tests performed as required in this section shall be recorded. This test record shall identify each receptacle, cord set, and cord-connected and plug-connected equipment that passed the test, and shall indicate the last date it was tested or the interval for which it was tested. This record shall be kept by means of logs, color coding, or other effective means, and shall be maintained until replaced by a more current record. The record shall be made available on the jobsite for inspection by the director and any affected employee.

(b) **Outlet devices.** Outlet devices shall have an ampere rating not less than the load to be served.

(3) **Outside conductors, 600 volts, nominal, or less.** Subdivisions (a), (b), (c) and (d) of this subsection apply to branch circuit, feeder, and service conductors rated 600 volts, nominal, or less and run outdoors as open conductors. Subdivision (e) of this subsection applies to lamps installed under such conductors.

(a) **Conductors on poles.** Conductors supported on poles shall provide a horizontal climbing space not less than the following:

(i) Power conductors below communication conductors—30 inches.

(ii) Power conductors alone or above communication conductors: 300 volts or less—24 inches; more than 300 volts—30 inches.

(iii) Communication conductors below power conductors with power conductors 300 volts or less—24 inches; more than 300 volts—30 inches.

(b) **Clearance from ground.** Open conductors shall conform to the following minimum clearances:

(i) 10 feet—above finished grade, sidewalks, or from any platform or projection from which they might be reached.

(ii) 12 feet—over areas subject to vehicular traffic other than truck traffic.

(iii) 15 feet—over areas other than those specified in item (b)(iv) of this subsection that are subject to truck traffic.

(iv) 18 feet—over public streets, alleys, roads, and driveways.

(c) **Clearance from building openings.** Conductors shall 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.

(d) **Clearance over roofs.** Conductors shall have a clearance of not less than 8 feet from the highest point of roofs over which they pass, except that:

(i) Where the voltage between conductors is 300 volts or less and the roof has a slope of not less than 4 inches in 12, the clearance from the roofs shall be at least 3 feet; or

(ii) Where the voltage between conductors is 300 volts or less and 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 shall be at least 18 inches.

(e) **Location of outdoor lamps.** Lamps for outdoor lighting shall be located below all live conductors, transformers, or other electric equipment, unless such equipment is controlled by a disconnecting means that can be locked in the open position or unless adequate clearances or other safeguards are provided for relamping operations.

(4) Services.

(a) Disconnecting means.

(i) **General.** Means shall be provided to disconnect all conductors in a building or other structure from the service-entrance conductors. The disconnecting means shall plainly indicate whether it is in the open or closed position and shall be installed at a readily accessible location nearest the point of entrance of the service-entrance conductors.

(ii) **Simultaneous opening of poles.** Each service disconnecting means shall simultaneously disconnect all ungrounded conductors.

(b) **Services over 600 volts, nominal.** The following additional requirements apply to services over 600 volts, nominal.

(i) **Guarding.** Service-entrance conductors installed as open wires shall be guarded to make them accessible only to qualified persons.

(ii) **Warning signs.** Signs warning of high voltage shall be posted where other than qualified employees might come in contact with live parts.

(5) Overcurrent protection.

(a) **600 volts, nominal, or less.** The following requirements apply to overcurrent protection of circuits rated 600 volts, nominal, or less.

(i) **Protection of conductors and equipment.** Conductors and equipment shall be protected from overcurrent in accordance with their ability to safely conduct current.

(ii) **Grounded conductors.** Except for motor running overload protection, overcurrent devices may not interrupt the continuity of the grounded conductor unless all conductors of the circuit are opened simultaneously.

(iii) **Disconnection of fuses and thermal cutouts.** Except for service fuses, all cartridge fuses which are accessible to other than qualified persons and all fuses and thermal cutouts on circuits over 150 volts to ground shall be provided with disconnecting means. This disconnecting means shall be installed so that the fuse or thermal cutout can be disconnected from its supply without disrupting service to equipment and circuits unrelated to those protected by the overcurrent device.

(iv) **Location in or on premises.** Overcurrent devices shall be readily accessible to each employee or authorized building management personnel. These overcurrent devices may not be located where they will be exposed to physical damage nor in the vicinity of easily ignitable material.

(v) **Arcing or suddenly moving parts.** Fuses and circuit breakers shall be so located or shielded that employees will not be burned or otherwise injured by their operation.

(vi) Circuit breakers.

(A) Circuit breakers shall clearly indicate whether they are in the open (off) or closed (on) position.

(B) Where circuit breaker handles on switchboards are operated vertically rather than horizontally or rotationally, the up position of the handle shall be the closed (on) position. (See WAC 296-24-95603 (2)(c).)

(C) If used as switches in 120-volt, fluorescent lighting circuits, circuit breakers shall be approved for the purpose and marked "SWD." (See WAC 296-24-95603 (2)(c).)

(b) **Over 600 volts, nominal.** Feeders and branch circuits over 600 volts, nominal, shall have short-circuit protection.

(6) **Grounding.** Subdivisions (a) through (g) of this subsection contain grounding requirements for systems, circuits, and equipment.

(a) **Systems to be grounded.** The following systems which supply premises wiring shall be grounded:

(i) All 3-wire DC systems shall have their neutral conductor grounded.

(ii) Two-wire DC systems operating at over 50 volts through 300 volts between conductors shall be grounded unless:

(A) They supply only industrial equipment in limited areas and are equipped with a ground detector; or

(B) They are rectifier-derived from an AC system complying with items (a)(iii), (a)(iv), and (a)(v) of this subsection; or

(C) They are fire-protective signaling circuits having a maximum current of 0.030 amperes.

(iii) AC circuits of less than 50 volts shall be grounded if they are installed as overhead conductors outside of buildings or if they are supplied by transformers and the transformer primary supply system is ungrounded or exceeds 150 volts to ground.

(iv) AC systems of 50 volts to 1000 volts shall be grounded under any of the following conditions, unless exempted by item (a)(v) of this subsection:

(A) If the system can be so grounded that the maximum voltage to ground on the ungrounded conductors does not exceed 150 volts;

(B) If the system is nominally rated 480Y/277 volt, 3-phase, 4-wire in which the neutral is used as a circuit conductor;

(C) If the system is nominally rated 240/120 volt, 3-phase, 4-wire in which the midpoint of one phase is used as a circuit conductor; or

(D) If a service conductor is uninsulated.

(v) AC systems of 50 volts to 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, provided all of the following conditions are met:

(I) The system is used exclusively for control circuits;

(II) The conditions of maintenance and supervision assure 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.

(D) If the system is an isolated power system that supplies circuits in health care facilities.

(b) **Conductors to be grounded.** For AC premises wiring systems the identified conductor shall be grounded.

(c) **Grounding connections.**

(i) For a grounded system, a grounding electrode conductor shall be used to connect both the equipment grounding conductor and the grounded circuit conductor to the grounding electrode. Both the equipment grounding conductor and the grounding electrode conductor shall be connected to the grounded circuit conductor on the supply side of the service disconnecting means, or on the supply side of the system disconnecting means or overcurrent devices if the system is separately derived.

(ii) For an ungrounded service-supplied system, the equipment grounding conductor shall be connected to the grounding electrode conductor at the service equipment. For an ungrounded separately derived system, the equipment grounding conductor shall be connected to the grounding electrode conductor at, or ahead of, the system disconnecting means or overcurrent devices.

(iii) On extensions of existing branch circuits which do not have an equipment grounding conductor, ground-type receptacles may be grounded to a grounded cold water pipe near the equipment.

(d) **Grounding path.** The path to ground from circuits, equipment, and enclosures shall be permanent and continuous.

(e) **Supports, enclosures, and equipment to be grounded.**

(i) **Supports and enclosures for conductors.** Metal cable trays, metal raceways, and metal enclosures for conductors shall be grounded, except that:

(A) Metal enclosures such as sleeves that are used to protect cable assemblies from physical damage need not be grounded; or

(B) Metal enclosures for conductors added to existing installations of open wire, knob-and-tube wiring, and nonmetallic-sheathed cable need not be grounded if all of the following conditions are met:

(I) Runs are less than 25 feet;

(II) Enclosures are free from probable contact with ground, grounded metal, metal laths, or other conductive materials; and

(III) Enclosures are guarded against employee contact.

(ii) **Service equipment enclosures.** Metal enclosures for service equipment shall be grounded.

(iii) **Frames of ranges and clothes dryers.** Frames of electric ranges, wall-mounted ovens, counter-mounted cooking units, clothes dryers, and metal outlet or junction boxes which are part of the circuit for these appliances shall be grounded.

(iv) **Fixed equipment.** Exposed noncurrent-carrying metal parts of fixed equipment which may become energized shall be grounded under any of the following conditions:

(A) If within 8 feet 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 which are permanently and effectively insulated from ground; and

(III) The cases of distribution apparatus such as transformers and capacitors mounted on wooden poles at a height exceeding 8 feet above ground or grade level.

(v) **Equipment connected by cord and plug.** Under any of the conditions described in subitems (e)(v)(A) through (e)(v)(C) of this subsection, exposed noncurrent-carrying metal parts of cord-connected and plug-connected equipment which may become energized shall be grounded.

(A) If in hazardous (classified) locations (see WAC 296-24-95613).

(B) If operated at over 150 volts to ground, except for guarded motors and metal frames of electrically heated

appliances if the appliance frames are permanently and effectively insulated from ground.

(C) If the equipment is of the following types:

(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) Motor-operated appliances of the following types: 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) Portable and mobile x-ray and associated equipment;

(VII) Tools likely to be used in wet and conductive locations; and

(VIII) 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 not over 50 volts. Listed or labeled portable tools and appliances protected by an approved system of double insulation, or its equivalent, need not be grounded. If such a system is employed, the equipment shall be distinctively marked to indicate that the tool or appliance utilizes an approved system of double insulation.

(vi) **Nonelectrical equipment.** The metal parts of the following nonelectrical equipment shall be grounded: Frames and tracks of electrically operated cranes; frames of nonelectrically driven elevator cars to which electric conductors are attached; hand operated metal shifting ropes or cables of electric elevators, and metal partitions, grill work, and similar metal enclosures around equipment of over 750 volts between conductors.

(f) **Methods of grounding fixed equipment.**

(i) Noncurrent-carrying metal parts of fixed equipment, if required to be grounded by this section, shall be grounded by an equipment grounding conductor which is contained within the same raceway, cable, or cord, or runs with or encloses the circuit conductors. For DC circuits only, the equipment grounding conductor may be run separately from the circuit conductors.

(ii) Electric equipment is considered to be effectively grounded if it is secured to, and in electrical contact with, a metal rack or structure that is provided for its support and the metal rack or structure is grounded by the method specified for the noncurrent-carrying metal parts of fixed equipment in item (f)(i) of this subsection. For installations made before May 30, 1982, only, electric equipment is also considered to be effectively 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 to be effectively grounded.

(g) **Grounding of systems and circuits of 1000 volts and over (high voltage).**

(i) **General.** If high voltage systems are grounded, they shall comply with all applicable provisions of subdivisions (a) through (f) of this subsection as supplemented and modified by the subdivision (g) of this subsection.

(ii) **Grounding of systems supplying portable or mobile equipment.** (See WAC 296-24-95603 (2)(c).) Systems supplying portable or mobile high voltage equipment, other than substations installed on a temporary basis, shall comply with the following:

(A) Portable and mobile high voltage equipment shall be supplied from a system having its neutral grounded through an impedance. If a delta-connected high voltage system is used to supply the equipment, a system neutral shall be derived.

(B) Exposed noncurrent-carrying metal parts of portable and mobile equipment shall be connected by an equipment grounding conductor to the point at which the system neutral impedance is grounded.

(C) Ground-fault detection and relaying shall be provided to automatically deenergize any high voltage system component which has developed a ground fault. The continuity of the equipment grounding conductor shall be continuously monitored so as to deenergize automatically the high voltage feeder to the portable equipment upon loss of continuity of the equipment grounding conductor.

(D) The grounding electrode to which the portable or mobile equipment system neutral impedance is connected shall be isolated from and separated in the ground by at least 20 feet from any other system or equipment grounding electrode, and there shall be no direct connection between the grounding electrodes, such as buried pipe, fence, etc.

(iii) **Grounding of equipment.** All noncurrent-carrying metal parts of portable equipment and fixed equipment including their associated fences, housings, enclosures, and supporting structures shall be grounded. However, equipment which is guarded by location and isolated from ground need not be grounded. Additionally, pole-mounted distribution apparatus at a height exceeding 8 feet above ground or grade level need not be grounded.

[Statutory Authority: Chapter 49.17 RCW, 87-24-051 (Order 87-24), § 296-24-95607, filed 11/30/87. Statutory Authority: RCW 49.17.040 and 49.17.050, 82-08-026 (Order 82-10), § 296-24-95607, filed 3/30/82.]

WAC 296-24-95609 Wiring methods, components, and equipment for general use. (1) **Wiring methods.** The provisions of this section do not apply to the conductors that are an integral part of factory-assembled equipment.

(a) **General requirements.**

(i) **Electrical continuity of metal raceways and enclosures.** Metal raceways, cable armor, and other metal enclosures for conductors shall be metallically joined together into a continuous electric conductor and shall be so connected to all boxes, fittings, and cabinets as to provide effective electrical continuity.

(ii) **Wiring in ducts.** No wiring systems of any type shall be installed in ducts used to transport dust, loose stock or flammable vapors. No wiring system of any

type may be installed in any duct used for vapor removal or for ventilation of commercial-type cooking equipment, or in any shaft containing only such ducts.

(b) **Temporary wiring.** Temporary electrical power and lighting wiring methods may be of a class less than would be required for a permanent installation. Except as specifically modified in this paragraph, all other requirements of this subpart for permanent wiring shall apply to temporary wiring installations.

(i) **Uses permitted, 600 volts, nominal or less.** Temporary electrical power and lighting installations 600 volts, nominal, or less may be used only:

(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 period not to exceed 90 days for Christmas decorative lighting, carnivals, and similar purposes.

(ii) **Uses permitted, over 600 volts, nominal.** Temporary wiring over 600 volts, nominal, may be used only during periods of tests, experiments, or emergencies.

(iii) **General requirements for temporary wiring.**

(A) Feeders shall originate in an approved distribution center. The conductors shall 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.

(B) Branch circuits shall originate in an approved power outlet or panelboard. Conductors shall be multiconductor cord or cable assemblies or open conductors. If run as open conductors they shall be fastened at ceiling height every 10 feet. No branch-circuit conductor may be laid on the floor. Each branch circuit that supplies receptacles or fixed equipment shall contain a separate equipment grounding conductor if run as open conductors.

(C) Receptacles shall be of the grounding type. Unless installed in a complete metallic raceway, each branch circuit shall contain a separate equipment grounding conductor and all receptacles shall be electrically connected to the grounding conductor.

(D) No bare conductors nor earth returns may be used for the wiring of any temporary circuit.

(E) Suitable disconnecting switches or plug connectors shall be installed to permit the disconnection of all ungrounded conductors of each temporary circuit.

(F) Lamps for general illumination shall be protected from accidental contact or breakage. Protection shall be provided by elevation of at least 7 feet from normal working surface or by a suitable fixture or lampholder with a guard.

(G) Flexible cords and cables shall be protected from accidental damage. Sharp corners and projections shall be avoided. Where passing through doorways or other pinch points, flexible cords and cables shall be provided with protection to avoid damage.

(c) **Cable trays.**

(i) **Uses permitted.**

(A) Only the following may be installed in cable tray systems:

(I) Mineral-insulated metal-sheathed cable (Type MI);

(II) Armored cable (Type AC);

(III) Metal-clad cable (Type MC);

(IV) Power-limited tray cable (Type PLTC);

(V) Nonmetallic-sheathed cable (Type NM or NMC);

(VI) Shielded nonmetallic-sheathed cable (Type SNM);

(VII) Multiconductor service-entrance cable (Type SE or USE);

(VIII) Multiconductor underground feeder and branch-circuit cable (Type UF);

(IX) Power and control tray cable (Type TC);

(X) Other factory-assembled, multiconductor control, signal, or power cables which are specifically approved for installation in cable trays; or

(XI) Any approved conduit or raceway with its contained conductors.

(B) In industrial establishments only, where conditions of maintenance and supervision assure 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:

(I) Single conductor cables which 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 shall be sunlight-resistant.

(II) Type MV cables, where exposed to direct rays of the sun, shall be sunlight-resistant.

(C) Cable trays in hazardous (classified) locations shall contain only the cable types permitted in such locations.

(ii) **Uses not permitted.** Cable tray systems may not be used in hoistways or where subjected to severe physical damage.

(d) **Open wiring on insulators.**

(i) **Uses permitted.** Open wiring on insulators is only permitted on systems of 600 volts, nominal, or less for industrial or agricultural establishments and for services.

(ii) **Conductor supports.** Conductors shall be rigidly supported on noncombustible, nonabsorbent insulating materials and may not contact any other objects.

(iii) **Flexible nonmetallic tubing.** In dry locations where not exposed to severe physical damage, conductors may be separately enclosed in flexible nonmetallic tubing. The tubing shall be in continuous lengths not exceeding 15 feet and secured to the surface by straps at intervals not exceeding 4 feet 6 inches.

(iv) **Through walls, floors, wood cross members, etc.** Open conductors shall 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 shall be inserted in the hole and an insulating bushing slipped into the sleeve at each end in such a manner as to keep the conductors absolutely

out of contact with the sleeve. Each conductor shall be carried through a separate tube or sleeve.

(v) **Protection from physical damage.** Conductors within 7 feet from the floor are considered exposed to physical damage. Where open conductors cross ceiling joints and wall studs and are exposed to physical damage, they shall be protected.

(2) **Cabinets, boxes, and fittings.**

(a) **Conductors entering boxes, cabinets, or fittings.** Conductors entering boxes, cabinets, or fittings shall be protected from abrasion, and openings through which conductors enter shall be effectively closed. Unused openings in cabinets, boxes, and fittings shall also be effectively closed.

(b) **Covers and canopies.** All pull boxes, junction boxes, and fittings shall be provided with covers approved for the purpose. If metal covers are used they shall be grounded. In completed installations each outlet box shall have a cover, faceplate, or fixture canopy. Covers of outlet boxes having holes through which flexible cord pendants pass shall be provided with bushings designed for the purpose or shall have smooth, well-rounded surfaces on which the cords may bear.

(c) **Pull and junction boxes for systems over 600 volts, nominal.** In addition to other requirements in this section for pull and junction boxes, the following shall apply to these boxes for systems over 600 volts, nominal:

(i) Boxes shall provide a complete enclosure for the contained conductors or cables.

(ii) Boxes shall be closed by suitable covers securely fastened in place. Underground box covers that weight over 100 pounds meet this requirement. Covers for boxes shall be permanently marked "HIGH VOLTAGE." The marking shall be on the outside of the box cover and shall be readily visible and legible.

(3) **Switches.**

(a) **Knife switches.** Single-throw knife switches shall be so connected that the blades are dead when the switch is in the open position. Single-throw knife switches shall be so placed that gravity will not tend to close them. Single-throw knife switches approved for use in the inverted position shall be provided with a locking device that will ensure that the blades remain in the open position when so set. Double-throw knife switches may be mounted so that the throw will be either vertical or horizontal. However, if the throw is vertical a locking device shall be provided to ensure that the blades remain in the open position when so set.

(b) **Faceplates for flush-mounted snap switches.** Flush snap switches that are mounted in ungrounded metal boxes and located within reach of conducting floors or other conducting surfaces shall be provided with faceplates of nonconducting, noncombustible material.

(4) **Switchboards and panelboards.** Switchboards that have any exposed live parts shall be located in permanently dry locations and accessible only to qualified persons. Panelboards shall be mounted in cabinets, cutout boxes, or enclosures approved for the purpose and shall be dead front. However, panelboards other than the dead front externally-operable type are permitted where

accessible only to qualified persons. Exposed blades of knife switches shall be dead when open.

(5) **Enclosures for damp or wet locations.**

(a) Cabinets, cutout boxes, fittings, boxes, and panel-board enclosures in damp or wet locations shall be installed so as to prevent moisture or water from entering and accumulating within the enclosures. In wet locations the enclosures shall be weatherproof.

(b) Switches, circuit breakers, and switchboards installed in wet locations shall be enclosed in weatherproof enclosures.

(6) **Conductors for general wiring.** All conductors used for general wiring shall be insulated unless otherwise permitted in this section. The conductor insulation shall be of a type that is approved for the voltage, operating temperature, and location of use. Insulated conductors shall be distinguishable by appropriate color or other suitable means as being grounded conductors, ungrounded conductors, or equipment grounding conductors.

(7) **Flexible cords and cables.**

(a) **Use of flexible cords and cables.**

(i) Flexible cords and cables shall be approved and suitable for conditions of use and location. Flexible cords and cables shall be used only for:

(A) Pendants;

(B) Wiring of fixtures;

(C) Connection of portable lamps or appliances;

(D) Elevator cables;

(E) Wiring of cranes and hoists;

(F) Connection of stationary equipment to facilitate their frequent interchange;

(G) Prevention of the transmission of noise or vibration;

(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.

(ii) If used as permitted in subitem (a)(i)(C), (a)(i)(F) or (a)(i)(H) of this subsection, the flexible cord shall be equipped with an attachment plug and shall be energized from an approved receptacle outlet.

(iii) Unless specifically permitted in item (a)(i) of this subsection, flexible cords and cables may 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.

(iv) Flexible cords used in show windows and show-cases shall 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.

(b) **Identification, splices, and terminations.**

(i) A conductor of a flexible cord or cable that is used as a grounded conductor or an equipment grounding

conductor shall be distinguishable from other conductors. Types SJ, SJO, SJT, SJTO, S, SO, ST, and STO shall be durably marked on the surface with the type designation, size, and number of conductors.

(ii) Flexible cords shall be used only in continuous lengths without splice or tap. Hard service flexible cords No. 12 or larger may be repaired if spliced so that the splice retains the insulation, outer sheath properties, and usage characteristics of the cord being spliced.

(iii) Flexible cords shall be connected to devices and fittings so that strain relief is provided which will prevent pull from being directly transmitted to joints or terminal screws.

(8) **Portable cables over 600 volts, nominal.** Multiconductor portable cable for use in supplying power to portable or mobile equipment at over 600 volts, nominal, shall consist of No. 8 or larger conductors employing flexible stranding. Cables operated at over 2,000 volts shall be shielded for the purpose of confining the voltage stresses to the insulation. Grounding conductors shall be provided. Connectors for these cables shall be of a locking type with provisions to prevent their opening or closing while energized. Strain relief shall be provided at connections and terminations. Portable cables may not be operated with splices unless the splices are of the permanent molded, vulcanized, or other approved type. Termination enclosures shall be suitably marked with a high voltage hazard warning, and terminations shall be accessible only to authorized and qualified personnel.

(9) **Fixture wires.**

(a) **General.** Fixture wires shall be approved for the voltage, temperature, and location of use. A fixture wire which is used as a grounded conductor shall be identified.

(b) **Uses permitted.** Fixture wires may be used:

(i) For installation in lighting fixtures and in similar equipment where enclosed or protected and not subject to bending or twisting in use; or

(ii) For connecting lighting fixtures to the branch-circuit conductors supplying the fixtures.

(c) **Uses not permitted.** Fixture wires may not be used as branch-circuit conductors except as permitted for Class 1 power limited circuits.

(10) **Equipment for general use.**

(a) **Lighting fixtures, lampholders, lamps, and receptacles.**

(i) Fixtures, lampholders, lamps, rosettes, and receptacles may 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.

(ii) Handlamps of the portable type supplied through flexible cords shall be equipped with a handle of molded composition or other material approved for the purpose, and a substantial guard shall be attached to the lampholder or the handle.

(iii) Lampholders of the screw-shell type shall be installed for use as lampholders only. Lampholders installed in wet or damp locations shall be of the weatherproof type.

(iv) Fixtures installed in wet or damp locations shall be approved for the purpose and shall be so constructed or installed that water cannot enter or accumulate in wireways, lampholders, or other electrical parts.

(b) **Receptacles, cord connectors, and attachment plugs (caps).**

(i) Receptacles, cord connectors, and attachment plugs shall be constructed so that no receptacle or cord connector will accept an attachment plug with a different voltage or current rating than that for which the device is intended. However, a 20-ampere T-slot receptacle or cord connector may accept a 15-ampere attachment plug of the same voltage rating.

(ii) A receptacle installed in a wet or damp location shall be suitable for the location.

(c) **Appliances.**

(i) Appliances, other than those in which the current-carrying parts at high temperatures are necessarily exposed, may have no live parts normally exposed to employee contact.

(ii) A means shall be provided to disconnect each appliance.

(iii) Each appliance shall be marked with its rating in volts and amperes or volts and watts.

(d) **Motors.** This paragraph applies to motors, motor circuits, and controllers.

(i) **In sight from.** If specified that one piece of equipment shall be "in sight from" another piece of equipment, one shall be visible and not more than 50 feet from the other.

(ii) **Disconnecting means.**

(A) A disconnecting means shall 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 shall disconnect the motor and the controller from all ungrounded supply conductors and shall be so designed that no pole can be operated independently.

(C) If a motor and the driven machinery are not in sight from the controller location, the installation shall comply with one of the following conditions:

(I) The controller disconnecting means shall be capable of being locked in the open position.

(II) A manually operable switch that will disconnect the motor from its source of supply shall be placed in sight from the motor location.

(D) The disconnecting means shall plainly indicate whether it is in the open (off) or closed (on) position.

(E) The disconnecting means shall be readily accessible. If more than one disconnect is provided for the same equipment, only one need be readily accessible.

(F) An individual disconnecting means shall be provided for each motor, but a single disconnecting means

may be used for a group of motors under any one of the following conditions:

(I) If a number of motors drive special parts of a single machine or piece of apparatus, such as a metal or woodworking machine, crane, or hoist;

(II) If a group of motors is under the protection of one set of branch-circuit protective devices; or

(III) If a group of motors is in a single room in sight from the location of the disconnecting means.

(iii) **Motor overload, short-circuit, and ground-fault protection.** Motors, motor-control apparatus, and motor branch-circuit conductors shall be protected against overheating due to motor overloads or failure to start, and against short-circuits or ground faults. These provisions shall not require overload protection that will stop a motor where a shutdown is likely to introduce additional or increased hazards, as in the case of fire pumps, or where continued operation of a motor is necessary for a safe shutdown of equipment or process and motor overload sensing devices are connected to a supervised alarm.

(iv) **Protection of live parts—all voltages.**

(A) Stationary motors having commutators, collectors, and brush rigging located inside of motor end brackets and not conductively connected to supply circuits operating at more than 150 volts to ground need not have such parts guarded. Exposed live parts of motors and controllers operating at 50 volts or more between terminals shall be guarded against accidental contact by any of the following:

(I) By installation in a room or enclosure that is accessible only to qualified persons;

(II) By installation on a suitable balcony, gallery, or platform, so elevated and arranged as 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 shall be provided so that the attendant cannot readily touch live parts unless standing on the mats or platforms.

(e) **Transformers.**

(i) The following paragraphs cover the installation of all transformers except the following:

(A) Current transformers;

(B) Dry-type transformers installed as a component part of other apparatus;

(C) Transformers which are an integral part of an x-ray, high frequency, or electrostatic-coating apparatus;

(D) Transformers used with Class 2 and Class 3 circuits, sign and outline lighting, electric discharge lighting, and power-limited fire-protective signalling circuits; and

(E) Liquid-filled or dry-type transformers used for research, development, or testing, where effective safeguard arrangements are provided.

(ii) The operating voltage of exposed live parts of transformer installations shall be indicated by warning signs or visible markings on the equipment or structure.

(iii) Dry-type, high fire point liquid-insulated, and askarel-insulated transformers installed indoors and rated over 35kV shall be in a vault.

(iv) If they present a fire hazard to employees, oil-insulated transformers installed indoors shall be in a vault.

(v) Combustible material, combustible buildings and parts of buildings, fire escapes, and door and window openings shall be safeguarded from fires which may originate in oil-insulated transformers attached to or adjacent to a building or combustible material.

(vi) Transformer vaults shall be constructed so as to contain fire and combustible liquids within the vault and to prevent unauthorized access. Locks and latches shall be so arranged that a vault door can be readily opened from the inside.

(vii) Any pipe or duct system foreign to the vault installation may not enter or pass through a transformer vault.

(viii) Materials may not be stored in transformer vaults.

(f) **Capacitors.**

(i) All capacitors, except surge capacitors or capacitors included as a component part of other apparatus, shall be provided with an automatic means of draining the stored charge after the capacitor is disconnected from its source of supply.

(ii) Capacitors rated over 600 volts, nominal, shall comply with the following additional requirements:

(A) Isolating or disconnecting switches (with no interrupting rating) shall be interlocked with the load interrupting device or shall be provided with prominently displayed caution signs to prevent switching load current.

(B) For series capacitors (see WAC 296-24-95603 (2)(c)), the proper switching shall be assured by use of at least one of the following:

(I) Mechanically sequenced isolating and bypass switches;

(II) Interlocks; or

(III) Switching procedure prominently displayed at the switching location.

(g) **Storage batteries.** Provisions shall be made for sufficient diffusion and ventilation of gases from storage batteries to prevent the accumulation of explosive mixtures.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-24-95609, filed 11/30/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 82-08-026 (Order 82-10), § 296-24-95609, filed 3/30/82.]

WAC 296-24-95611 Specific purpose equipment and installations. (1) Electric signs and outline lighting.

(a) **Disconnecting means.** Signs operated by electronic or electromechanical controllers located outside the sign shall have a disconnecting means located inside the controller enclosure or within sight of the controller location, and it shall be capable of being locked in the open

position. Such disconnecting means shall have no pole that can be operated independently, and it shall open all ungrounded conductors that supply the controller and sign. All other signs, except the portable type, and all outline lighting installations shall have an externally operable disconnecting means which can open all ungrounded conductors and is within the sight of the sign or outline lighting it controls.

(b) Doors or covers giving access to uninsulated parts of indoor signs or outline lighting exceeding 600 volts and accessible to other than qualified persons shall either be provided with interlock switches to disconnect the primary circuit or shall be so fastened that the use of other than ordinary tools will be necessary to open them.

(2) **Cranes and hoists.** This subsection applies to the installation of electric equipment and wiring used in connection with cranes, monorail hoists, hoists, and all runways.

(a) **Disconnecting means.**

(i) A readily accessible disconnecting means shall be provided between the runway contact conductors and the power supply.

(ii) Another disconnecting means, capable of being locked in the open position, shall be provided in the leads from the runway contact conductors or other power supply on any crane or monorail hoist.

(A) If this additional disconnection means is not readily accessible from the crane or monorail hoist operating station means shall be provided at the operating station, to open the power circuit to all motors of the crane or monorail hoist.

(B) The additional disconnect may be omitted if a monorail hoist or hand-propelled crane bridge installation meets all of the following:

(I) The unit is floor controlled;

(II) The unit is within view of the power supply disconnecting means; and

(III) No fixed work platform has been provided for servicing the unit.

(b) **Control.** A limit switch or other device shall be provided to prevent the load block from passing the safe upper limit of travel of any hoisting mechanism.

(c) **Clearance.** The dimension of the working space in the direction of access to live parts which may require examination, adjustment, servicing, or maintenance while alive shall be a minimum of 2 feet 6 inches. Where controls are enclosed in cabinets, the door(s) shall either open at least 90 degrees or be removable.

(3) **Elevators, dumbwaiters, escalators, and moving walks.**

(a) **Disconnecting means.** Elevators, dumbwaiters, escalators, and moving walks shall have a single means for disconnecting all ungrounded main power supply conductors for each unit.

(b) **Warning signs.** 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 shall be mounted on or adjacent to the disconnecting means. The sign shall be clearly legible and shall read "Warning—Parts of the control panel are not de-

energized by this switch." (See WAC 296-24-95603 (2)(c).)

(c) **Control panels.** If control panels are not located in the same space as the drive machine, they shall be located in cabinets with doors or panels capable of being locked closed.

(4) **Electric welders—disconnecting means.**

(a) A disconnecting means shall be provided in the supply circuit for each motor-generator arc welder, and for each AC transformer and DC rectifier arc welder which is not equipped with a disconnect mounted as an integral part of the welder.

(b) A switch or circuit breaker shall be provided by which each resistance welder and its control equipment can be isolated from the supply circuit. The ampere rating of this disconnecting means may not be less than the supply conductor ampacity.

(5) **Data processing systems—disconnecting means.** A disconnecting means shall be provided to disconnect the power to all electronic equipment in data processing or computer rooms. This disconnecting means shall be controlled from locations readily accessible to the operator at the principal exit doors. There shall also be a similar disconnecting means to disconnect the air conditioning system serving this area.

(6) **X-ray equipment.** This subsection applies to x-ray equipment for other than medical or dental use.

(a) **Disconnecting means.**

(i) A disconnecting means shall be provided in the supply circuit. The disconnecting means shall be operable from a location readily accessible from the x-ray control. For equipment connected to a 120-volt branch circuit of 30 amperes or less, a grounding-type attachment plug cap and receptacle of proper rating may serve as a disconnecting means.

(ii) If more than one piece of equipment is operated from the same high-voltage circuit, each piece or each group of equipment as a unit shall be provided with a high-voltage switch or equivalent disconnecting means. This disconnecting means shall be constructed, enclosed, or located so as to avoid contact by employees with its live parts.

(b) **Control.**

(i) **Radiographic and fluoroscopic types.** Radiographic and fluoroscopic-type equipment shall be effectively enclosed or shall have interlocks that de-energize the equipment automatically to prevent ready access to live current-carrying parts.

(ii) **Diffraction and irradiation types.** Diffraction-type and irradiation-type equipment shall be provided with a means to indicate when it is energized unless the equipment or installation is effectively enclosed or is provided with interlocks to prevent access to live current-carrying parts during operation.

(7) **Induction and dielectric heating equipment.**

(a) **Scope.** Subdivisions (b) and (c) of this subsection cover induction and dielectric heating equipment and accessories for industrial and scientific applications, but not for medical dental applications or for appliances.

(b) **Guarding and grounding.**

(i) **Enclosures.** The converting apparatus (including the DC line) and high-frequency electric circuits (excluding the output circuits and remote-control circuits) shall be completely contained within enclosures of non-combustible material.

(ii) **Panel controls.** All panel controls shall be of dead-front construction.

(iii) **Access to internal equipment.** Where doors are used for access to voltages from 500 to 1000 volts AC or DC, either door locks or interlocks shall be provided. Where doors are used for access to voltages of over 1000 volts AC or DC, either mechanical lockouts with a disconnecting means to prevent access until voltage is removed from the cubicle, or both door interlocking and mechanical door locks, shall be provided.

(iv) **Warning labels.** "Danger" labels shall be attached on the equipment and shall be plainly visible even when doors are open or panels are removed from compartments containing voltages of over 250 volts AC or DC.

(v) **Work applicator shielding.** Protective cages or adequate shielding shall be used to guard work applicators other than induction heating coils. Induction heating coils shall be protected by insulation and/or refractory materials. Interlock switches shall be used on all hinged access doors, sliding panels, or other such means of access to the applicator. Interlock switches shall be connected in such a manner as to remove all power from the applicator when any one of the access doors or panels is open. Interlocks on access doors or panels are not required if the applicator is an induction heating coil at DC ground potential or operating at less than 150 volts AC.

(vi) **Disconnecting means.** A readily accessible disconnecting means shall be provided by which each unit of heating equipment can be isolated from its supply circuit.

(c) **Remote control.** If remote controls are used for applying power, a selector switch shall be provided and interlocked to provide power from only one control point at a time. Switches operated by foot pressure shall be provided with a shield over the contact button to avoid accidental closing the switch.

(8) **Electrolytic cells.**

(a) **Scope.** These provisions for electrolytic cells apply to the installation of the electrical components and accessory equipment of electrolytic cells, electrolytic cell lines, and process power supply for the production of aluminum, cadmium, chlorine, copper, fluorine, hydrogen peroxide, magnesium, sodium, sodium chlorate, and zinc. Cells used as a source of electric energy and for electroplating processes and cells used for production of hydrogen are not covered by these provisions.

(b) **Definitions applicable to this subsection.**

Cell line: An assembly of electrically interconnected electrolytic cells supplied by a source of direct-current power.

Cell line attachments and auxiliary equipment: Cell line attachments and auxiliary equipment include, but are not limited to: Auxiliary tanks; process piping; duct work; structural supports; exposed cell line conductors;

conduits and other raceways; pumps; positioning equipment and cell cutout or bypass electrical devices. Auxiliary equipment also includes tools, welding machines, crucibles, and other portable equipment used for operation and maintenance within the electrolytic cell line working zone. In the cell line working zone, auxiliary equipment includes the exposed conductive surfaces of ungrounded cranes and crane-mounted cell-servicing equipment.

Cell line working zone: The cell line working zone is the space envelope wherein operation or maintenance is normally performed on or in the vicinity of exposed energized surfaces of cell lines or their attachments.

Electrolytic cells: A receptacle or vessel in which electrochemical reactions are caused by applying energy for the purpose of refining or producing usable materials.

(c) **Application.** Installations covered by subsection (8) of this section shall comply with all applicable provisions of this section except as follows:

(i) Overcurrent protection of electrolytic cell DC process power circuits need not comply with the requirements of WAC 296-24-95607(5).

(ii) Equipment located or used within the cell line working zone or associated with the cell line DC power circuits need not comply with the provisions of WAC 296-24-95607(6).

(iii) Electrolytic cells, cell line conductors, cell line attachments, and the wiring of auxiliary equipment and devices within the cell line working zone need not comply with the provisions of WAC 296-24-95605 and 296-24-95607 (2) and (3).

(d) **Disconnecting means.**

(i) If more than one DC cell line process power supply serves the same cell line, a disconnecting means shall be provided on the cell line circuit side of each power supply to disconnect it from the cell line circuit.

(ii) Removable links or removable conductors may be used as the disconnecting means.

(e) **Portable electric equipment.**

(i) The frames and enclosures of portable electric equipment used within the cell line working zone may not be grounded. However, these frames and enclosures may be grounded if the cell line circuit voltage does not exceed 200 volts DC or if the frames are guarded.

(ii) Ungrounded portable electric equipment shall be distinctively marked and may not be interchangeable with grounded portable electric equipment.

(f) **Power supply circuits and receptacles for portable electric equipment.**

(i) Circuits supplying power to ungrounded receptacles for hand-held, cord-and plug-connected equipment shall be electrically isolated from any distribution system supplying areas other than the cell line working zone and shall be ungrounded. Power for these circuits shall be supplied through isolating transformers.

(ii) Receptacles and their mating plugs for ungrounded equipment may not have provision for a grounding conductor and shall be of a configuration which prevents their use for equipment required to be grounded.

(iii) Receptacles on circuits supplied by an isolating transformer with an ungrounded secondary shall have a distinctive configuration, shall be distinctively marked, and may not be used in any other location in the plant.

(g) Fixed and portable electric equipment.

(i) AC systems supplying fixed and portable electric equipment within the cell line working zone need not be grounded.

(ii) Exposed conductive surfaces, such as electric equipment housings, cabinets, boxes, motors, raceways and the like that are within the cell line working zone need not be grounded.

(iii) Auxiliary electrical devices, such as motors, transducers, sensors, control devices, and alarms, mounted on an electrolytic cell or other energized surface, shall be connected by any of the following means:

(A) Multiconductor hard usage or extra hard usage flexible cord;

(B) Wire or cable in suitable raceways; or

(C) Exposed metal conduit, cable tray, armored cable, or similar metallic systems installed with insulating breaks such that they will not cause a potentially hazardous electrical condition.

(iv) Fixed electric equipment may be bonded to the energized conductive surfaces of the cell line, its attachments, or auxiliaries. If fixed electric equipment is mounted on an energized conductive surface, it shall be bonded to that surface.

(h) **Auxiliary nonelectric connections.** Auxiliary nonelectric connections, such as air hoses, water hoses, and the like, to an electrolytic cell, its attachments, or auxiliary equipment may not have continuous conductive reinforcing wire, armor, braids, and the like. Hoses shall be of a nonconductive material.

(i) Cranes and hoists.

(i) The conductive surfaces of cranes and hoists that enter the cell line working zone need not be grounded. The portion of an overhead crane or hoist which contacts an energized electrolytic cell or energized attachments shall be insulated from ground.

(ii) Remote crane or hoist controls which may introduce hazardous electrical conditions into the cell line working zone shall employ one or more of the following systems:

(A) Insulated and ungrounded control circuit;

(B) Nonconductive rope operator;

(C) Pendent pushbutton with nonconductive supporting means and having nonconductive surfaces or ungrounded exposed conductive surfaces; or

(D) Radio.

(9) Electrically driven or controlled irrigation machines. (See WAC 296-24-95603 (2)(c).)

(a) **Lightning protection.** If an electrically driven or controlled irrigation machine has a stationary point, a driven ground rod shall be connected to the machine at the stationary point for lightning protection.

(b) **Disconnecting means.** The main disconnecting means for a center pivot irrigation machine shall be located at the point of connection of electrical power to the machine and shall be readily accessible and capable

of being locked in the open position. A disconnecting means shall be provided for each motor and controller.

(10) Swimming pools, fountains, and similar installations.

(a) **Scope.** Subdivisions (b) through (e) of this subsection apply to electric wiring for and equipment in or adjacent to all swimming, wading, therapeutic, and decorative pools and fountains, whether permanently installed or storable, and to metallic auxiliary equipment, such as pumps, filters, and similar equipment. Therapeutic pools in health care facilities are exempt from these provisions.

(b) Lighting and receptacles.

(i) **Receptacles.** A single receptacle of the locking and grounding type that provides power for a permanently installed swimming pool recirculating pump motor may be located not less than 5 feet from the inside walls of a pool. All other receptacles on the property shall be located at least 10 feet from the inside walls of a pool. Receptacles which are located within 15 feet of the inside walls of the pool shall be protected by ground-fault circuit interrupters.

Note: In determining these dimensions, the distance to be measured is the shortest path the supply cord of an appliance connected to the receptacle would follow without piercing a floor, wall, or ceiling of a building or other effective permanent barrier.

(ii) Lighting fixtures and lighting outlets.

(A) Unless they are 12 feet above the maximum water level, lighting fixtures and lighting outlets may not be installed over a pool or over the area extending 5 feet horizontally from the inside walls of a pool. However, a lighting fixture or lighting outlet which has been installed before April 16, 1981, may be located less than 5 feet measured horizontally from the inside walls of a pool if it is at least 5 feet above the surface of the maximum water level and shall be rigidly attached to the existing structure. It shall also be protected by a ground-fault circuit interrupter installed in the branch circuit supplying the fixture.

(B) Unless installed 5 feet above the maximum water level and rigidly attached to the structure adjacent to or enclosing the pool, lighting fixtures and lighting outlets installed in the area extending between 5 feet and 10 feet horizontally from the inside walls of a pool shall be protected by a ground-fault circuit interrupter.

(c) **Cord-connected and plug-connected equipment.** Flexible cords used with the following equipment may not exceed 3 feet in length and shall have a copper equipment grounding conductor with a grounding-type attachment plug.

(i) Cord-connected and plug-connected lighting fixtures installed within 16 feet of the water surface of permanently installed pools.

(ii) Other cord-connected and plug-connected, fixed or stationary equipment used with permanently installed pools.

(d) Underwater equipment.

(i) A ground-fault circuit interrupter shall be installed in the branch circuit supplying underwater fixtures operating at more than 15 volts. Equipment installed underwater shall be approved for the purpose.

(ii) No underwater lighting fixtures may be installed for operation at over 150 volts between conductors.

(c) **Fountains.** All electric equipment operating at more than 15 volts, including power supply cords, used with fountains shall be protected by ground-fault circuit interrupters. (See WAC 296-24-95603 (2)(c).)

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-24-95611, filed 11/30/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 82-08-026 (Order 82-10), § 296-24-95611, filed 3/30/82.]

WAC 296-24-95613 Hazardous (classified) locations. (1) **Scope.** This section covers the requirements for electric equipment and wiring in locations which are classified depending on the properties of the flammable vapors, liquids or gases, or combustible dusts or fibers which may be present therein and the likelihood that a flammable combustible concentration or quantity is present. Hazardous (classified) locations may be found in occupancies such as, but not limited to, the following: Aircraft hangars, gasoline dispensing and service stations, bulk storage plants for gasoline or other volatile flammable liquids, paint-finishing process plants, health care facilities, agricultural or other facilities where excessive combustible dusts may be present, marinas, boat yards, and petroleum and chemical processing plants. Each room, section or area shall be considered individually in determining its classification. These hazardous (classified) locations are assigned six designations as follows:

Class I,	Division 1
Class I,	Division 2
Class II,	Division 1
Class II,	Division 2
Class III,	Division 1
Class III,	Division 2

For definitions of these locations see WAC 296-24-95601(1). All applicable requirements in this subpart shall apply to hazardous (classified) locations, unless modified by provisions of this section.

(2) **Electrical installations.** Equipment, wiring methods, and installations of equipment in hazardous (classified) locations shall be intrinsically safe, or approved for the hazardous (classified) location, or safe for the hazardous (classified) location. Requirements for each of these options are as follows:

(a) **Intrinsically safe.** Equipment and associated wiring approved as intrinsically safe shall be permitted in any hazardous (classified) location for which it is approved.

(b) **Approved for the hazardous (classified) location.**

(i) Equipment shall be approved not only for the class of location but also for the ignitable or combustible properties of the specific gas, vapor, dust, or fiber that will be present.

Note: NFPA 70, the National Electrical Code, lists or defines hazardous gases, vapors, and dusts by "groups" characterized by their ignitable or combustible properties.

(ii) Equipment shall be marked to show the class, group, and operating temperature or temperature range,

based on operation in a 40 degrees C ambient, for which it is approved. The temperature marking may not exceed the ignition temperature of the specific gas or vapor to be encountered. However, the following provisions modify this marking requirement for specific equipment:

(A) Equipment of the nonheat-producing type, such as junction boxes, conduit, and fittings, and equipment of the heat-producing type having a maximum temperature not more than 100 degrees C (212 degrees F) need not have a marked operating temperature or temperature range.

(B) Fixed lighting fixtures marked for use in Class I, Division 2 locations only, need not be marked to indicate the group.

(C) Fixed general-purpose equipment in Class I locations, other than lighting fixtures, which is acceptable for use in Class I, Division 2 locations need not be marked with the class, group, division, or operating temperature.

(D) Fixed dust-tight equipment, other than lighting fixtures, which is acceptable for use in Class II, Division 2 and Class III locations need not be marked with the class, group, division, or operating temperature.

(c) **Safe for the hazardous (classified) location.** Equipment which is safe for the location shall be of a type and design which the employer demonstrates will provide protection from the hazards arising from the combustibility and flammability of vapors, liquids, gases, dusts, or fibers.

Note: The National Electrical Code, NFPA 70, contains guidelines for determining the type and design of equipment and installations which will meet this requirement. The guidelines of this document address electric wiring, equipment, and systems installed in hazardous (classified) locations and contain specific provisions for the following: Wiring methods, wiring connections; conductor insulation, flexible cords, sealing and drainage, transformers, capacitors, switches, circuit breakers, fuses, motor controllers, receptacles, attachment plugs, meters, relays, instruments, resistors, generators, motors, lighting fixtures, storage battery charging equipment, electric cranes, electric hoists and similar equipment, utilization equipment, signaling systems, alarm systems, remote control systems, local loud speaker and communication systems, ventilation piping, live parts, lighting surge protection, and grounding. Compliance with these guidelines will constitute one means, but not the only means, of compliance with this subsection.

(3) **Conduits.** All conduits shall be threaded and shall be made wrench-tight. Where it is impractical to make a threaded joint tight, a bonding jumper shall be utilized.

(4) **Equipment in Division 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.

(5) **Motors and generators.** Motors and generators shall conform to the following: Class I, Division 1. In Class I, Division 1 locations, motors, generators and other rotating electric machinery shall be: (a) Approved for Class I, Division 1 locations (explosion-proof); or (b)

of the totally enclosed type supplied with positive-pressure ventilation from a source of clean air with discharge to a safe area, so 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 (c) 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 (d) of a type designed to be submerged in a liquid which 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 so 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 motors of types (b) and (c) shall have no external surface with an operating temperature in degrees Celsius in excess of eighty percent of the ignition temperature of the gas or vapor involved, as determined by ASTM test procedure (Designation: D-2155-69). Appropriate devices shall be provided to detect any increase in temperature of the motor beyond design limits and automatically deenergize the equipment or provide an adequate alarm. Auxiliary equipment shall be of a type approved for the location in which it is installed.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-24-95613, filed 11/30/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 82-08-026 (Order 82-10), § 296-24-95613, filed 3/30/82.]

Chapter 296-27 WAC

RECORDKEEPING AND REPORTING

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- 296-27-16001 Definitions.
- 296-27-16002 Inspection hours.
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- 296-27-16005 Repealed.
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- 296-27-16011 Refusal or limitation of inspection.
- 296-27-16013 Repealed.
- 296-27-16015 Repealed.
- 296-27-16017 Repealed.
- 296-27-16018 Compliance inspections.
- 296-27-16019 Repealed.
- 296-27-16020 Inspection selection, scheduling criteria, and limit on number of inspections.
- 296-27-16021 Repealed.
- 296-27-16022 Unprogrammed inspections, follow-up inspections, monitoring inspections, and "high hazard" inspections.
- 296-27-16023 Repealed.
- 296-27-16026 Programmed inspections.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

- 296-27-16005 Objects of inspection. [Statutory Authority: RCW 49.17.040 and 49.17.050. 81-14-006 (Order 81-13), § 296-27-16005, filed 6/22/81.] Repealed by 87-03-011 (Order 86-48), filed 1/12/87. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-27-16009 Follow-up inspections. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-27-16009, filed 1/17/86; 81-14-006 (Order 81-13), § 296-27-16009, filed 6/22/81.] Repealed by 87-03-011 (Order 86-48), filed 1/12/87. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-27-16013 WISHA—Required investigations and inspections. [Statutory Authority: RCW 49.17.040 and 49.17.050. 81-14-006 (Order 81-13), § 296-27-16013, filed 6/22/81.] Repealed by 87-03-011 (Order 86-48), filed 1/12/87. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-27-16015 WITS—In general. [Statutory Authority: RCW 49.17.040 and 49.17.050. 81-14-006 (Order 81-13), § 296-27-16015, filed 6/22/81.] Repealed by 87-03-011 (Order 86-48), filed 1/12/87. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-27-16017 WITS—Safety. [Statutory Authority: RCW 49.17.040 and 49.17.050. 81-14-006 (Order 81-13), § 296-27-16017, filed 6/22/81.] Repealed by 87-03-011 (Order 86-48), filed 1/12/87. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-27-16019 WITS—Safety. [Statutory Authority: RCW 49.17.040 and 49.17.050. 81-14-006 (Order 81-13), § 296-27-16019, filed 6/22/81.] Repealed by 87-03-011 (Order 86-48), filed 1/12/87. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-27-16021 WITS—Safety—Limit on number of inspections. [Statutory Authority: RCW 49.17.040 and 49.17.050. 81-14-006 (Order 81-13), § 296-27-16021, filed 6/22/81.] Repealed by 87-03-011 (Order 86-48), filed 1/12/87. Statutory Authority: RCW 49.17.040 and 49.17.050.
- 296-27-16023 Adjustment factors. [Statutory Authority: RCW 49.17.040 and 49.17.050. 81-14-006 (Order 81-13), § 296-27-16023, filed 6/22/81.] Repealed by 87-03-011 (Order 86-48), filed 1/12/87. Statutory Authority: RCW 49.17.040 and 49.17.050.

WAC 296-27-15501 Division of industrial safety and health, public records. Requests for inspection or copies of records and documents in the custody of the division of industrial safety and health should be made to the division's designated records officer. The division's records are maintained at 805 Plum Street Southeast, P.O. Box 207, Olympia, WA 98504. General information can be obtained at service locations and field offices throughout the state.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-27-15501, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-27-15501, filed 1/17/86.]

WAC 296-27-160 Safety and health inspections. The Washington Industrial Safety and Health Act (WISHA), chapter 49.17 RCW, authorizes the department of labor and industries (the department) to inspect work places to protect the health and safety of employees. The following sections describe the method, manner, and frequency of the department's safety and health inspections. The purposes of safety and health inspections are to:

of the totally enclosed type supplied with positive-pressure ventilation from a source of clean air with discharge to a safe area, so 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 (c) 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 (d) of a type designed to be submerged in a liquid which 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 so 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 motors of types (b) and (c) shall have no external surface with an operating temperature in degrees Celsius in excess of eighty percent of the ignition temperature of the gas or vapor involved, as determined by ASTM test procedure (Designation: D-2155-69). Appropriate devices shall be provided to detect any increase in temperature of the motor beyond design limits and automatically deenergize the equipment or provide an adequate alarm. Auxiliary equipment shall be of a type approved for the location in which it is installed.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-24-95613, filed 11/30/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 82-08-026 (Order 82-10), § 296-24-95613, filed 3/30/82.]

Chapter 296-27 WAC

RECORDKEEPING AND REPORTING

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296-27-15501	Division of industrial safety and health, public records.
296-27-160	Safety and health inspections.
296-27-16001	Definitions.
296-27-16002	Inspection hours.
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296-27-16004	Interprogram referrals.
296-27-16005	Repealed.
296-27-16007	Citations, penalty assessments and notices of violations.
296-27-16009	Repealed.
296-27-16011	Refusal or limitation of inspection.
296-27-16013	Repealed.
296-27-16015	Repealed.
296-27-16017	Repealed.
296-27-16018	Compliance inspections.
296-27-16019	Repealed.
296-27-16020	Inspection selection, scheduling criteria, and limit on number of inspections.
296-27-16021	Repealed.
296-27-16022	Unprogrammed inspections, follow-up inspections, monitoring inspections, and "high hazard" inspections.
296-27-16023	Repealed.
296-27-16026	Programmed inspections.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-27-16005	Objects of inspection. [Statutory Authority: RCW 49.17.040 and 49.17.050. 81-14-006 (Order 81-13), § 296-27-16005, filed 6/22/81.] Repealed by 87-03-011 (Order 86-48), filed 1/12/87. Statutory Authority: RCW 49.17.040 and 49.17.050.
296-27-16009	Follow-up inspections. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-27-16009, filed 1/17/86; 81-14-006 (Order 81-13), § 296-27-16009, filed 6/22/81.] Repealed by 87-03-011 (Order 86-48), filed 1/12/87. Statutory Authority: RCW 49.17.040 and 49.17.050.
296-27-16013	WISHA—Required investigations and inspections. [Statutory Authority: RCW 49.17.040 and 49.17.050. 81-14-006 (Order 81-13), § 296-27-16013, filed 6/22/81.] Repealed by 87-03-011 (Order 86-48), filed 1/12/87. Statutory Authority: RCW 49.17.040 and 49.17.050.
296-27-16015	WITS—In general. [Statutory Authority: RCW 49.17.040 and 49.17.050. 81-14-006 (Order 81-13), § 296-27-16015, filed 6/22/81.] Repealed by 87-03-011 (Order 86-48), filed 1/12/87. Statutory Authority: RCW 49.17.040 and 49.17.050.
296-27-16017	WITS—Safety. [Statutory Authority: RCW 49.17.040 and 49.17.050. 81-14-006 (Order 81-13), § 296-27-16017, filed 6/22/81.] Repealed by 87-03-011 (Order 86-48), filed 1/12/87. Statutory Authority: RCW 49.17.040 and 49.17.050.
296-27-16019	WITS—Safety. [Statutory Authority: RCW 49.17.040 and 49.17.050. 81-14-006 (Order 81-13), § 296-27-16019, filed 6/22/81.] Repealed by 87-03-011 (Order 86-48), filed 1/12/87. Statutory Authority: RCW 49.17.040 and 49.17.050.
296-27-16021	WITS—Safety—Limit on number of inspections. [Statutory Authority: RCW 49.17.040 and 49.17.050. 81-14-006 (Order 81-13), § 296-27-16021, filed 6/22/81.] Repealed by 87-03-011 (Order 86-48), filed 1/12/87. Statutory Authority: RCW 49.17.040 and 49.17.050.
296-27-16023	Adjustment factors. [Statutory Authority: RCW 49.17.040 and 49.17.050. 81-14-006 (Order 81-13), § 296-27-16023, filed 6/22/81.] Repealed by 87-03-011 (Order 86-48), filed 1/12/87. Statutory Authority: RCW 49.17.040 and 49.17.050.

WAC 296-27-15501 Division of industrial safety and health, public records. Requests for inspection or copies of records and documents in the custody of the division of industrial safety and health should be made to the division's designated records officer. The division's records are maintained at 805 Plum Street Southeast, P.O. Box 207, Olympia, WA 98504. General information can be obtained at service locations and field offices throughout the state.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-27-15501, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-27-15501, filed 1/17/86.]

WAC 296-27-160 Safety and health inspections. The Washington Industrial Safety and Health Act (WISHA), chapter 49.17 RCW, authorizes the department of labor and industries (the department) to inspect work places to protect the health and safety of employees. The following sections describe the method, manner, and frequency of the department's safety and health inspections. The purposes of safety and health inspections are to:

(1) Determine if an employer is complying with WISHA safety and health standards; and

(2) Determine if an employer is furnishing a place of employment free from recognized hazards that are causing or are likely to cause death or serious physical harm to their employees.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 87-03-011 (Order 86-48), § 296-27-160, filed 1/12/87; 81-14-006 (Order 81-13), § 296-27-160, filed 6/22/81.]

WAC 296-27-16001 Definitions. For the purpose of these inspection rules:

(1) "Department" shall mean the department of labor and industries.

(2) "Industrial insurance modification factor" is based on a comparison of the actual incurred losses to the expected losses for the oldest three of the four fiscal years preceding the effective date of premium rates.

(a) A modification factor greater than 1.0000 indicates that an employer's actual incurred losses are greater than expected.

(b) A modification factor of less than 1.0000 indicates that an employer's actual incurred losses are less than expected.

(c) New firms and some firms qualifying for transition rating adjustments are assigned a base modification factor of 1.0000. Self-insured employers will be assigned a modification factor of less than 1.0000.

(3) "Industry" shall mean a group of businesses classified by standard industrial classification (SIC) code according to the type of activity in which they are engaged.

(4) "WISHA" shall mean the Washington Industrial Safety and Health Act.

(5) "Working hours" shall mean those times that an employer assigns an employee or employees to work at the work place.

(6) "Work place," "work site," and "job site" may be used interchangeably in the text of this chapter and shall mean any plant, yard, premises, room, or other place where an employee or employees are employed for the performance of labor or service over which the employer has the right of access or control. Work place shall include temporary labor camps.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 87-03-011 (Order 86-48), § 296-27-16001, filed 1/12/87; 81-14-006 (Order 81-13), § 296-27-16001, filed 6/22/81.]

WAC 296-27-16002 Inspection hours. An inspection shall be made during the normal working hours of the work place being inspected, unless:

(1) The inspection is of a fatality;

(2) The inspection is of a catastrophe;

(3) The inspection is of a complaint alleging imminent danger;

(4) The inspector needs to remain at the work place outside of working hours to ensure that the inspection is effective.

Note: RCW 49.17.190(1) prohibits an employer from receiving advance notice of an inspection, except as authorized by the director or an authorized representative.

[Statutory Authority: RCW 49.17.040 and 49.17.050, 87-03-011 (Order 86-48), § 296-27-16002, filed 1/12/87.]

WAC 296-27-16003 Inspection format. (1) Upon arrival, the inspector shall present credentials to the highest available management official or designated company representative at the work place and explain the nature and purpose of the visit.

(a) The inspector may sign a visitors' register, plant pass or other book or form used to control the entry and movement of persons.

(b) If a governmental security clearance is required for entry, the inspector shall obtain it before the inspection.

(2) Before beginning an inspection, the inspector should conduct a joint opening conference with the employer and employee representatives.

(a) The employee representative is the employee designated by the union, safety committee, or employees to accompany the inspector during the inspection.

(b) If the inspector determines that an employee representative is not available at the work place, separate conferences with the employer and employee representatives may be held.

(3) A representative of the employer and a representative authorized by the employees shall have the opportunity to accompany the inspector during the inspection.

(4) During the inspection, the inspector may interview in private any employee who wants to discuss a possible violation.

(a) If the inspector determines that an interview would unduly hinder an employer's operations the inspector will interview the employee during a break or after working hours.

(b) To determine whether an interview would unduly hinder an employer's operations, the inspector may consider such factors as:

(i) The time the employee would spend away from the work station;

(ii) The effects on other workers;

(iii) The effect on the work process.

(5) If the inspector receives a complaint during an inspection, the alleged violation will be investigated during the inspection.

(6) The inspector may photograph a violation, take samples, conduct tests, use sampling devices worn by employees, and employ other reasonable investigative techniques. A technique shall not be used if it reasonably could be believed to cause a hazard.

(7) The inspector shall determine that the employer has posted the WISHA notice informing employees of their rights and obligations.

(8) Inspectors should examine the log and summary of recordable occupational injuries and illnesses, supplementary records of occupational injuries and illnesses, records of employee exposure to toxic chemicals and harmful physical agents, and other records relating to employee safety and health.

(9) An employer may correct violations during the inspection.

(10) A violation remains the basis for a citation and a penalty, if warranted, whether it is corrected immediately or at a later date.

(11) The inspector will record the conditions and corrections to help judge the employer's good faith and cooperation.

(12) At the end of the inspection, the inspector will conduct a joint closing conference with the employer and employee representatives. If it is impractical to hold a joint conference or at the request of the employer or employee representative, separate conferences will be held.

(13) Complaints.

(a) Complaints shall be reduced to writing or typing on complaint forms prior to the inspections.

(b) A copy of the complaint shall be provided to the employer at the time of inspection.

(c) The complainant's name shall not appear on the employer's copy or on any record published, released, or made available without written and signed authorization by the complainant.

(14) The inspector and all concerned employees of the department shall preserve the confidentiality of trade secrets.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-03-011 (Order 86-48), § 296-27-16003, filed 1/12/87; 81-14-006 (Order 81-13), § 296-27-16003, filed 6/22/81.]

WAC 296-27-16004 Interprogram referrals. (1) A safety inspector observing potential health hazards that indicate an industrial hygiene inspection is necessary, will report the hazards and request a health inspection.

(2) A health inspector observing potential safety hazards that indicate a safety inspection is necessary, will report the hazards and request a safety inspection.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-03-011 (Order 86-48), § 296-27-16004, filed 1/12/87.]

WAC 296-27-16005 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-27-16007 Citations, penalty assessments and notices of violations. (1) The inspector shall record the violations observed on a compliance worksheet.

(2) The compliance worksheet, the photographs, and sample tests, will be used to prepare:

- (a) A citation; and
- (b) A proposed penalty assessment; and
- (c) A notice of violation.

(3) The citation and the proposed penalty assessment will be sent to the employer. The citation and notice will set an abatement date for each violation. This is the date by which the employer must correct the violation.

(4) The inspector may give a notice of violation at the end of inspection with the employers consent instead of the department issuing a citation and notice. The notice of violation sets short abatement dates and is issued only for general violations and contains no penalties. The notice of violation, shall be given to the highest available management official or designated company representative at the work place or sent to the employer.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-03-011 (Order 86-48), § 296-27-16007, filed 1/12/87; 81-14-006 (Order 81-13), § 296-27-16007, filed 6/22/81.]

WAC 296-27-16009 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-27-16011 Refusal or limitation of inspection. When the employer:

(1) Refuses to permit an inspection:

(a) The inspector will attempt to ascertain the reason(s) for refusal and report to their immediate supervisor.

(b) The department may seek an inspection warrant or other compulsory process from a court to gain entrance.

(i) If refusal to permit an inspection is anticipated, the department may seek a warrant prior to the inspection.

(ii) The department will not seek an inspection warrant in response to a complaint unless:

(A) The complaint is written and signed by a complainant; or,

(B) The complainant alleges a hazard which could cause serious injury or death.

(2) Permits an inspection but interferes with, or limits the process:

(a) The inspector will attempt to ascertain the reason for interference of limitation, report to their immediate supervisor, and will:

(i) End the inspection;

(ii) Continue the inspection noting areas of interferences or limitations.

(b) The department may seek an inspection warrant or other compulsory process from a court to revisit the areas where interference or limitation occurred. The department will not seek an inspection warrant in response to a complaint unless:

(i) The complaint is written and signed by a complainant;

(ii) The complaint alleges imminent danger to the safety or health of an individual.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-03-011 (Order 86-48), § 296-27-16011, filed 1/12/87; 83-24-013 (Order 83-34), § 296-27-16011, filed 11/30/83; 81-14-006 (Order 81-13), § 296-27-16011, filed 6/22/81.]

WAC 296-27-16013 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-27-16015 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-27-16017 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-27-16018 Compliance inspections. (1) Inspection types.

(a) Unprogrammed. Inspections are in response to suspected or alleged hazardous working conditions at a specific work site. This type of inspection addresses:

(i) Imminent danger;

- (ii) Fatalities;
- (iii) Catastrophies;
- (iv) Complaints;
- (v) Referrals;
- (vi) Follow-up inspections;
- (vii) "High hazard" industries.

(b) Programmed. Programmed inspections are inspections of worksites which have been selected based upon objective criteria. The worksites are selected and scheduled according to state-wide scheduling plans for:

- (i) Safety compliance;
 - (ii) Health compliance;
 - (iii) Compliance special-emphasis programs.
- (2) Inspection scope. Unprogrammed and programmed inspections may be:

(a) Comprehensive inspection. This category includes a complete walkaround inspection of the entire establishment.

(b) Partial. This category includes any inspection in which the walkaround is limited to specific areas, operations or conditions within the establishment but does not include all potentially hazardous areas of the establishment.

(3) Inspection priorities. The priority of inspections and assignment of resources within the inspection classifications shall be as follows:

- (a) Imminent danger including complaints or referrals which allege imminent danger;
- (b) Fatalities or catastrophies;
- (c) Complaints not alleging imminent danger or referrals;
- (d) "High hazard" industries;
- (e) Programmed inspections.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-03-011 (Order 86-48), § 296-27-16018, filed 1/12/87.]

WAC 296-27-16019 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-27-16020 Inspection selection, scheduling criteria, and limit on number of inspections. (1) Inspection selection criteria.

(a) WISHA's priority system for inspection scheduling is intended to distribute available resources as efficiently as possible to ensure that the maximum protection is effectively provided to the working men and women of this state.

(b) The assistant director of the industrial safety and health division shall ensure that inspections are scheduled within the framework of this chapter and are consistent with the objectives of chapter 49.17 RCW, the Washington Industrial Safety and Health Act of 1973, as currently amended, or as amended in the future.

(c) The assistant director shall not permit more than two scheduled comprehensive inspections at the same fixed site location of an individual employer within any period of twelve consecutive months.

(2) Employer contacts. Employer requests for information or voluntary compliance services will not initiate compliance inspection.

(a) Such employer requests shall not protect the establishment from compliance inspections conducted pursuant to the guidelines established by this chapter.

(b) If an employer or their representative indicates that an imminent danger exists or that a fatality or catastrophe has occurred, the assistant director shall ensure that action is taken in accordance with the inspection priority procedures established by this chapter.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-03-011 (Order 86-48), § 296-27-16020, filed 1/12/87.]

WAC 296-27-16021 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-27-16022 Unprogrammed inspections, follow-up inspections, monitoring inspections, and "high hazard" inspections. (1) Unprogrammed inspections. Inspections conducted in response to evidence of hazardous conditions at a worksite are considered unprogrammed inspections. Unprogrammed inspections (excluding follow-ups) shall normally be scheduled according to the following priorities:

(a) Reports of alleged imminent danger situations from any source including referrals and complaints regardless of formality;

(b) Fatalities/catastrophies;

(c) Complaints;

(d) "High hazard" industries.

(2) "High hazard" industry. The following industries which have nonfixed worksites are all considered to be "high hazard": Construction, logging, maritime, and electrical utilities and communications.

(a) The "high hazard" industries require a distinctly different method of inspection scheduling, not only because of their nonfixed worksites but also because the work being performed is almost always inherently dangerous and because the worksite character, conditions and work functions are dynamically and frequently changing.

(b) Inspections within the "high hazard" industries will be conducted throughout the year, whenever such work activity becomes known to the department. Within the limits of WISHA jurisdiction, inspections will be conducted without regard to the size or scope of the activity of the employer being inspected.

(3) Follow-up inspections. The seriousness of the original hazards or conditions requiring action shall be considered in assigning a priority to follow-up inspections. Follow-up inspections normally shall be conducted within ten days following the abatement date and shall take priority over programmed inspections.

(a) Follow-up inspections shall be conducted in the following situations:

(i) Willful citations;

(ii) Citations related to an imminent danger situation;

(iii) Whenever an employer fails to respond to a request for notification of compliance action by letter or other means; and

(iv) Whenever the assistant director or designee believes that circumstances indicate the need for a follow-up inspection.

(b) Follow-up inspections shall be deemed optional if the following circumstances exist:

(i) When the inspecting compliance officer has observed and documented that abatement has been achieved before completing the inspection and leaving the premises;

(ii) When the employer or a knowledgeable source such as the complainant or referring party submits in writing that compliance has been achieved.

(4) Monitoring inspections. A monitoring inspection may be conducted for any reason including:

(a) An employer's request for a variance; or

(b) An employer's request for an extension of an abatement date.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-03-011 (Order 86-48), § 296-27-16022, filed 1/12/87.]

WAC 296-27-16023 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-27-16026 Programmed inspections. A programmed inspection generally is a comprehensive inspection of the worksite but may be a partial inspection if required by resource availability or other enforcement priorities. A programmed inspection shall be scheduled pursuant to one of the following general scheduling systems unless the establishment is within a "high hazard" industry.

(1) General scheduling system. The state-wide general scheduling system is not specific to any individual industry. Both safety and health general scheduling systems include the following factors:

(a) An objective criteria which includes but is not limited to one or more of the following:

(i) Available data concerning injuries or illnesses which could be reduced by an inspection which eliminates the hazards;

(ii) The industrial insurance modification factor of a particular business establishment;

(iii) The number or type of contaminants present at a worksite as well as the relative toxicity of those contaminants;

(iv) The degree of exposure to hazards;

(v) The number of employees exposed.

(b) A random selection process which utilizes a computer program to ensure statistical randomness;

(c) A regular evaluation and review including:

(i) A yearly analytical review comparing the current program with the objective criteria;

(ii) An annual comparison between compiled inspection results and reported injuries or illnesses.

(d) A general scheduling system programmed for no more than a twelve-month operating cycle with a maximum permissible extension of no more than one month before appropriate adjustments are implemented.

(2) Special emphasis targeting system. A special emphasis targeting system is a regional and/or industry-

specific system which will be based on either one of the following:

(a) Scheduling system which includes:

(i) An objective criteria;

(ii) A random selection process;

(iii) An evaluation and review; or

(iv) An operating cycle.

(b) A scheduling program required of state plan states by the Federal Occupational Safety and Health Administration.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-03-011 (Order 86-48), § 296-27-16026, filed 1/12/87.]

Chapter 296-45 WAC

SAFETY STANDARDS—ELECTRICAL WORKERS

WAC

296-45-65025 Repealed.

296-45-65026 Personal protective grounding.

296-45-65037 Underground.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-45-65025 Grounding. [Order 76-38, § 296-45-65025, filed 12/30/76.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.

WAC 296-45-65025 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-45-65026 Personal protective grounding.

(1) Purpose.

(a) Reduce the potential voltage differences across the worker: The primary function of personal protective grounds is to provide maximum safety for personnel while they are working on de-energized lines or equipment. This will be accomplished by making provisions which will reduce the potential voltage differences at the worksite (voltage across the worker) to a safe value in case the equipment or line being worked on is accidentally energized from any possible source.

(b) Protect from induced voltage: The secondary function is also to protect against induced voltage from adjacent parallel energized lines.

(c) Insure adequate operation of protective devices: The third function is to make the protective devices (relays and circuit breakers or fuses) disconnect the energizing source within a given time/current relationship.

(2) Application.

(a) Deenergized line: When an energized line over seven hundred fifty volts is removed from service to be worked on, the line shall be treated as though it is energized until the line is cleared, tagged, tested, and grounded.

(b) Communication conductors: Bare wire communication conductors on power poles and structures are subject to these rules as energized lines and voltages in excess of seven hundred fifty volts unless protected by insulating materials.

(c) New construction: The grounding rule is advisory, rather than compulsory, when work is being done on new

construction that is known to be deenergized and it is not possible to energize the line.

(d) Minimum distance from ungrounded conductors: The minimum distance shown in Table 1 of WAC 296-45-65027(14) shall be maintained from ungrounded conductors at the work location. The ground may be omitted if the making of a ground is impractical, or the conditions resulting therefrom are more hazardous than working on the lines or equipment without grounding. However, all work must be done in accordance with this chapter as if the line or equipment is energized.

(3) Grounding equipment.

(a) Availability: Grounding equipment shall be available for use when work is being done on deenergized lines or equipment.

(b) Approved capacity: Grounding equipment shall be of approved current carrying capacity capable of accommodating the maximum fault current to which the line or equipment could be subjected.

(c) Approved connector: Grounding shall be made with an approved connector capable of conducting the available fault current.

(d) Approved ferrules and grounding clamps: Grounding jumpers shall have approved ferrules and grounding clamps that provide mechanical support for jumper cables independent of the electrical connection.

(e) Minimum conductance: A ground lead shall have a minimum conductance of #2 AWG copper.

(4) Testing prior to installation of ground. Before grounds are installed, the deenergized line or equipment shall be tested for voltage by the following approved methods:

(a) Tester testing: Approved testers (audio and/or visual) may be used; however, they shall be tested immediately before and after use to verify that the tester is in good working condition.

(b) Hot line tool testing: A deenergized line may be buzzed or tested, to insure that it is deenergized, using an approved hot line tool with a substantial piece of metal on the end.

(5) Attaching and removing ground(s).

(a) Inspection before use: Grounding equipment shall be given a visual inspection and all mechanical connections shall be checked for tightness before each use.

(b) Ground surface cleaning: The surface to which the ground is to be attached shall be clean before the grounding clamp is installed; otherwise, a self-cleaning clamp shall be used.

(c) Ground attachment procedure: When attaching ground(s), the ground end shall be firmly attached first

to a reliable ground and then the other end shall be attached to the line or equipment by means of approved hot line tools.

(d) Ground removal procedure: No ground shall be removed until all employees are clear of the temporary grounded lines or equipment. In those instances where the specific line or equipment that has been previously energized at 750 volts or more is being taken out of service or moved to another location, and it has been identified, isolated, tested and grounded, and the safe distances provided in Table 1 are maintained or barriers are installed to protect against contact with energized sources, and it is no longer possible to energize the line or equipment from any source, the grounds may be removed and the line or equipment may be removed from service or moved to another location. When removing the grounding set, it shall be disconnected from the line or equipment first with an approved hot line tool and lowered to a point below all energized conductors before the ground end is disconnected.

(6) Selection of ground location. Attached grounds: Ground(s) attached to each conductor being worked on are adequate when connected in a manner that will reduce the potential voltage difference across the worksite to a safe level. See examples: Figures A, B, and C.

(7) Testing without ground(s): Ground(s) may be temporarily removed when necessary for testing purposes. During a test procedure, with ground(s) removed, care shall be exercised.

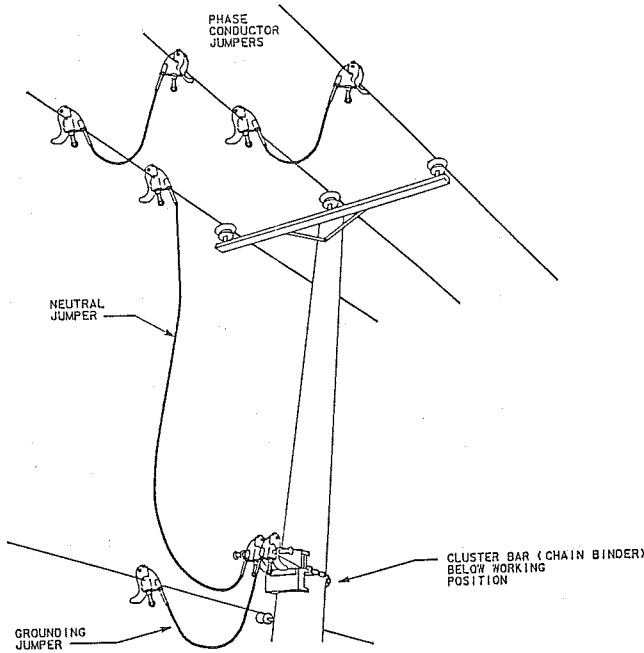
(8) Conductor separation: In cases where the conductor separation at any pole or structure is so great as to make it impractical to apply shorts on all conductors, and where only one conductor is to be worked on, only that conductor which is to be worked on needs to be grounded.

(9) Ground personnel: In cases where ground rods or pole grounds are utilized for personal protective grounding, personnel working on the ground should maintain sufficient distance from such equipment or utilize other approved procedures designed to prevent "touch-and-step potential" hazards.

Note: Touch potential hazards refers to the difference in voltage measured between the grounding equipment and a worker in contact with the grounding equipment at the time it is accidentally energized. Step potential hazards refers to the difference in voltage measured between the feet of the worker standing or walking in an electrical field created by high voltage being brought to earth.

EXAMPLE OF
INSTALLATION OF PERSONAL PROTECTIVE GROUNDS
ON OVERHEAD LINES

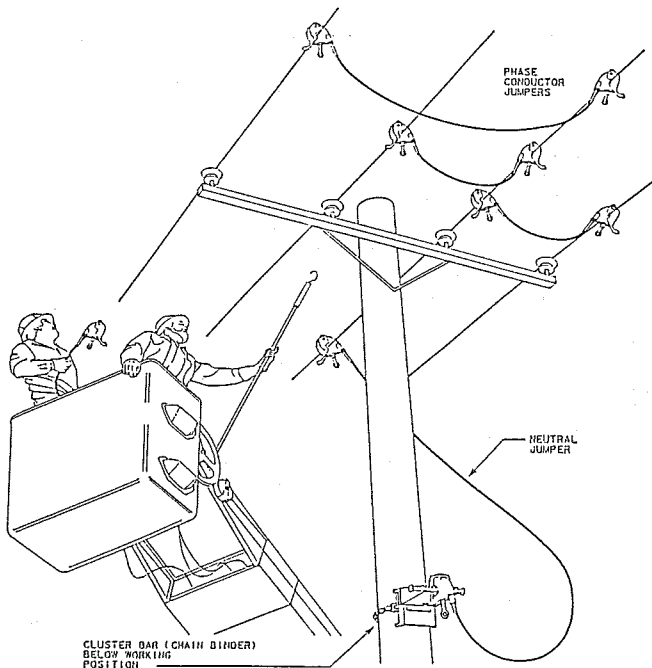
FIGURE A



DISTRIBUTION LINE WITH COMMON NEUTRAL

EXAMPLE OF
INSTALLATION OF PERSONAL PROTECTIVE GROUNDS
ON OVERHEAD LINES

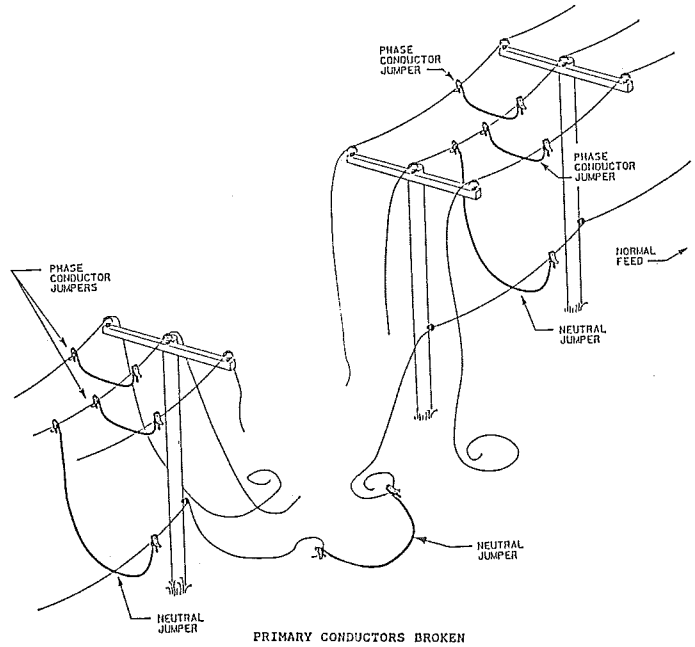
FIGURE B



DISTRIBUTION LINE WITH PRIMARY NEUTRAL

EXAMPLE OF
INSTALLATION OF PERSONAL PROTECTIVE GROUNDS
ON OVERHEAD LINES

FIGURE C



[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-45-65026, filed 5/11/88.]

WAC 296-45-65037 Underground. (1) Protective barriers, or approved guards and warning signs must be erected before removing manhole covers or making excavations in places accessible to vehicular or pedestrian traffic.

(2) Whenever an opening is made in the street, it shall be properly guarded or covered until same is closed and whenever an obstruction is left in the roadway after dark, it shall be marked with approved lights, flares or similar devices.

(3) When work is to be performed in a manhole or unvented vault:

(i) No entry shall be permitted unless forced ventilation is provided or the atmosphere is found to be safe by testing for oxygen deficiency and the presence of explosive or potentially hazardous gases or fumes.

(ii) When unsafe conditions are detected, by testing or other means, the work area shall be ventilated and otherwise made safe before entry.

(iii) Provisions shall be made for a continuous supply of air as provided for in WAC 296-62-110.

(iv) When forced ventilation is not used a method of monitoring said manhole or vault so as to prevent the occurrence of oxygen deficiency due to work being performed in said manhole or vault, and to detect the presence of any explosive gases or fumes which may occur while the employees are working in said manhole or vault.

(4) When open flames are used or smoking is permitted in manholes, adequate mechanical forced air ventilation shall be used.

(5) Before using open flames in a manhole or excavation in an area where combustible gases or liquids may be present, such as near a gasoline service station, the atmosphere of the manhole or excavation shall be tested and found safe or cleared of the combustible gases or liquids prior to the entry.

(6) When work is to be performed in manholes containing any wires or appliances carrying electrical current, they shall be in a sanitary condition.

(7) A watchman shall be kept at the surface when there is any hazard to the employees in the manhole and he should not leave the manhole unwatched until such time as all employees are out and the cover has been replaced.

(8) Care shall be taken to prevent the possibility of vehicles or pedestrians coming in contact with the wires and equipment.

(9) Trenching and excavating.

(a) During excavation or trenching, in order to prevent exposure of employees to the hazards created by damage to dangerous underground facilities, efforts shall be made to determine the location of such facilities and work conducted in a manner designed to avoid damage.

(10) No work shall be permitted to be done in any manhole or subway on any energized wire, cable or appliance carrying more than 300 volts of electricity by less than two competent or qualified persons who shall at all times, while performing such work, be in the same manhole or subway in which work is being done. This rule shall not apply to work on telephone, telegraph or signal wires or cables.

(11) Trenching and excavation operations shall comply with the provisions of WAC 296-155-650 and 296-155-660.

(12)(a) Cables in manholes shall be accessible to employees and clear working space shall be maintained at all times.

(b) Where cables are not permanently identified by tags or otherwise, diagrams and information establishing positive identification and position of the cables shall be provided and supplied to the employees.

(c) Where multiple cables exist in an excavation, cables other than the one being worked on shall be physically protected when necessary.

(d) When multiple cables exist in an excavation, the cables to be worked on shall be identified by approved testing unless its identification is obvious by reason of the distinctive appearance.

(e) Before cutting into a high voltage cable or opening a high voltage splice, the cable shall be de-energized then clearance obtained, tested and then grounded in an approved manner. The cable to be worked on shall be identified by tags or equivalent means.

(f) When working on buried cables or cables in manholes, the metallic sheath continuity shall be maintained by bonding across the opening or by equivalent means.

(13) Insulated platforms or other protective devices shall be provided when work is to be done on energized wires or equipment in manholes.

(14) Tools and materials shall not be left on the ground around or near the manhole opening where they might be pushed or otherwise fall into the hole.

(15) Furnaces shall always be placed in a secure, level position on the downhill side of the manhole to avoid spillage of hot metals or compounds into the manhole.

(16) Materials shall not be thrown into or out of manholes but shall be placed in the proper receptacle and hoisted in and out by means of a rope.

(17) Pulling underground cable. When pulling cable(s) all employees shall be made aware of the hazard of being caught in the sheaves, lashings or winch gears. All employees shall stand clear of the pulling line when the pull is begun or when the line is under tension. This rule applies to all work performed by means of a winch.

(18) Fishing conduit or ducts. When fishing conduit or ducts, it shall first be determined that the fish tape or wires will not contact any energized line or equipment.

(19) WAC 296-45-65023 on clearances and WAC 296-45-65026 on grounding shall be complied with.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-45-65037, filed 5/11/88; Order 76-38, § 296-45-65037, filed 12/30/76.]

Chapter 296-46 WAC

SAFETY STANDARDS--INSTALLING ELECTRIC WIRES AND EQUIPMENT--ADMINISTRATIVE RULES

WAC

296-46-110	Foreword.
296-46-130	Classification or definition of occupancies.
296-46-140	Plan review for educational, institutional or health care facilities and other buildings.
296-46-150	Wiring methods for designated building occupancies.
296-46-160	Service requirements.
296-46-180	Meter installation.
296-46-200	Service entrance conductors.
296-46-220	Service equipment.
296-46-240	Service mast.
296-46-316	Table headings 1987 National Electrical Code— Conductor ampacities.
296-46-350	Emergency systems.
296-46-370	Boat moorages, floating buildings, and similar installations.
296-46-420	Nonmetallic cable systems—Ground-fault circuit interrupter protection—Knob and tube wiring.
296-46-422	Water heater circuit.
296-46-495	Electrical work permits and fees.
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296-46-680	Electrical equipment associated with spas, hot tubs, swimming pools or hydromassage bathtubs.
296-46-910	Inspection fees.
296-46-920	Civil penalty.

WAC 296-46-110 Foreword. The 1987 edition of the National Electrical Code (NFPA 70-1987) is hereby adopted by reference as part of this chapter. Other codes, manuals, and reference works referred to in this chapter are available for inspection and review in the

Olympia office of the electrical section of the department during business hours. Where there is any conflict between this chapter and the National Electrical Code, the requirements of this chapter shall be observed.

Electrical inspectors will give information as to the meaning or application of the National Electrical Code and this chapter, but will not lay out work or act as consultants for contractors, owners, or users.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 87-10-030 (Order 87-07), § 296-46-110, filed 5/1/87. Statutory Authority: RCW 19.28.010 and 19.28.060. 84-15-051 (Order 84-10), § 296-46-110, filed 7/17/84. Statutory Authority: RCW 19.28.060. 81-06-037 (Order 81-5), § 296-46-110, filed 2/27/81, effective 4/1/81; 78-02-098 (Order 77-31), § 296-46-110, filed 1/31/78; Order 74-43, § 296-46-110, filed 12/19/74; Order 72-7, § 296-46-110, filed 6/7/72; Order 69-2, § 296-46-110, filed 2/28/69, effective 4/1/69.]

WAC 296-46-130 Classification or definition of occupancies. (1) Educational facility refers to a building or portion of a building used primarily for educational purposes and shall include buildings used for the gathering of groups of six or more persons for purposes of instruction. Educational occupancy includes, but is not restricted to: Schools, colleges, academies, universities and child day care facilities.

(2) Institutional facility refers to a building or portion of a building used primarily for detention and correctional occupancies where some degree of restraint or security is required. Such occupancies shall include, but are not restricted to: Penal institutions, reformatories, jails, detention centers, correctional centers, and residential-restrained care.

(3) Health or personal care facility. Health or personal care facility refers to buildings or parts of buildings that contain but are not limited to facilities such as a hospital, nursing home, alcoholism hospital, psychiatric hospital, boarding home, alcoholism treatment facility, maternity home, birth center or childbirth center, residential treatment facility for psychiatrically impaired children and youths, and renal hemodialysis clinics which are licensed by the department of social and health services; and medical, dental or chiropractic offices or clinics, outpatient or ambulatory surgical clinics, and such other health care occupancies where patients who may be unable to provide for their own needs and safety without the assistance of another person are treated.

(a) Boarding home means any home or other institution, however named, which is advertised, announced, or maintained for the express or implied purpose of providing board and domiciliary care to three or more aged persons not related by blood or marriage to the operator. It shall not include any home, institution, or section thereof which is otherwise licensed and regulated under the provisions of state law providing specifically for the licensing and regulation of such home, institution, or section thereof.

(b) Private alcoholism hospital means an institution, facility, building, or equivalent designed, organized, maintained, and operated to provide diagnosis, treatment, and care of individuals demonstrating signs or

symptoms of alcoholism, including the complications of associated substance use and other medical diseases that can be appropriately treated and cared for in the facility and providing accommodations, medical services, and other necessary services over a continuous period of twenty-four hours or more for two or more individuals unrelated to the operator, provided that this chapter shall not apply to any facility, agency, or other entity which shall be both owned and operated by a public or governmental body.

(c) Detoxification means care or treatment of an intoxicated person during a period where the individual recovers from the effects of intoxication.

(d) Private psychiatric hospital means an institution, facility, building, or agency specializing in the diagnosis, care, and treatment of individuals demonstrating signs and/or symptoms of mental disorder (as defined in RCW 71.05.020(2)), and providing accommodations and other necessary services over a continuous period of twenty-four hours or more for two or more individuals not related to the operator, provided that this chapter shall not apply to any facility, agency, or other entity which shall be both owned and operated by a public or governmental body.

(e) Alcoholism treatment facility means a private place or establishment, other than a licensed hospital, operated primarily for the treatment of alcoholism.

(f) Maternity home means any home, place, hospital, or institution in which facilities are maintained for the care of four or more women, not related by blood or marriage to the operator, during pregnancy or during or within ten days after delivery: Provided, however, that this definition shall not apply to any hospital approved by the American College of Surgeons, American Osteopathic Association or its successor.

(g) Birth center or childbirth center means a type of maternity home which is a house, building, or equivalent organized to provide facilities and staff to support a birth service, provided that the birth service is limited to low-risk maternal clients during the intrapartum period.

(h) Residential treatment facility for psychiatrically impaired children and youth means a residence, place, or facility designed and organized to provide twenty-four hour residential care and long-term individualized, active treatment for clients who have been diagnosed or evaluated as psychiatrically impaired.

(i) Ambulatory surgical center or ASC means any distinct entity that operates exclusively for the purpose of providing surgical services to patients not requiring hospitalization, has an agreement with HFCA under Medicare to participate as an ASC.

(j) Renal dialysis clinic is a facility in a building or part of a building which is approved to furnish the full spectrum of diagnostic, therapeutic, and rehabilitative services required for the care of renal dialysis patients (including inpatient dialysis furnished directly or under arrangement).

(k) Adult residential treatment facility means a residence, place, or facility designed and organized primarily to provide twenty-four hour residential care, crisis and short-term care, and/or long-term individualized

active treatment and rehabilitation for clients diagnosed or evaluated as psychiatrically impaired or chronically mentally ill as defined herein or in chapter 204, Laws of 1982.

(l) Private adult treatment home means a dwelling which is the residence or home of two adults providing food, shelter, beds, and care for two or fewer psychiatrically impaired clients, provided these clients are detained under chapter 71.05 RCW and the dwelling is certified as an evaluation and treatment facility under chapter 71.05 RCW.

(m) Group care facility means an agency maintained and operated for the care of a group of children on a twenty-four-hour basis.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 87-10-030 (Order 87-07), § 296-46-130, filed 5/1/87. Statutory Authority: RCW 19.28.010 and 19.28.060. 84-15-051 (Order 84-10), § 296-46-130, filed 7/17/84. Statutory Authority: RCW 19.28-.060, 81-06-037 (Order 81-5), § 296-46-130, filed 2/27/81, effective 4/1/81; Order 72-7, § 296-46-130, filed 6/7/72; Order 69-2, § 296-46-130, filed 2/28/69, effective 4/1/69.]

WAC 296-46-140 Plan review for educational, institutional or health care facilities and other buildings.

(1) All electrical plans for new or altered electrical installations in educational, institutional, and health or personal care occupancies classified or defined in WAC 296-46-130 and as indicated in WAC 296-46-150, Table 1 or 2 shall be reviewed and approved by the department before the electrical installation or alteration is begun. Plans for these electrical installations within cities which perform electrical inspections within their jurisdiction, and provide an electrical plan review program that equals or exceeds that of the department's, may be

submitted to that city for review rather than to the department. Approved plans shall be available on the job site for use during the electrical installation or alteration and for use by the electrical inspector. Refer plans for department review to the Electrical Inspection Section, Department of Labor and Industries, 805 Plum St. SE, Olympia, Washington 98504. Please refer to WAC 296-46-910 for required fees for plan review.

(2) Plans to be reviewed by the department must be legible, identify the name and classification of the facility, clearly indicate the scope and nature of the installation and the person or firm responsible for the electrical plans. The plans shall clearly show the electrical installation or alteration in floor plan view, include switchboard and/or panelboard schedules and when a service or feeder is to be installed or altered, shall include a riser diagram, load calculation, fault current calculation and interrupting rating of equipment.

(3) Plan review for new or altered electrical installations of other types of construction may be voluntarily requested by the owner or other interested parties.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 87-10-030 (Order 87-07), § 296-46-140, filed 5/1/87. Statutory Authority: RCW 19.28.010 and 19.28.060. 84-15-051 (Order 84-10), § 296-46-140, filed 7/17/84. Statutory Authority: RCW 19.28-.060, 81-06-037 (Order 81-5), § 296-46-140, filed 2/27/81, effective 4/1/81; 78-02-098 (Order 77-31), § 296-46-140, filed 1/31/78; Order 74-43, § 296-46-140, filed 12/19/74; Order 72-7, § 296-46-140, filed 6/7/72; Order 69-2, § 296-46-140, filed 2/28/69, effective 4/1/69.]

WAC 296-46-150 Wiring methods for designated building occupancies. Wiring methods, equipment and devices for health or personal care, educational and institutional facilities as defined or classified in WAC 296-46-130 and for places of assembly for one hundred or more persons shall comply with Table 1 or 2 and the notes thereto. For determining the occupant load of places of assembly, the methods of NFPA, 101-1985 Life Safety Code shall be used.

Table 1
Health or Personal Care Facilities
Electrical System—Wiring Methods

Health or Personal Care Facility	Power, Lighting, or Class 1 Circuits	General Patient Care	Critical Patient Care	Emergency Power, Lighting or Signalling	Low Voltage Systems	Special Requirements
Hospital	1,9	2	2	1	6,7	4,5,10
Nursing home	1,9	2	2	1	6,7	4,10
Boarding home more than 16 persons	1,9			1	6,7	4,10
Boarding home 16 persons or less	3			1	7,8	4,10
Alcoholism hospital	1,9	2		1	6,7	4,10
Detoxification facilities	1,9	1		1	6,7	4,10
Psychiatric hospital	1,9	1		1	6,7	4,5,10

Table 1
Health or Personal Care Facilities
Electrical System—Wiring Methods

Health or Personal Care Facility	Power, Lighting, or Class 1 Circuits	General Patient Care	Critical Patient Care	Emergency Power, Lighting or Signalling	Low Voltage Systems	Special Requirements
Alcoholism treatment facility (other than detoxification facility)	3	3		1	6,7	4,10
Maternity home	1,9	1		1	7,8	4,10
Birth or childbirth center	3	3		1	7,8	
Residential treatment facility for psychiatrically impaired children & youths	1,9	1		1	6,7	4,5,10
Medical, dental & chiropractic clinics	3	3		1	7,8	
Ambulatory surgeries & clinics	1,9	2	2	1	7,8	10
Renal hemodialysis clinics	1,9	2		1	7,8	10
Adult residential treatment facility more than 16 persons	1,9			1	6,7	4,10
Adult residential treatment facility 16 persons or less	3			1	7,8	4,10
Group care facilities for children more than 16 persons	1,9			1	6,7	4,5,10
Group care facilities for children 16 persons or less	3			1	7,8	4,5,10

Table 2
Educational Facilities, Institutional Facilities
or Places of Assembly for 100 or more persons
Electrical System—Wiring Methods

Facility	Power, Lighting or Class 1 Circuits	Emergency Power, Lighting	Low Voltage Systems	Special Requirements
Educational	1,9	1	6,7	10
Institutional	1,9	1	6,7	10
Place of assembly for 100 or more persons	1,9	1	6,7	

Table 2
Educational Facilities, Institutional Facilities
or Places of Assembly for 100 or more persons
Electrical System—Wiring Methods

Facility	Power, Lighting or Class 1 Circuits	Emergency Power, Lighting	Low Voltage Systems	Special Requirements
Licensed day care for children aged through 6 years over three story building	1,9	1	6,7	5,10
Licensed day care for children aged through 6 years - thru three story building	3	1	7,8	5

Notes for Tables 1 and 2

1. Metallic raceways.
2. Metallic raceways with an insulated equipment grounding conductor.
3. Wiring methods in accordance with the National Electrical Code.
4. Ground-fault circuit-interrupter protection of 15 or 20 ampere, 125 volt receptacles within a bathroom or shower room or within five feet of a basin which is located in a patient room.
5. Tamperproof receptacles in licensed day care facilities and pediatric or psychiatric patient care areas for 15 or 20 ampere, 125 volt receptacles. Tamperproof receptacles shall, by construction, limit improper access to energized contacts.
6. Fire alarm, nurse call, public address systems used to give directions during an emergency situation or other emergency systems shall be installed in a metallic raceway.
7. Class 2 or 3 limited energy systems and communication systems including telephone, intercom, data processing or similar systems shall be permitted to be installed as open cable systems in compliance with the National Electrical Code.
8. Fire alarm systems shall be permitted to be installed as open cable systems in compliance with the National Electrical Code.
9. Rigid nonmetallic raceways shall be permitted to be installed outside of buildings, in the earth or in concrete on or below grade.
10. Plan review required.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 87-10-030 (Order 87-07), § 296-46-150, filed 5/1/87. Statutory Authority: RCW 19.28.010 and 19.28.060. 84-15-051 (Order 84-10), § 296-46-150, filed 7/17/84. Statutory Authority: RCW 19.28.060. 81-06-037 (Order 81-5), § 296-46-150, filed 2/27/81, effective 4/1/81; 78-02-098 (Order 77-31), § 296-46-150, filed 1/31/78; Order 75-25, § 296-46-150, filed 8/4/75; Order 74-43, § 296-46-150, filed 12/19/74; Order 72-7, § 296-46-150, filed 6/7/72; Order 69-2, § 296-46-150, filed 2/28/69, effective 4/1/69.]

WAC 296-46-160 Service requirements. (1) The serving utility shall be consulted by the owner, the owner's agent, or the contractor making the installation

regarding the service entrance location and meter equipment requirements before installing the service and equipment. Provisions for a meter and related equipment, an attachment of a service drop, or an underground service lateral shall be made at a location acceptable to the serving utility. The point of attachment for a service drop must permit the clearances required by the National Electrical Code.

(2) A fire wall shall have a minimum two-hour rating as defined by the Uniform Building Code to be considered a building separation in accordance with Article 100 of the National Electrical Code.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 87-10-030 (Order 87-07), § 296-46-160, filed 5/1/87. Statutory Authority: RCW 19.28.010 and 19.28.060. 84-15-051 (Order 84-10), § 296-46-160, filed 7/17/84; Order 69-2, § 296-46-160, filed 2/28/69, effective 4/1/69.]

WAC 296-46-180 Meter installation. Except as otherwise permitted by the serving utility, the height of the center of the service meter shall not be more than 7 feet or less than 5 feet above finished grade or the floor below the meter. Secondary instrument transformer conductors for metering shall not be permitted in the service raceway.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 87-10-030 (Order 87-07), § 296-46-180, filed 5/1/87. Statutory Authority: RCW 19.28.010 and 19.28.060. 84-15-051 (Order 84-10), § 296-46-180, filed 7/17/84; Order 74-43, § 296-46-180, filed 12/19/74; Order 69-2, § 296-46-180, filed 2/28/69, effective 4/1/69.]

WAC 296-46-200 Service entrance conductors. (1) Service entrance conductors shall extend at least 18 inches from the service head to permit connection to the service drop.

(2)(a) Service conductors for 600 volts, nominal, or less within a building or structure shall be limited to the following methods: Galvanized rigid metal conduit; galvanized intermediate metal conduit; wireways; busways; auxiliary gutters; rigid nonmetallic conduit; cablebus; or mineral-insulated, metal-sheathed cable (type MI).

(b) Service conductors exceeding 600 volts, nominal, within a building or structure shall be limited to the following methods: Galvanized rigid metal conduit; galvanized intermediate metal conduit; open runs of metal-clad cable; cablebus; or busways.

(3) Service conductors under the exclusive control of the serving utility, when installed within a building or structure shall be installed in rigid steel galvanized conduit or Schedule 80 nonmetallic conduit. The grounded service conductor may be identified with a yellow jacket.

(4) The service raceway or cable shall extend no more than fifteen feet inside a building or structure.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 87-10-030 (Order 87-07), § 296-46-200, filed 5/1/87. Statutory Authority: RCW 19.28.010 and 19.28.060. 84-15-051 (Order 84-10), § 296-46-200, filed 7/17/84. Statutory Authority: RCW 19.28.060. 78-02-098 (Order 77-31), § 296-46-200, filed 1/31/78; Order 74-43, § 296-46-200, filed 12/19/74; Order 73-7, § 296-46-200, filed 5/17/73; Order 69-2, § 296-46-200, filed 2/28/69, effective 4/1/69.]

WAC 296-46-220 Service equipment. (1) Service equipment, sub-panels, and similar electrical equipment shall be installed so that they are readily accessible and shall not be installed in bathrooms, clothes closets, shower rooms, cupboards, or attics, or above washers, clothes dryers, or plumbed-in fixtures. All indoor service equipment and sub-panel equipment shall be adequately illuminated.

(2) Service switches and other equipment exposed to elements of the outside weather shall be rain tight type factory built for the purpose. Refer to NEMA-3R.

(3) Temporary construction service equipment shall not be used for other than construction purposes and shall be disconnected when the permanent service is connected unless an extension for a definite period of time is granted by the department.

(4) Multiple-occupancy buildings. A second or additional underground service lateral to a multiple-occupancy building shall be permitted to be installed at a location separate from other service laterals to the building provided that all the following conditions are complied with:

(a) Each service lateral is sized in accordance with the National Electrical Code for the calculated load to be served by the conductors;

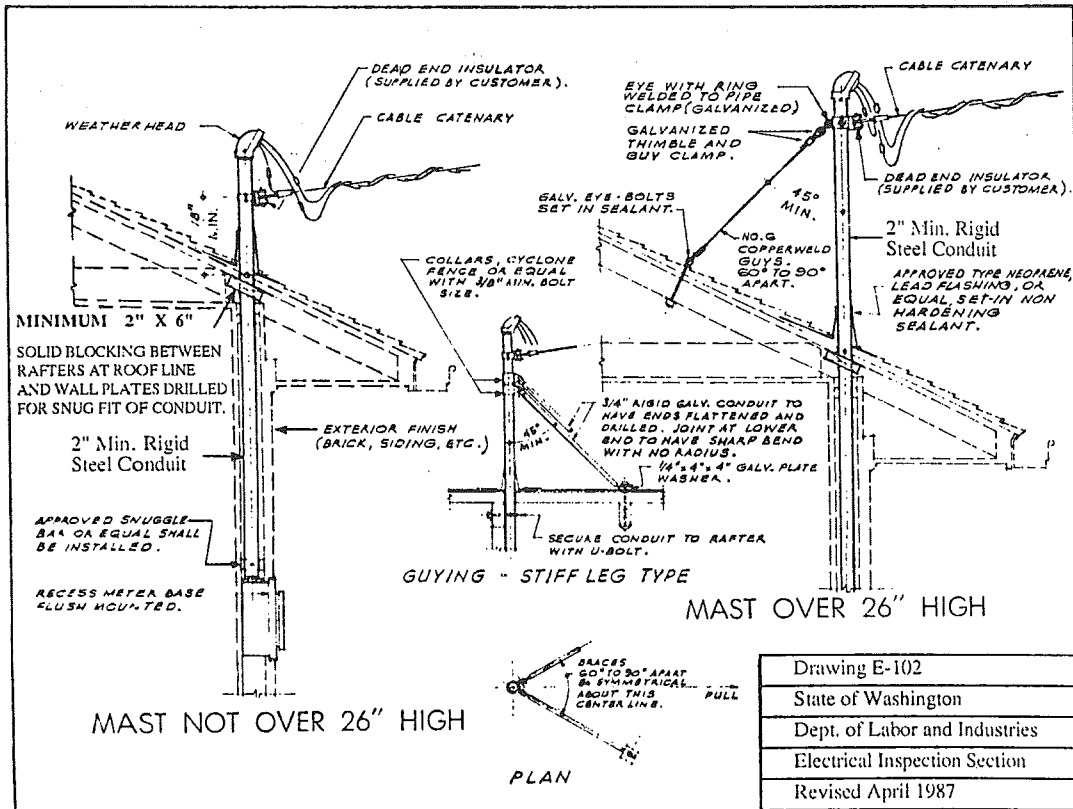
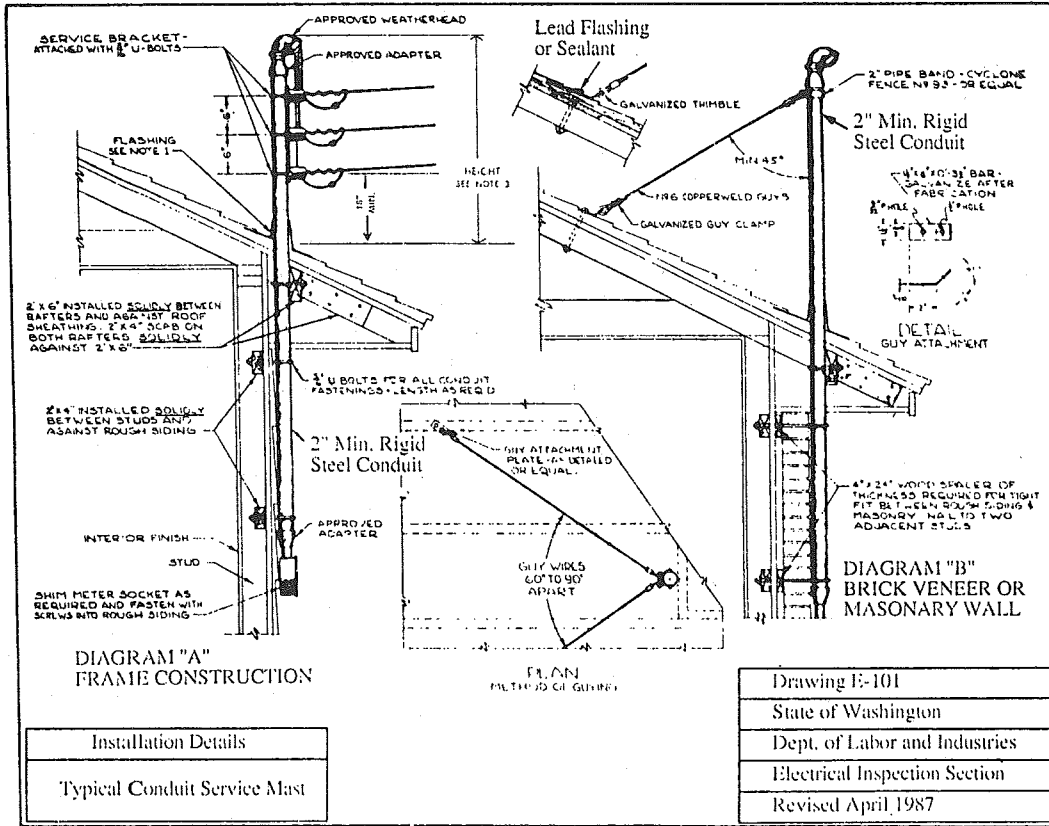
(b) Each service lateral terminates in service equipment which is located in or on a unit served by the service equipment;

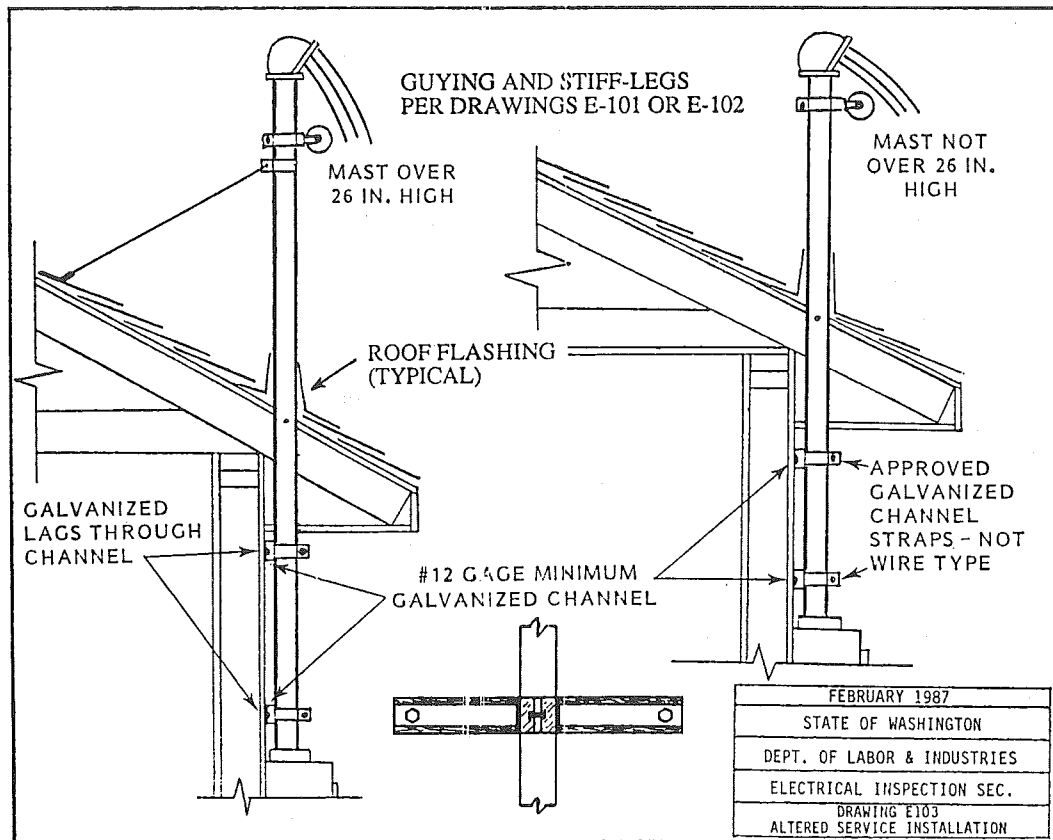
(c) The service equipment is separated at least fifteen feet from other service equipment in or on the building; and

(d) A permanent directory, suitable for the environment, is placed at each service equipment location which identifies all other service equipment locations in or on the building.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 87-10-030 (Order 87-07), § 296-46-220, filed 5/1/87. Statutory Authority: RCW 19.28.010 and 19.28.060. 84-15-051 (Order 84-10), § 296-46-220, filed 7/17/84. Statutory Authority: RCW 19.28.060. 78-02-098 (Order 77-31), § 296-46-220, filed 1/31/78; Order 72-7, § 296-46-220, filed 6/7/72; Order 69-2, § 296-46-220, filed 2/28/69, effective 4/1/69.]

WAC 296-46-240 Service mast. A service entrance conduit extended through the roof to provide a means of attaching the service drop shall be no smaller than 2-inch rigid steel galvanized conduit. The service mast shall provide a structurally sound attachment for the service drop and shall be equipped with a properly installed flashing at the roof line. The installation shall comply with drawings E-101 and E-102, or shall provide equivalent strength by other approved means.





Notes to drawings E-101, E-102, and E-103.

1. An approved roof flashing shall be installed on each mast which passes through a roof. Plastic, nonhardening mastic shall be placed between lead-type flashings and the conduit. Neoprene type flashings shall also be permitted to be used.
2. A service mast may be installed inside or outside the building lines provided that the mast is braced, secured and supported in such a manner that no pressure from the service drop will be exerted on a roof flashing or meter base.
3. Utilization of couplings in a service mast are permitted only below the point the mast is braced, secured or supported.
4. Except as otherwise required by the serving utility, service mast support guys shall be installed if the service drop attaches to the mast more than 24 inches above the roof line or if the service drop is greater than 100 feet.
5. Intermediate support masts shall be installed in an approved manner with methods identical or equal to those required for service masts.
6. For altered services, when it is impractical to install U bolt mast supports due to interior walls remaining closed, it shall be permissible to use other alternate mast support methods such as heavy gauge, galvanized, electrical channel material which is secured to two or more wooden studs with 5/16 inch diameter or larger galvanized lag bolts.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 87-10-030 (Order 87-07), § 296-46-240, filed 5/1/87. Statutory Authority: RCW 19.28.010 and 19.28.060. 84-15-051 (Order 84-10), § 296-46-240, filed 7/17/84; Order 69-2, § 296-46-240, filed 2/28/69, effective 4/1/69.]

WAC 296-46-316 Table headings 1987 National Electrical Code--Conductor ampacities. (1) The heading of Table 310-16 of the 1987 National Electrical Code is hereby revised to read as follows: "Table 310-16. Ampacities of not more than three single insulated conductors, rated 0 through 2000 volts, in raceway and ampacities of cable types AC, NM, NMC, and SE. Based on ambient air temperature of 30° C (86° F)."

(2) The heading of Table 310-18 of the 1987 National Electrical Code is hereby revised to read as follows: "Table 310-18. Ampacities of three single insulated conductors, rated 0 through 2000 volts 110° to 250° C in raceway. Based on ambient air temperature of 40° C (104° F)."

(3) The heading of Table 310-22 of the 1987 National Electrical Code is hereby revised to read as follows: "Table 310-22. Ampacities of three insulated conductors, rated 0 through 2000 volts within an overall covering (three conductor cable) in raceway. Based on ambient air temperature of 30° C (86° F)."

(4) Table 310-16 and all accompanying notes of the 1987 National Electrical Code shall be permitted to be used to determine the ampacity of from one through six sets of underground conductors rated 0 through 2000

volts that are directly buried or installed in underground ducts if all the following conditions are complied with:

(a) The load is calculated in accordance with Article 220 of the National Electrical Code.

(b) At least two inches spacing is maintained between ducts or conductor sets.

(c) Select fill is used to backfill around conductor sets or ducts to avoid air gaps. Concrete encasement around approved ducts is acceptable.

(d) Maximum burial depth to the top of duct banks shall be thirty inches, and maximum depth to the top of direct buried cable shall be thirty-six inches.

(e) The load factor does not exceed seventy percent.

Load factor is defined as "the ratio of the average load to the peak load occurring during a twenty-four hour period." Where the load factor exceeds seventy percent, the conductor ampacity from Table 310-16 shall be reduced by the amount the load factor exceeds seventy percent. (For example, if the load factor is eighty-five percent, reduce the ampacity by fifteen percent.)

The ampacity of conductors installed under conditions or in configurations other than indicated above shall be determined in accordance with section 310-15(b) of the National Electrical Code.

[Statutory Authority: RCW 19.28.060, 88-15-063 (Order 88-14), § 296-46-316, filed 7/18/88. Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW, 87-10-030 (Order 87-07), § 296-46-316, filed 5/1/87.]

WAC 296-46-350 Emergency systems. (1) Exit and emergency lights shall be installed in accordance with the National Electrical Code, Article 700, and Life Safety Code NFPA 101-1985 in all health or personal care facilities defined in WAC 296-46-130, educational facilities, institutional facilities, hotels, motels, and places of assembly for one hundred or more persons. Installation shall be made in strict accordance with the National Electrical Code, Article 700, and WAC 296-46-150.

(2) Fire alarm systems. Fire alarm systems required by a city, county, or state ordinance, statute, or regulation shall be installed in accordance with the National Electrical Code and this chapter. Power-limited fire alarm systems shall be permitted to be installed in metallic raceways using conductors shown in section 760-16(b) of the National Electrical Code for nonpower-limited circuits or those 600 volt conductors which are rated for 90° C or greater in Table 310-13 of the National Electrical Code.

(3) Junction boxes for fire alarm systems other than the surface raceway type, shall be substantially red in color. Power-limited fire protective signalling circuit conductors shall be durably and plainly marked in or on junction boxes or other enclosures to indicate that it is a power-limited fire protective signalling circuit. Conductors for light, heat, or power shall not be installed in any enclosure, raceway, cable, compartment, outlet box, or similar fitting containing fire alarm conductors.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW, 87-10-030 (Order 87-07), § 296-46-350, filed 5/1/87. Statutory Authority: RCW 19.28.010 and 19.28.060, 84-15-051 (Order 84-

10), § 296-46-350, filed 7/17/84. Statutory Authority: RCW 19.28.060, 81-06-037 (Order 81-5), § 296-46-350, filed 2/27/81, effective 4/1/81; 78-02-098 (Order 77-31), § 296-46-350, filed 1/31/78; Order 72-7, § 296-46-350, filed 6/7/72; Order 69-2, § 296-46-350, filed 2/28/69, effective 4/1/69.]

WAC 296-46-370 Boat moorages, floating buildings, and similar installations. Docks, wharves, boat moorages, floating buildings, and similar facilities in addition to complying with the appropriate sections of Article 553 or Article 555 of the National Electrical Code shall have a service disconnect located on the shoreline.

Where shore power is provided, each floating building or boat moorage berth shall have a disconnecting means located within sight of and not more than fifty feet from each floating building or berth. The disconnecting means shall be installed adjacent to but not in or on the floating building. Conductors in excess of 600 volts, nominal shall not be installed on floating portions of marinas, docks, or wharves. Refer to the Fire Protection Standard for Marinas and Boatyards, NFPA 303 for additional information.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW, 87-10-030 (Order 87-07), § 296-46-370, filed 5/1/87. Statutory Authority: RCW 19.28.010 and 19.28.060, 84-15-051 (Order 84-10), § 296-46-370, filed 7/17/84; Order 75-25, § 296-46-370, filed 8/4/75; Order 72-7, § 296-46-370, filed 6/7/72; Order 69-2, § 296-46-370, filed 2/28/69, effective 4/1/69.]

WAC 296-46-420 Nonmetallic cable systems--Ground-fault circuit interrupter protection--Knob and tube wiring. (1) All electrical equipment grounding conductors for nonmetallic cable systems shall be completely made up at the time of the inspection.

(2) For the purposes of section 336-4(a) of the National Electrical Code, the first floor of a building shall be defined as that floor which is intended or used for human occupancy or habitation and which has fifty percent or more of the exterior wall area level with or above finished grade. Floor levels which are designed or used only for vehicle parking, storage, or similar uses shall not be considered a floor for human occupancy or habitation.

(3) All 125 volt, single phase, 15 and 20 ampere receptacles installed outdoors at a dwelling shall have ground-fault circuit-interrupter protection for personnel.

All 125 volt, single phase, 15 and 20 ampere receptacles installed in kitchens in a dwelling unit on the small appliance branch circuits, except for those receptacle outlets for dedicated use, such as for a dishwasher, disposal, trash compactor, refrigerator or freezer, shall have ground-fault circuit-interrupter protection for personnel.

(4) The provision of section 324-4 of the National Electrical Code shall not be construed to prohibit the installation of loose or rolled thermal insulating material in spaces containing existing knob-and-tube wiring provided that all the following conditions are met:

(a) The wiring shall be surveyed by an appropriately licensed electrical contractor who shall certify that the wiring is in good condition with no evidence of improper overcurrent protection, conductor insulation failure or

deterioration, and with no improper connections or splices. Repairs, alterations or extensions of or to the electrical system shall be inspected by an electrical inspector as defined in RCW 19.28.070.

(b) The insulation shall meet Class I specifications as identified in the Uniform Building Code, with a flame spread factor of twenty-five or less as tested using ASTM E84-81a. Foam insulation shall not be used with knob-and-tube wiring.

(c) All knob-and-tube circuits shall have overcurrent protection in compliance with the 60°C column of Table 310-16 of the National Electrical Code. Overcurrent protection shall be either circuit breakers or Type S fuses. The Type S fuse adapters shall not accept a fuse of an ampacity greater than that permitted in this chapter.

[Statutory Authority: RCW 19.28.060, 88-15-063 (Order 88-14), § 296-46-420, filed 7/18/88. Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 87-10-030 (Order 87-07), § 296-46-420, filed 5/1/87. Statutory Authority: RCW 19.28.010 and 19.28.060, 84-15-051 (Order 84-10), § 296-46-420, filed 7/17/84; Order 69-2, § 296-46-420, filed 2/28/69, effective 4/1/69.]

WAC 296-46-422 Water heater circuit. Branch circuit conductors and overcurrent devices shall be rated at least one hundred twenty-five percent of the circuit load. Water heaters which have a rated circuit load in excess of 3,500 watts at 240 volts shall be provided with branch circuit conductors not smaller than No. 10 AWG copper or equal.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 87-10-030 (Order 87-07), § 296-46-422, filed 5/1/87.]

WAC 296-46-495 Electrical work permits and fees. Inspections shall not be made nor services connected unless an electrical work permit is completely and legibly filled out and readily available. The classification or type of facility to be inspected and the scope of the electrical work to be performed shall be clearly shown on the electrical work permit. The address where the inspection is to be made shall be identifiable from the street, road or highway which serves the premises.

Except for emergency repairs to existing electrical systems, electrical work permits shall be obtained prior to beginning the installation or alteration. Electrical work permits shall expire one year after the date of purchase unless electrical work is actively and consistently in progress. Electrical work permits for temporary construction activity shall expire ninety days after suspended construction and no later than one year after purchase. Fees shall be paid in accordance with the inspection fee schedule WAC 296-46-910.

Each electrical work permit shall be signed by the electrical contractor's administrator (or designee) or the person, firm, partnership, corporation, or other entity who or which is performing the electrical installation or alteration.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 87-10-030 (Order 87-07), § 296-46-495, filed 5/1/87. Statutory Authority: RCW 19.28.060 and 19.28.210, 85-20-065 (Order 85-16), § 296-46-495, filed 9/27/85. Statutory Authority: RCW 19.28.060, 78-02-098 (Order 77-31), § 296-46-495, filed 1/31/78.]

WAC 296-46-514 Service stations. In addition to complying with Article 514 of the National Electrical Code, each circuit leading to or through a gasoline pump shall be provided with an emergency disconnect switch or other approved means which shall simultaneously disconnect all circuit conductors including the grounded circuit conductor if any.

The disconnecting means or operator shall be substantially red in color and identified with a sign as the emergency disconnecting means. The disconnecting means or operator shall be readily accessible and shall be located outdoors and within sight of the gasoline pump or dispenser the disconnect controls. For multicircuit installations an electrically held contactor shall be permitted to be used.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 87-10-030 (Order 87-07), § 296-46-514, filed 5/1/87.]

WAC 296-46-680 Electrical equipment associated with spas, hot tubs, swimming pools or hydromassage bathtubs. (1) Electrical installations. In addition to complying with the statute, the National Electrical Code, and this chapter, the installation shall comply with electrical testing laboratory standards applicable to the specific equipment or installation.

(2) Package spa or hot tubs. Electrical heating, pumping, filtering, and/or control equipment installed within five feet of a spa or hot tub shall be listed as a package with the spa or hot tub.

(3) Skid packs. A factory assembly of electrical heating, pumping, filtering, and/or control equipment (skid pack) which shall be installed more than five feet from a spa or hot tub and shall be listed as a package unit.

(4) Field assembly of listed electrical equipment for a spa, hot tub, or swim spa. Field installed, listed electrical equipment (as distinguished from recognized components) for a hot tub, spa, or swim spa shall be permitted to be located at least five feet from the hot tub, spa or swim spa, provided that:

(a) The heater is listed as a "spa heater or swimming pool heater"; and

(b) The pump is listed as a "spa pump" or "swimming pool/spa pump" (the pump may be combined with a filter assembly); and

(c) Other listed equipment such as panelboards, conduit, and wire are suitable for the environment and comply with the applicable codes.

(5) Field assembly of listed electrical equipment for swimming pools. Field installed, listed electrical equipment (as distinguished from recognized components) for a swimming pool shall be permitted to be located at least five feet from the swimming pool provided that:

(a) The heater is listed as a "swimming pool heater or a spa heater"; and

(b) The pump is listed as a "swimming pool pump" or "spa pump" or "swimming pool/spa pump"; and

(c) Other equipment such as panelboards, conduit, and wire are suitable for the environment and comply with the applicable codes.

(6) Hydromassage bathtubs. Hydromassage bathtubs shall be either:

(a) Listed as a unit and bear a listing mark which will read "hydromassage bathtub"; or

(b) Be equipped with a listed "swimming pool pump," "spa pump," or "swimming pool/spa pump" and in addition, show evidence of having received approval from the department for the owners/installation instruction manual, brochures, and/or wiring diagrams.

(7) Manufacturers instructions shall be followed as a part of the listing requirements.

The field assembly or installation of "recognized components" shall not be permitted.

The five foot separation of electrical components may be reduced by the installation of a permanent barrier, such as a solid wall, fixed glass windows or doors, etc. The five foot separation will be determined by the shortest path or route that a cord can travel from the spa, hot tub, swim spa, or swimming pool to an object.

(8) Replacement of electrical equipment. Electrical components which have failed and require replacement shall be replaced with identical products unless the replacement part is no longer available, in which case, a similar product may be substituted provided that the electrical characteristics are identical and that the mechanical and grounding integrity of the equipment is maintained. Recognized components or listed equipment will be permitted to be replaced in kind. Cut-away type display models will not be expected to bear a listing mark and shall not be sold for other than display purposes.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 87-10-030 (Order 87-07), § 296-46-680, filed 5/1/87; 86-18-041 (Order 86-23), § 296-46-680, filed 8/29/86.]

WAC 296-46-910 Inspection fees. To calculate the inspection fees, the amperage is based on the larger of the conductor ampacity or the over current device.

(1) The fee for inspection of the installation, alteration, or maintenance of the following service(s), or feeder(s), is:

	Residential Services Column A	Commercial/ Industrial Column B	Additional Feeders in Commercial/ Industrial Column C
1 - 100 AMP -	\$ 30	\$ 40	\$ 10
101 - 200 AMP -	\$ 40	\$ 60	\$ 15
201 - 400 AMP -	\$ 55	\$100	\$ 25
401 - 600 AMP -	\$ 70	\$140	\$ 35
601 - 1000 AMP -	\$ 85	\$180	\$ 45
1001 - Over AMP -	\$100	\$220	\$ 55
Two family dwelling	\$ 50		
Temporary Construction Service	\$ 25		

No additional fee for inspection of branch circuits when included on the service/feeder permit.

- Column A - Residential
 - Single family residential services.
 - Multi family residential services.

- Column B - Commercial and industrial
 - Each service or the first feeder when the service is not being installed, increased or altered.
 - Feeders that terminate in a separate building.
 - Secondaries of transformers that have a capacity greater than 600 VA.
 - Each service or feeder that is over 600 volts.

- Column C - Additional feeders in commercial and industrial facilities
 - Each feeder inspected with a service or feeder in Column B at the same time and on the same permit.

(2) The following fees shall be provided for the inspection of each of the following units:

	Single/first Unit Column A	Additional Units Column B
a. Mobile home, modular home, or commercial coach service. (200 Amp. Max.)	25	5*
b. Mobile home feeder.	25	5*
c. Each lot for a recreational vehicle.	25	5
d. Berth at a marina or dock.	25	5
e. Yard pole meter loops or similar isolated metering installations.	25	5
f. Outbuilding(s) on residential property	25	5
g. Motors 10 HP or larger	25	5
h. Multi-family dwelling feeders	25	5
i. Signs	25	5
j. Low voltage temperature control circuits per building story or system	25	5

Column A The fee for inspection of a single unit or the first of several units when a service or feeder in (1)(A) or (1)(B) is not installed.

Column B The fee for inspection of additional units when they are inspected at the same time, at the same location and on the same permit as a unit in Column (1)(A), (1)(B), or (2)(A).

*Total fee for inspection of one service and feeder for a mobile home when they are inspected at the same time is \$30.00.

The above fees are in addition to master meter, mobile home park, recreational vehicle park, marina shore services and/or the main service(s).

(3) The fee for new circuits, circuit extensions, and circuit alterations where the service or feeder is not modified, shall be \$25 for one to four circuits inspected at the same time on the same premises under a single permit plus \$1 for each additional circuit. The total fee shall be no greater than the fee for a new service of like ampacity.

(4) Low voltage systems. The fee for inspection of residential, burglar or fire alarm systems, and other Class 2, low voltage systems shall be \$25. For commercial or industrial, Class 2, low voltage system installations, the minimum fee shall be \$25 for the control panel

and up to four circuits or zones plus \$5 for each additional circuit (zone).

(5) In addition to the service and feeder installation fees, the fee for inspecting each electrically driven irrigation machine is \$50 including tower and drive motors.

(6) The fee for emergency, standby, and resource recovery generators up to 50 KVA is \$25. The fee for a generator installation larger than 50 KVA, or that is the main source of power, is that for the applicable service in subsection (1) of this section.

(7) A firm, corporation or other entity which has a regularly employed electrical maintenance staff which is exempted from the requirement to have an electrician certificate of competency by RCW 19.28.610, may choose to purchase an annual electrical work permit rather than a work permit for each installation or alteration in accordance with this section. The following fee will entitle the purchaser to the number of inspections shown for a one year period after the date of purchase of an electrical work permit.

	FEE	INSPECTIONS
1 thru 3 plant electricians	\$1,300 per year	12
4 thru 6 plant electricians	\$2,600 per year	24
7 thru 12 plant electricians	\$3,900 per year	36
13 thru 25 plant electricians	\$5,200 per year	52
more than 25 plant electricians	\$6,500 per year	52

(8) Fees for carnival electrical inspections.

a. Preseason inspection, \$40 per hour.

b. The first field inspection of each ride, concession, or generator which has not had a preseason inspection shall be \$10.

c. For subsequent inspections, the fee shall be \$40 for the first ten rides, concessions, or generators, and \$2 each for all additional rides, concessions, and generators. If a ride, concession, or generator has no insignia of inspection for the calendar year, the fee for that ride, concession, or generator shall be that charged in b. of this subsection.

(9) Trip fees. A fee of \$25 shall be paid before approval of the installation if the following services are necessary:

a. Requests to inspect existing installations. After the first one half hour, an additional \$25 fee shall be provided for each one half hour of inspection time.

b. Trips to inspect when the permit submitter has given notice to the inspector that the work is ready for inspection when it is not.

c. An additional inspection trip is necessary because the submitter has given an erroneous or incomplete address.

d. More than one additional inspection trip per permit to inspect corrections required by the inspector as a result of carelessness or neglect, or for improperly responding to a corrective notice.

e. Each trip necessary to remove a noncompliance citation from the jobsite, posted because unlicensed electrical contractors or uncertified electricians or trainees were working on the jobsite.

f. When corrections have not been made in the prescribed time, unless an exception has been requested and granted.

(10) Double fees. A double inspection fee shall be charged for:

a. Installations that are covered or concealed before inspection;

b. Failure to obtain the electrical work permit prior to beginning the installation or alteration. Exception - emergency repairs to existing electrical systems.

(11) On jobs requiring partial or progress inspections, "one" inspection of one half hour duration is allowed per \$25 of fee.

(12) The fee for a plan review request pursuant to WAC 296-46-140 (1) and (2) is thirty-five percent of the electrical work permit fee as determined by WAC 296-46-495, plus a fee of \$35. The fee for review of electrical plans voluntarily requested pursuant to WAC 296-46-140(4) and for supplemental submissions of plans is \$30 per hour or a fraction of an hour.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 87-10-030 (Order 87-07), § 296-46-910, filed 5/1/87. Statutory Authority: RCW 19.28.060 and 19.28.210. 85-20-065 (Order 85-16), § 296-46-910, filed 9/27/85. Statutory Authority: RCW 19.28.210. 83-16-058 (Order 83-20), § 296-46-910, filed 8/2/83. Statutory Authority: RCW 19.28.060 and 19.28.210. 82-18-036 (Order 82-29), § 296-46-910, filed 8/26/82. Statutory Authority: RCW 19.28.060. 81-06-037 (Order 81-5), § 296-46-910, filed 2/27/81, effective 4/1/81; 78-02-098 (Order 77-31), § 296-46-910, filed 1/31/78.]

WAC 296-46-920 Civil penalty. A person, firm, partnership, corporation or other entity that violates a provision of chapter 19.28 RCW, chapter 296-46 or 296-401 WAC is liable for a civil penalty based upon the following schedule.

(1) Offering to perform, submitting a bid for, installing or maintaining conductors or equipment that convey or utilize electrical current without having an unexpired, unrevoked and unsuspended electrical contractor license.	First offense:	\$ 500
	Second offense:	\$ 1,000
	Third offense:	\$ 3,000
	Each offense thereafter:	\$ 5,000
(2) Employing an individual for the purposes of RCW 19.28.510 through 19.28.620 who does not possess a valid certificate of competency or training certificate.	First offense:	\$ 50
	Second offense:	\$ 100
	Each offense thereafter:	\$ 250
(3) Working as an electrician or electrical trainee in the electrical construction trade without having a valid certificate of competency or electrical training certificate.	First offense:	\$ 50
	Second offense:	\$ 100
	Each offense thereafter:	\$ 250
(4) Employing electricians and trainees in an improper ratio.	First offense:	\$ 50
	Second offense:	\$ 100
	Each additional offense:	\$ 250
(5) Failing to provide supervision to an electrical trainee as required by RCW 19.28.510.	First offense:	\$ 50
	Second offense:	\$ 100
	Each additional offense:	\$ 250
(6) Working as an electrical trainee without proper supervision as required by RCW 19.28.510.	First offense:	\$ 50
	Second offense:	\$ 100
	Each additional offense:	\$ 250
(7) Performing electrical installations, alterations or maintenance outside the scope of the firm's specialty electrical contractors license.	First offense:	\$ 250
	Second offense:	\$ 500
	Each additional offense:	\$ 1,000

(8) Selling or exchanging electrical equipment associated with spas, hot tubs, swimming pools or hydromassage bathtubs which is not listed and labeled by an approved electrical testing laboratory.	First offense:	\$ 500
	Second offense:	\$ 1,000
	Each additional offense:	\$ 2,000

Definition: The sale or exchange of electrical components associated with hot tubs, spas, swimming pools or hydromassage bathtubs means: "Sell, offer for sale, advertise, display for sale, dispose of by way of gift, loan, rental, lease, premium, barter or exchange."

(9) Violating any of the provisions of chapter 19.28 RCW or chapters 296-46 or 296-401 WAC which are not identified in subsections (1) through (8) of this section.	First offense:	\$ 50
	Second offense:	\$ 100
	Each additional offense:	\$ 250

(10) Each day that a violation occurs will be a separate offense. A violation will be a "second" or "additional" offense only if it occurs within one year from the first violation.

(11) In case of continued, repeated or gross violation of the provisions of chapter 19.28 RCW, chapter 296-46 or 296-401 WAC or if property damage or bodily injury occurs as a result of the failure of a person, firm, partnership, corporation, or other entity to comply with chapter 19.28 RCW, the department may double the penalty amounts shown in subsections (1) through (9) of this section.

[Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 87-10-030 (Order 87-07), § 296-46-920, filed 5/1/87; 86-18-041 (Order 86-23), § 296-46-920, filed 8/29/86.]

Chapter 296-52 WAC

SAFETY STANDARDS FOR THE POSSESSION AND HANDLING OF EXPLOSIVES

WAC

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PART A—GENERAL

WAC 296-52-401 Scope and application. (1) This chapter is adopted pursuant to the State Explosives Act, RCW 70.74.020, in accordance with chapter 34.04 RCW, the Administrative Procedure Act, and chapter 49.17 RCW, the Washington Industrial Safety and Health Act.

(2) This chapter shall be identified as chapter 296-52 WAC, "safety standards for possession, handling and

use of explosives" and hereafter be called the "explosive code."

(3) This chapter shall apply to:

(a) All aspects of manufacture, possession, storage, selling, purchase, transportation, and the use of explosives or blasting agents as defined in this chapter.

(b) Any person, partnership, company, corporation, or other entity, including governmental agencies, except:

(i) Storage, handling, and use of (noncommercial) military explosives while under the control of the United States Government and/or United States Military authorities.

(ii) Those instances and actions identified by RCW 70.74.191, "Exemptions."

(4) The enforcing authority of this chapter, the department of labor and industries, recognizes the obligation of other law enforcement agencies to enforce specific aspects or sections of chapter 70.74 RCW, the State Explosives Act, under local ordinance and with joint and shared authority as granted by RCW 70.74-.201. The division of industrial safety and health shall cooperate with all other law enforcement agencies in carrying out the intent of the explosive code and the State Explosives Act.

(5) In all activities governed by the State Explosives Act, chapter 70.74 RCW, the director shall administer this chapter with the full resources of the division of industrial safety and health, (WISHA). Where materials classified by this chapter as explosives or blasting agents may be found or where the director has reasonable cause to expect they exist, administration of this chapter shall include the right of entry for inspection purposes into any location, facility, or equipment at any such times as the director or his designated representative deems appropriate and to issue penalty sanctions for all instances found not to be in compliance with the requirements of this chapter.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-52-401, filed 11/14/88. Statutory Authority: RCW 49.17-.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-401, filed 5/6/86.]

PART B—EXPLOSIVES LICENSING

WAC 296-52-419 Basic legal obligations. (1) It is unlawful for any person to manufacture, purchase, sell, use, or store any explosive without having a validly issued license from the department of labor and industries which license has not been revoked or suspended. Violation of this section is a gross misdemeanor.

(2) Upon notice from the department of labor and industries or any law enforcement agency having jurisdiction, a person manufacturing, purchasing, selling, using, or storing any explosives without a license shall immediately surrender any and all such explosives to the department or to the respective law enforcement agency.

(3) At any time that the director of labor and industries requests the surrender of explosives from any person pursuant to subsection (2) of this section, the director may in addition request the attorney general to make application to the superior court of the county in

which the unlawful practice exists for a temporary restraining order or such other relief as appears to be appropriate under the circumstances.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-52-419, filed 11/14/88.]

WAC 296-52-421 Licenses--Information verification. (1) Any information request by the department, in order to verify statements in an application or in order to facilitate a department inquiry, shall be supplied prior to the issuance or renewal of a license.

(2) The director of labor and industries shall require, as a condition precedent to the original issuance or renewal of any explosive license, fingerprinting and criminal history record information checks of every applicant.

(a) In the case of a corporation, fingerprinting and criminal history record information checks shall be required for the management officials directly responsible for the operations where the explosives are used if such persons have not previously had their fingerprints recorded with the department of labor and industries.

(b) In the case of a partnership, fingerprinting and criminal history record information checks shall be required of all general partners.

(c) Such fingerprints as are required by the department of labor and industries shall be submitted on forms provided by the department to the identification section of the Washington state patrol and to the identification division of the Federal Bureau of Investigation in order that these agencies may search their records for prior convictions of the individuals fingerprinted.

(d) The Washington state patrol shall provide to the director of labor and industries such criminal record information as the director may request.

(e) The applicant shall give full cooperation to the department of labor and industries and shall assist the department of labor and industries in all aspects of fingerprinting and criminal history record information check.

(f) The applicant may be required to pay a fee not to exceed twenty dollars to the agency that performs the fingerprinting and criminal history process.

(3) The director of labor and industries shall not issue a license to manufacture, purchase, store, use, or deal with explosives to:

(a) Any persons under twenty-one years of age;

(b) Any person whose license is suspended or whose license has been revoked, except as provided in WAC 296-52-423;

(c) Any person who has been convicted in this state or elsewhere of a violent offense as defined in RCW 9.94A.030, perjury, false swearing, or bomb threats or a crime involving a schedule I or II controlled substance, or any other drug or alcohol related offenses, unless such other drug or alcohol related offense does not reflect a drug or alcohol dependency.

Exception: The director of labor and industries may issue a license if the person suffering a drug or alcohol related dependency is participating in or has completed an alcohol or drug recovery program acceptable to the department of labor and industries and has established control of their alcohol or drug dependency. The director of labor and industries

shall require the applicant to provide proof of such participation and control.

(d) Any person who has previously been adjudged to be mentally ill or insane, or to be incompetent due to any mental disability or disease and who has not at the time of application been restored to competency.

Note: See also WAC 296-52-425 and 296-52-433.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-52-421, filed 11/14/88. Statutory Authority: RCW 49.17-.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-421, filed 5/6/86.]

WAC 296-52-423 Revoking or suspending licenses.

(1) The department of labor and industries shall revoke and not renew the license of any person holding a manufacturer, dealer, purchaser, user, or storage license upon conviction of any of the following offenses, which conviction has become final:

(a) A violent offense as defined in RCW 9.94A.030;

(b) A crime involving perjury or false swearing, including the making of a false affidavit or statement under oath to the department of labor and industries in an application or report made pursuant to this title;

(c) A crime involving bomb threats;

(d) A crime involving a schedule I or II controlled substance, or any other drug or alcohol related offense, unless such other drug or alcohol related offense does not reflect a drug or alcohol dependency.

Conditional exception: The department of labor and industries may issue a conditional renewal of the license to any convicted person suffering a drug or alcohol dependency who is participating in an alcoholism or drug recovery program acceptable to the department of labor and industries and has established control of their alcohol or drug dependency. The department of labor and industries shall require the applicant to provide proof of such participation and control.

(e) A crime relating to possession, use, transfer, or sale of explosives under this chapter or any other chapter of the Revised Code of Washington.

(2) The department of labor and industries shall revoke the license of any person adjudged to be mentally ill or insane, or to be incompetent due to any mental disability or disease. The director shall not renew the license until the person has been restored to competency.

(3) The department of labor and industries is authorized to suspend, for a period of time not to exceed six months, the license of any person who has violated this chapter or the rules promulgated pursuant to this chapter.

(4) The department of labor and industries may revoke the license of any person who has repeatedly violated this chapter or the rules promulgated pursuant to this chapter, or who has twice had his or her license suspended under this chapter.

(5) Upon receipt of notification by the department of labor and industries of revocation or suspension, a licensee must surrender immediately to the department any or all such licenses revoked or suspended.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-52-423, filed 11/14/88.]

WAC 296-52-425 Dealer's license. (RCW 70.74.130 and 70.74.230, apply.)

(1) The application for a dealer's license to buy explosives for the sole purpose of resale shall be made to Department of Labor and Industries, Division of Industrial Safety and Health, Olympia.

(2) Original license applications and/or application for renewal shall be completed on forms available from the department and shall comply with all requirements of WAC 296-52-421. The license fee shall be twenty-five dollars.

(3) The license shall be renewed annually, no later than the expiration date.

(4) When an order for explosives is placed in person, by telephone, or in writing by a purchaser, the seller shall request proper authorization and identification from the purchaser and shall record the purchaser's license number.

(5) A dealer shall not distribute explosive materials to a company or individual on the order of a person who does not appear on the up to date list of representatives or agents and if the person does appear on the list, the dealer shall verify the identity of such person.

(6)(a) A dealer's record of all explosives purchased and sold as defined in RCW 70.74.010, shall be kept on file and a copy transmitted not later than the tenth of every month to the department.

(b) The purchaser's name and license number shall be stated on dealer's record, and the name of the person authorized by the purchaser to physically receive the explosives.

(c) The dealer shall ascertain the identity of the individual who receives the explosives from a picture-type identification card, such as a driver's license. The recipient shall sign a receipt, documenting the explosives received and said receipt shall be retained by the dealer for not less than one year from the date of purchase.

(7) Any package, cask, or can containing any explosive, nitroglycerin, dynamite, or powder that is put up for sale, or is delivered to any warehouseman, dock, depot, or common carrier shall be properly labeled thereon to indicate its explosive classification.

(8) If the explosives are delivered by the dealer or dealer's authorized agent to an explosives magazine, the license number of said magazine and the legal signature of the recipient, properly authorized and identified, shall be obtained.

(9) No person shall sell, display, or expose for sale any explosive or blasting agent on any highway, street, sidewalk, public way, or public place.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-52-425, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-425, filed 5/6/86.]

WAC 296-52-429 License for manufacturing. RCW 70.74.110, applies.

(1) No person, partnership, firm, company or corporation shall manufacture explosives or blasting agents or

use any process involving explosives as a component part in the manufacture of any device, article or product without first obtaining a manufacturer's license from the department of labor and industries.

(2) The application for license for manufacturing explosives and/or blasting agents shall be made to Department of Labor and Industries, Division of Industrial Safety and Health, Olympia. The license fee for either an original license or a renewal shall be twenty-five dollars.

(3) The application for original license or renewal shall be completed on forms available from the department and shall provide the following information:

(a) Location of place of manufacture or processing;

(b) Kind of explosives manufactured, processed, or used;

(c) The distance that such explosives manufacturing building is located or intended to be located from the other factory buildings, magazines, inhabited buildings, railroads, highways, and public utility transmission systems;

(d) The name and address of the applicant;

(e) The reason for desiring to manufacture explosives;

(f) The applicant's citizenship, if the applicant is an individual;

(g) If the applicant is a partnership, the names and addresses of the partners and their citizenship;

(h) If the applicant is an association or corporation, the names and addresses of the officers and directors thereof, and their citizenship; and

(i) Such other pertinent information as the director of labor and industries shall require to effectuate the purpose of this chapter.

(4) Each application for license shall be accompanied by a site plan of the proposed or existing manufacturing facilities. The plan shall show:

(a) The distance each manufacturing building is located from other buildings on the premises where people are employed, from other occupied buildings on adjoining property, from buildings where customers are served, from public highways and utility transmission systems.

(b) The site plan shall demonstrate compliance with all applicable requirements of chapter 70.74 RCW, the State Explosives Act as it exists at the time of this adoption or is hereafter amended; with applicable requirements of chapter 296-50 WAC, Safety standards—manufacture of explosives; with the separation/location requirements of this chapter.

(c) The site plan shall identify and describe all natural or artificial barricades which are utilized to influence minimum permissible separation distances.

(d) The site plan shall identify the nature of and kind of work carried on in each building.

(e) The site plan shall specify the maximum amount and kind of explosives or blasting agents which will be permitted in each building or magazine at any one time.

(5) The application for license shall comply with all requirements of WAC 296-52-421.

(6) Upon receipt of a completed application meeting all requirements of this section, the department will

schedule an inspection of the premises at the earliest time possible.

(7) The department will issue a license to the applicant(s) provided that:

(a) The required inspection confirms that the site plan is accurate and the facilities comply with applicable regulations of the department;

(b) The applicant(s) or operating superintendent and employees are sufficiently trained and experienced in the manufacture of explosives.

(8) A license to manufacture explosives and/or blasting agents shall be valid for not more than one year from the date of issue unless suspended or revoked by the department.

(9) A copy of the site plan and manufacturer's license shall be posted in the main office of each manufacturing plant.

(a) The site plan shall be maintained to reflect current status of manufacturing facilities, occupancy changes, etc.

(b) The department shall be notified when significant change occurs in the site plan. If the change is of such nature or magnitude as to make compliance with all requirements of this chapter questionable, the license holder shall consult with the department before changing the operations.

(10) Specific applicable requirements for the manufacture of explosives and blasting agents are codified and distributed in chapter 296-50 WAC, Safety standards—Manufacture of explosives.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-52-429, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-429, filed 5/6/86.]

WAC 296-52-433 Purchaser's license. RCW 70.74.135, applies.

(1) No person, firm, partnership, or corporation and including public agencies, shall be permitted to purchase explosives or blasting agents without a valid license as issued by the department of labor and industries.

(2) Applicants desiring to purchase explosives or blasting agents, except hand loader components as defined in this chapter, shall make application for license to the department of labor and industries. Application forms may be obtained at all department district offices, and from explosives dealers.

(3) Applicants shall comply with all requirements of WAC 296-52-421 and shall have a current user (blaster) license issued by the department. The purchaser's license fee shall be five dollars.

(4) Applicants shall be required to furnish at least the following information:

(a) The location where explosives are to be used;

(b) The kind and amount of explosives to be used;

(c) The name and address of the applicant;

(d) The reason for desiring to use explosives;

(e) The citizenship of the applicant, if the applicant is an individual;

(f) If the applicant is a partnership, the names and addresses of the partners and their citizenship;

(g) If the applicant is an association or corporation, the names and addresses of the officers and directors thereof and their citizenship;

(h) Documented proof of ownership of a licensed storage magazine or a signed authorization to use another person's licensed magazine; or the purchaser shall sign a statement certifying that the explosives will not be stored.

(i) Such other pertinent information as the director of the department of labor and industries shall require to effectuate the purposes of this chapter.

(5) The department will grant a purchaser's license after all legal requirements have been fulfilled.

(6) The license is valid for one year from date of issuance.

(7) Purchaser shall, prior to ordering explosive materials, furnish the dealer a current list of the representatives or agents authorized to order explosive materials on their behalf showing the name, address, drivers license number or valid identification and date and place of birth. A copy of the list shall be submitted with the purchaser's application. The dealer and the department lists shall be updated as changes occur.

(8) The individual who physically receives the purchased explosives shall prove to the satisfaction of the dealer that he, personally, is the purchaser, or the person authorized by the purchaser to receive said purchased explosives. Such authorization procedure shall be approved by the department. Said receiver of explosives shall identify himself properly and shall sign the dealer's record with his legal signature.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-52-433, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-433, filed 5/6/86.]

WAC 296-52-437 User's (blaster's) license. RCW 70.74.020, applies.

(1) No person, firm, partnership, or corporation shall use, blast, or dispose of explosives and/or blasting agents unless in possession of a valid user's (blaster's) license issued by the department of labor and industries.

(2) The application for a user's (blaster's) license to use, blast or dispose explosives and blasting agents shall be made to Department of Labor and Industries, Division of Industrial Safety and Health, Olympia.

(a) Application forms may be obtained at all department district offices, and from explosives dealers.

(b) The license is valid for one year from date of issuance. The license fee shall be five dollars.

(c) Applicants shall comply with all requirements of WAC 296-52-421.

(d) User (blaster) may be required to verify name of licensed purchaser, which will be confirmed and approved by the department.

(3) In addition to the submission of the application form, all new applicants, all applicants requesting change in classification of their license, and all applicants who have not renewed their user (blaster) license within sixty days of expiration will be required to submit

a resume of successful blasting experience, properly witnessed, and to pass a written examination prepared and administered by the department.

(4) User (blaster) qualifications:

(a) A user (blaster) shall be able to understand and give written and oral orders.

(b) A user (blaster) shall be in good physical condition and not be addicted to narcotics, intoxicants, or similar types of drugs. This rule does not apply to persons taking prescription drugs and/or narcotics as directed by a physician providing such use shall not endanger the worker or others.

(c) A user (blaster) shall be qualified by reason of training, knowledge, and experience, in the field of transporting, storing, handling, and use of explosives, and have a working knowledge of state and local laws and regulations which pertain to explosives.

(d) User (blaster) shall be required to furnish satisfactory evidence of competency in handling explosives and performing in a safe manner the type of blasting that will be required.

(e) The user (blaster) shall be knowledgeable and competent in the use of each type of blasting method used.

(5) The department will issue a user's license card which shall state the limitations imposed on the licensee and shall be presented by the user to authorized persons, upon request, together with valid personal identification.

(6) A "hand loader" as defined in RCW 70.74.010, does not require a user's license.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-52-437, filed 11/14/88. Statutory Authority: RCW 49.17-.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-437, filed 5/6/86.]

WAC 296-52-441 Storage magazine license requirements. RCW 70.74.120, applies.

(1) All explosives or blasting agents as defined in this chapter shall be kept or stored in magazines licensed by the department and which comply with the construction, location, and security requirements established by this chapter.

(2) Any person engaged in keeping or storing explosives or blasting agents shall make application to the department for an operating license for each storage magazine before engaging in the activity of keeping or storing explosives or blasting agents. Applications shall be made to the Department of Labor and Industries, Division of Industrial Safety and Health, Olympia, WA 98504.

(3) License applicants shall meet the requirements of WAC 296-52-421.

(4) License applicants or the officers, agents, or employees of the applicant shall demonstrate sufficient experience in the handling of explosives, including the storage requirements for the different types of explosives or blasting agents to be stored.

(5) Each application shall include the following information:

(a) The name and address of the applicant;

(b) The reason for desiring to store or possess explosives;

(c) The citizenship of the applicant if the applicant is an individual;

(d) If the applicant is a partnership, the names and addresses of the partners and their citizenship;

(e) If the applicant is an association or corporation, the names and addresses of the officers and directors thereof and their citizenship;

(f) The location of the magazine, if then existing, or in case of a new magazine, the proposed location of such magazine;

(g) The kind of explosives that are kept or stored or possessed or intended to be kept or stored or possessed and the maximum quantity that is intended to be kept or stored or possessed thereat;

(h) The distance that such magazine is located or intended to be located from other magazines, inhabited buildings, explosives manufacturing buildings, railroads, highways, and public utility transmission systems;

(i) And such other pertinent information as the director of the department of labor and industries shall require to effectuate the purpose of this chapter.

(6) A license number shall be permanently affixed on the inside and outside of each storage magazine. This license number will stay with each magazine during its life.

(7) The unlawful entry into an explosives magazine or an actual or suspected theft of explosives shall be reported immediately to the department and to the local law enforcement agency.

(8) If the magazine is used or leased by a person other than the owner, such other person shall then be responsible for the safe operation of the magazine, and for obtaining of the license.

When the responsibility for a magazine is transferred from one person to another, the transferor shall immediately notify the department, stating the magazine license number. The transferee shall execute a new application and pay the fee for one year, based on WAC 296-52-449.

(9) When a magazine is moved, altered or destroyed, the responsible person shall notify the department stating the magazine license number. When a magazine is altered, the alterations made shall be stated.

The moving of a magazine on a job site within a reasonable distance from its original location stated on the application is permitted without notifying the department; provided, that the new location complies with the Explosives Act and Explosives Code, and that the magazine can be quickly located for an inspection.

(10) Licenses will be issued pursuant to the procedures identified in WAC 296-52-445. The license fees are published in WAC 296-52-449.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-52-441, filed 11/14/88. Statutory Authority: RCW 49.17-.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-441, filed 5/6/86.]

WAC 296-52-445 Licenses and inspections. RCW 70.74.150, applies.

(1) Upon receipt of a completed application for license, the department will schedule the necessary inspection or examination at the earliest available and mutually agreeable date.

(2) Explosives manufacturing plants and all Class 2, 3, 4, or 5 magazines shall be inspected before being placed in operation or service and at annual intervals thereafter. New licenses or renewal licenses shall be issued for a period not to exceed one year. Class 1 magazines may be inspected and licensed for a period not to exceed two years.

(3) Each explosives license shall identify the operating limits for that license.

(4) Each license shall be valid until the specified expiration date or until suspended or revoked by the department.

(5) Any change in the conditions around a manufacturing plant or magazine shall be promptly identified to the department if such change could influence compliance with all requirements of this chapter. Such change(s) could include but are not limited to examples such as: Construction of occupied buildings, public utilities transmission systems, roads or railroads nearer said manufacturing plant or magazine.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-52-445, filed 11/14/88. Statutory Authority: RCW 49.17-.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-445, filed 5/6/86.]

WAC 296-52-449 Storage magazine license fees. RCW 70.74.140, applies.

The annual license fee for operating each magazine has been established by the department and shall be as shown in the following table:

Maximum weight (pounds) of explosives permitted in each magazine	Maximum number of blasting caps permitted in each magazine	Annual fee (dollars) for each magazine
200	133,000	10.00
1,000	667,000	25.00
5,000	3,335,000	35.00
10,000	6,670,000	45.00
50,000	33,350,000	60.00
Max. 300,000	Max. 200,000,000	75.00

Any permanent magazine licensed for two years shall pay twice the license fee shown.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-52-449, filed 11/14/88. Statutory Authority: RCW 49.17-.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-449, filed 5/6/86.]

PART D--EXPLOSIVES STORAGE

WAC 296-52-487 Low explosives. Magazines which are restricted to the storage of only Class C (low explosives) as defined in this chapter, or classified as low explosives by the United States Department of the Treasury, Bureau of Alcohol, Tobacco and Firearms, may be located in accordance with Table H-24.

TABLE H-24

Table of distances for storage of low explosives

Pounds		From inhabited building distance (feet)	From public railroad and highway distance (feet)	From above ground magazine (feet)
Over	Not Over			
0	1,000	75	75	50
1,000	5,000	115	115	75
5,000	10,000	150	150	100
10,000	20,000	190	190	125
20,000	30,000	215	215	145
30,000	40,000	235	235	155
40,000	50,000	250	250	165
50,000	60,000	260	260	175
60,000	70,000	270	270	185
70,000	80,000	280	280	190
80,000	90,000	295	295	195
90,000	100,000	300	300	200
100,000	200,000	375	375	250
200,000	300,000	450	450	300

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-52-487, filed 11/14/88.]

PART E--EXPLOSIVES TRANSPORTATION

WAC 296-52-489 Transportation. (1) The transportation of explosives by vehicle on public highways shall be administered by the United States Department of Transportation, CFR 49-1978, Parts 100 through 199, and the Washington state patrol under RCW 46-48.170. The following sections cover the transportation of explosives on the job site.

(a) No employee shall be allowed to smoke, carry matches or any other flame-producing device, or carry any firearms or loaded cartridges while in or near a motor vehicle transporting explosives; or drive, load, or unload such vehicle in a careless or reckless manner.

(b) Explosives shall not be carried on any vehicle while vehicle is being used to transport workers other than driver and two persons.

(c) Explosives shall be transferred from the disabled vehicle to another, only when proper and qualified supervision is provided.

(2) Transportation vehicles. Vehicles used for transporting explosives shall be strong enough to carry the load without difficulty and be in good mechanical condition. If vehicles do not have a closed body, the body shall be covered with a flameproof and moisture-proof tarpaulin or other effective protection against moisture and sparks. All vehicles used for the transportation of explosives shall have tight floors and any exposed spark-

producing metal on the inside of the body shall be covered with wood or other nonsparking materials to prevent contact with packages of explosives. Packages of explosives shall not be loaded above the sides of an open-body vehicle.

(3) Vehicles shall be placarded and displayed as specified by the United States Department of Transportation, CFR 49-1981, Parts 100 through 199.

(4)(a) Each motor vehicle used for transporting explosives shall be equipped with a minimum of two extinguishers, each having a rating of at least 10-BC.

(i) Only extinguishers listed or approved by a nationally recognized testing laboratory shall be deemed suitable for use on explosives-carrying vehicles. Refer to WAC 296-24-58501(19) for definition of listed, and federal regulation 29 CFR 1910.7 for nationally recognized testing laboratory.

(ii) Extinguishers shall be filled and ready for immediate use and readily available. Extinguishers shall be examined periodically by a competent person.

(b) A motor vehicle used for transporting explosives shall be given the following inspection to determine that it is in proper condition for safe transportation of explosives:

(i) Fire extinguishers shall be filled and in working order.

(ii) All electrical wiring shall be completely protected and securely fastened to prevent short-circuiting.

(iii) Chassis, motor, pan, and underside of body shall be reasonably clean and free of excess oil and grease.

(iv) Fuel tank and feedline shall be secure and have no leaks.

(v) Brakes, lights, horn, windshield wipers, and steering apparatus shall function properly.

(vi) Tires shall be checked for proper inflation and defects.

(vii) The vehicle shall be in proper condition in every other respect and acceptable for handling explosives.

(5) Operation of transportation vehicles.

(a) Vehicles transporting explosives shall only be driven by and be in the charge of a licensed driver who is not less than twenty-one years of age, physically fit, careful, capable, reliable, able to read and write the English language, and not addicted to the use, or under the influence of intoxicants, narcotics, or other dangerous drugs. This rule does not apply to persons taking prescription drugs and/or narcotics as directed by a physician providing such use shall not endanger the worker or others. They shall be familiar with the traffic regulations, state laws, and the provisions of this section.

(b) Except under emergency conditions, no vehicle transporting explosives shall be parked before reaching its destination, even though attended.

(c) Every motor vehicle transporting any quantity of Class A or Class B explosives shall, at all times, be attended by a driver or other attendant of the motor carrier. This attendant shall have been made aware of the class of the explosive material in the vehicle and of its inherent dangers, and shall have been instructed in the measures and procedures to be followed in order to protect the public from those dangers. He shall have been

made familiar with the vehicle he is assigned, and shall be trained, supplied with the necessary means, and authorized to move the vehicle when required.

(i) For the purpose of this subdivision, a motor vehicle shall be deemed "attended" only when the driver or other attendant is physically on or in the vehicle, or has the vehicle within his field of vision and can reach it quickly and without any kind of interference; "attended" also means that the driver or attendant is awake, alert, and not engaged in other duties or activities which may divert his attention from the vehicle.

(ii) However, an explosive-laden vehicle may be left unattended if parked within a securely fenced or walled area properly barricaded with all gates or entrances locked where parking of such vehicle is otherwise permissible, or at a magazine site established solely for the purpose of storing explosives.

(d) No spark-producing metal, spark-producing tools, oils, matches, firearms, electric storage batteries, flammable substances, acids, oxidizing materials, or corrosive compounds shall be carried in the body of any motor truck and/or vehicle transporting explosives, unless the loading of such dangerous articles and the explosives comply with U.S. Department of Transportation regulations.

(e) Vehicles transporting explosives shall avoid congested areas and heavy traffic.

(f) Delivery shall only be made to authorized persons and into authorized magazines of authorized temporary storage or handling area.

(6) Transporting of explosives and blasting caps or electric blasting caps in the same vehicle. Blasting caps, blasting caps with safety fuse, blasting caps with metal clad mild detonating fuse and/or electric blasting caps may be transported in the same vehicle with other explosives, provided the following condition is complied with:

The top, lid or door, sides and bottom of each container must be of laminate construction consisting of A/C grade or better exterior plywood, solid hardwood, asbestos board or sheetrock and sheet metal. In order of arrangement, from inside to outside, the laminate must consist of the following with the minimum thickness of each lamination as indicated: 1/4-inch plywood, 1-inch solid hardwood, 1/2-inch plywood, 1/2-inch sheetrock or 1/4-inch asbestos board, and 22-gauge sheet metal constructed inside to outside in that order.

(7) When primers are made up at a central primer house for use in high speed tunneling, the following shall apply:

(a) Only enough primers shall be made up for one day's usage.

(b) The primers shall be placed in separate containers or bins, categorized by degree of delay in such a manner so as to prevent them from physical impact.

(c) Explosives carried in the same magazine shall be separated by 1/4-inch steel, covered on each side by four inches of hardwood planking, or equivalent.

(d) Only a state approved powder car or vehicle shall be used underground.

(e) The number of primers for one round will be removed from the state approved car or vehicle at the face or heading after the drilling has been completed and the holes readied for loading. After loading the charge, the powder car or vehicle will be withdrawn from the tunnel.

(f) Wires on electric caps shall be kept shunted until wired to the bus wires.

(g) The powder car or vehicle shall be inspected daily for lights, brakes and external damage to electrical circuitry. The electrical system shall be checked weekly to detect any failures that may constitute an electrical hazard and a written record of such inspection shall be kept on file for the duration of the job.

(8) When explosives are carried to the blasting site from the main storage magazines by the blaster or helper:

(a) Special insulated containers shall be used for this purpose, either boxes or bags, one container for explosives and one for detonators.

(b) Detonators or explosives shall never be carried in pockets of clothing.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-52-489, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-10-044 (Order 86-24), § 296-52-489, filed 5/6/86.]

Chapter 296-54 WAC

SAFETY STANDARDS—LOGGING OPERATIONS

WAC

- 296-54-45001 Pulpwood logging.
- 296-54-501 Scope and application.
- 296-54-505 Definitions applicable to this chapter.
- 296-54-559 Yarding—Helicopters and helicopter cranes.
- 296-54-605 Radio systems used for voice communication, activation of audible signals, or equipment.
- 296-54-990 Repealed.
- 296-54-99001 Repealed.
- 296-54-99005 Repealed.
- 296-54-99006 Repealed.
- 296-54-99011 Repealed.
- 296-54-99012 Repealed.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

- 296-54-990 Map. [Order 72-14, Map (codified as WAC 296-54-990), filed 7/31/72, effective 9/1/72.] Repealed by 88-23-054 (Order 88-25), filed 11/14/88. Statutory Authority: Chapter 49.17 RCW.
- 296-54-99001 Appendix I—Figure 1—Rigging up, wrapping a guy-line. [Order 72-14, Figure 1 (codified as WAC 296-54-99001), filed 7/31/72, effective 9/1/72.] Repealed by 88-23-054 (Order 88-25), filed 11/14/88. Statutory Authority: Chapter 49.17 RCW.
- 296-54-99005 Appendix I—Figure 5—Standard signals for tractor logging. [Order 72-14, Figure 5 (codified as WAC 296-54-99005), filed 7/31/72, effective 9/1/72.] Repealed by 88-23-054 (Order 88-25), filed 11/14/88. Statutory Authority: Chapter 49.17 RCW.
- 296-54-99006 Appendix I—Figure 6—Standard signals for loading logs. [Order 72-14, Figure 6 (codified as WAC 296-54-99006), filed 7/31/72, effective 9/1/72.] Repealed by 88-23-054 (Order 88-25), filed 11/14/88. Statutory Authority: Chapter 49.17 RCW.
- 296-54-99011 Appendix I—Figure 11—Placement and number of binders. [Order 72-14, Figure 11 (codified as WAC

296-54-99011), filed 7/31/72, effective 9/1/72.] Repealed by 88-23-054 (Order 88-25), filed 11/14/88. Statutory Authority: Chapter 49.17 RCW.

296-54-99012 Appendix I—Figure 12—Standard signals for high lead logging. [Order 72-14, Figure 12 (codified as WAC 296-54-99012), filed 7/31/72, effective 9/1/72.] Repealed by 88-23-054 (Order 88-25), filed 11/14/88. Statutory Authority: Chapter 49.17 RCW.

WAC 296-54-45001 Pulpwood logging. (1) Application.

(a) General. This section applies to pulpwood logging operations including, but not limited to the operations of felling, limbing, marking, bucking, loading, skidding, prehauling and other operations associated with the preparation and movement of pulpwood timber from the stump to the point of delivery. The provisions of this section do not apply to logging operations relating to sawlogs, veneer bolts, poles, piling and other forest products.

(b) Standards incorporated by reference. Standards covering issues of occupational safety and health which are of general application without regard to any specific industry are incorporated by reference in subsections of this section and made applicable to pulpwood logging.

(2) Definitions applicable to this section.

(a) "Arch" means an extension to rear section of a vehicle used in skidding used to raise the forward part of a load clear of the ground.

(b) "Back cut" means the final cut in a felling operation made on the opposite side from the undercut.

(c) "Backfill" means excavated material used to build up a road higher than the original level.

(d) "Ballistic nylon" means a fabric of high tensile properties designed to provide protection from lacerations.

(e) "Borrow" means road construction material which is taken to another location for use. The source area is called "borrow pit."

(f) "Buck" means the process of severing a tree into sections (logs or bolts).

(g) "Choker" means a length of wire rope or chain with a loop or noose at one end used to secure trees or sections of trees for skidding.

(h) "Debark" means the action of removing bark from trees or sections of trees. Debark generally denotes mechanical means as opposed to manual peeling. Synonyms are "bark" and "barking."

(i) "Fairlead" means an arrangement of horizontal, and sometimes vertical, rollers usually mounted at the end of an arch to allow free play of wire rope during winching.

(j) "Fell" means the process of severing a tree from the stump so that it drops to the ground. Note that "fell" and "feller" are used in this standard. The terms "fall" and "faller" are commonly used in the Western United States and they have the same meaning as "fell" and "feller."

(k) "Grade" means the slope of a surface such as a roadway. Also, the elevation of a real or planned surface or structure. (See slope.)

(l) "Guarded" means protected by a cover, shield, rail, or other device, or by location, so as to reduce the probability of injury.

(m) "Guyline" means a line used to stay or support spar trees, booms, etc.

(n) "Landing" means any area where wood is concentrated. It is also called "yard," "deck," "brow."

(o) "Lodged tree" means a tree that has not fallen to the ground after being partly or wholly separated from its stump or otherwise displaced from its natural position.

(p) "Pickaroon" means a device with a head similar to an axe but with a point rather than a blade mounted on the end of a handle which is used to assist in the lifting and placement of bolts of wood.

(q) "Prehaul" means the hauling of forest products by off-the-road vehicles, nonhighway transport, or other movement prior to highway or rail movement, where the pulpwood travels clear of the ground. The term "forward" has the same meaning.

(r) "Pulpwood" means portions of a tree cut into short (normally 4 ft.) lengths to facilitate hand handling. It is intended to be used in the making of pulp rather than any lumber or veneer type finished product.

(s) "Riprap" means rock, metal stripping, or wooden timbers used to contain and stabilize earth embankments and fills.

(t) "Root wad" means the ball of roots which extends above ground level when a tree is pushed over by wind or other means.

(3) Additional definitions.

(a) "Skid" means the movement of bolts, logs, or trees by pulling or towing across the terrain. It may be accomplished by a stationary machine, a moving vehicle, or animal. The term is also called "yarding." The definitive feature is contact between the terrain and the product during movement.

(b) "Slope" is a term of measurement in percent and means the increase in height over the distance measured. An increase of 1 foot over a distance of 5 feet is expressed as a 20 percent slope (see grade).

(c) "Snag" means any dead standing tree or portion thereof remaining standing.

(d) "Spring pole" means a section of tree, sapling, limb, etc., which is, by virtue of its arrangement with relation to other material, under tension.

(e) "Undercut" means a notch cut in a tree to guide the tree in felling.

(f) "Widow maker" means an overhanging limb or section of tree which could become dislodged and drop to the ground (see also "lodged tree").

(g) "Wood hook" and "pulp hook" mean a device to be held in one hand which is fitted with a pointed section. The device is used to assist in the manual piling and handling of bolts of wood (see Pickaroon).

(4) General requirements.

(a) Clothing, personal protective devices, and first aid.

(i) Gloves shall be provided for use when working with wire rope in any form.

(ii) The employer shall ensure that employees exposed to the danger of foot injury due to falling or rolling

pulpwood shall wear foot protection which equals or exceeds the crushing and impact specifications of ANSI Z41.1-1967.

(iii) Safety helmets of approved design in accordance with American National Standard for Safety Requirements for Industrial Head Protection, Z89.1-1969 shall be provided and worn.

(iv) Eye or face protection in accordance with American National Standard for Practice for Occupational and Educational Eye and Face Protection, Z87.1-1968 shall be provided and used where chips and sawdust or flying particles are present.

(v) Dust masks in accordance with American National Standard Practices for Respiratory Protection, Z88.2-1969 shall be provided and used where exposure exceeds the limits specified in the general occupational health standards, chapter 296-62 WAC.

(vi) Protection against the effects of noise exposure shall be provided and used when the sound levels exceed those shown in WAC 296-62-09011, Table 7, of the general occupational health standards, when measured on the A scale of a standard sound level meter at slow response.

(vii) First-aid kits in compliance with the requirements of the general safety and health standards, WAC 296-24-065, shall be provided at the work site and on all transport vehicles. In all areas where poisonous snakes may exist, snake bite kits shall be a part of the regular first-aid equipment. First-aid kits shall be regularly inspected and replenished.

(b) Handtools.

(i) The employer shall be responsible for the condition of tools when furnished by him and the user shall inspect any tool prior to using it to determine that it is in proper operating condition. Defective tools shall be removed from service.

(ii) Handles shall be sound, straight and tight fitting.

(iii) Driven tools shall be dressed to remove any mushrooming.

(iv) Cutting tools shall be kept sharp and properly shaped.

(v) Wood hooks and pickaroons of good grade steel shall be used.

(vi) Tools shall be used for purposes for which they were designed.

(vii) Hand tools shall be sheathed or boxed if transported in a vehicle with personnel. If not contained in a box, the sheathed tools shall be fastened to the vehicle.

(viii) Proper storage facilities shall be provided for hand tools. Tools shall be stored in the provided location at all times when not in use.

(c) Environmental conditions.

(i) All work shall terminate and employees moved to a place of safety during electrical storms and periods of high winds or when other unusual weather conditions are dangerous to personnel.

(ii) Dead, broken, or rotted limbs or trees that are a hazard (widow makers) shall be felled or otherwise removed before commencing logging operations, building roads, trails or landing, in their vicinity.

(d) Work areas.

(i) All persons shall be instructed to work within the vocal range of other workers unless a procedure has been established for periodically checking their location and welfare.

(ii) All persons shall be accounted for at the end of each work day.

(iii) An approved fire extinguisher shall be provided at locations where machines are operating and/or on each vehicle. Refer to WAC 296-24-58501(19) for definition of approved.

(iv) Fuel shall be stored only in approved well-marked containers located for safe access for fueling vehicles and equipment and at a safe distance from all fire hazards. Refer to WAC 296-24-58501(19) for definition of approved. The provisions of the general safety and health standards, WAC 296-24-330 through 296-24-33019, shall be applied in the storage and use of flammable fuel.

(e) Chain saw operations.

(i) Chain saw operators shall be instructed to inspect saws daily to assure that all handles and guards are in place and tight, that all controls function properly and that the muffler is operative. Defective equipment shall not be used.

(ii) Chain saw operators shall be instructed to follow manufacturer's instructions as to operation and adjustment.

(iii) Chain saw operators shall be instructed to fuel the saw only in safe areas and not under conditions conducive to fire such as near persons smoking, hot engine, etc.

(iv) Chain saw operators shall be instructed to hold the saw with both hands during operation.

(v) Chain saw operators shall be instructed to start the saw at least 10 feet away from fueling area.

(vi) Chain saw operators shall be instructed to start the saw only on the ground or when otherwise firmly supported.

(vii) Chain saw operators shall be instructed to be certain of footing and to clear away brush which might interfere before starting to cut.

(viii) Chain saw operators shall be instructed not to use engine fuel for starting fires or as a cleaning solvent.

(ix) Chain saw operators shall be instructed to shut off the saw when carrying it for a distance greater than from tree to tree or in hazardous conditions such as slippery surfaces or heavy underbrush. If the operator is carrying a running saw, the saw shall be at idle speed.

(x) Chain saw operators shall be instructed to carry the saw in a manner to prevent contact with the chain and muffler.

(xi) Chain saw operators shall be instructed not to use the saw to cut directly overhead or at a distance that would require the operator to relinquish a safe grip on the saw.

(xii) Supervision shall be adequately maintained to assure that the instructions required by this chapter are followed.

(f) Stationary and mobile equipment operation.

(i) Equipment operators shall be instructed as to the manufacturers' recommendations for equipment operation, maintenance, safe practices, and site operating procedures.

(ii) Equipment shall be kept free of flammable material.

(iii) Equipment shall be kept free of any material which might contribute to slipping and falling.

(iv) Engine of equipment shall be shut down during fueling, servicing, and repairs except where operation is required for adjustment.

(v) The operator shall inspect the equipment he will be operating at the start of each shift for evidence of failure or incipient failure. Equipment found to have defects which might affect the operating safety shall not be used.

(vi) The equipment operator shall walk completely around machine and assure that no obstacles or personnel are in the area before startup.

(vii) The equipment operator shall start and operate equipment only from the operator's station or from safe area recommended by the manufacturer.

(viii) A seat belt shall be provided on mobile equipment.

(ix) The equipment operator shall check all controls for proper function and response before starting working cycle.

(x) The equipment operator shall ground or secure all movable elements when not in use.

(xi) The foreman shall advise the equipment operator of the load capacity, operating speed and stability limitations of the equipment.

(xii) The equipment operator shall maintain adequate distance from other equipment and personnel.

(xiii) Where signalmen are used, the equipment operator shall operate the equipment only on signal from the designated signalman and only when signal is distinct and clearly understood.

(xiv) The equipment operator shall not operate movable elements (boom, grapple, load, etc.) close to or over personnel.

(xv) The equipment operator shall signal his intention before operation when personnel are in or near the working area.

(xvi) The equipment operator shall dismount and stand clear for all loading and unloading of his mobile vehicle by other mobile equipment. The dismounted operator shall be visible to loader operator.

(xvii) The equipment operator shall operate equipment in a manner that will not place undue shock loads on wire rope.

(xviii) The equipment operator shall not permit riders or observers on the machine unless approved seating and protection is provided.

(xix) The equipment operator shall shut down the engine when the equipment is stopped, apply brake locks and ground moving elements before he dismounts.

(xx) The equipment operator shall when any equipment is transported from one job location to another, transport it on a vehicle of sufficient rated capacity and the equipment shall be properly secured during transit.

(xxi) When any equipment is being moved or operated in the vicinity of an electric distribution line a minimum clearance of ten feet shall be maintained between the electric distribution line and all elements of the machine.

(g) Explosives. Only trained and experienced personnel shall handle or use explosives. Usage shall comply with the requirements of chapter 296-52 WAC and chapter 70.74 RCW.

(5) Equipment protective devices—Stationary and mobile equipment.

(a) Operator's manual. There shall be an operator's manual or operating instructions with each machine. It will describe operation, maintenance, and safe practices.

(b) On all mobile equipment specified in WAC 296-54-216, rollover protective structures (ROPS) shall be installed and maintained in accordance with the provisions of that section. On equipment requiring ROPS, the provisions of WAC 296-54-210, 296-54-215, 296-54-217 and 296-54-218 shall also apply.

(c) Equipment on which ROPS are not required shall be equipped with the following operator protective devices:

(i) Protective canopy. A protective canopy shall be provided for the operator of mobile equipment. It shall be so constructed as to protect the operator from injury due to falling trees or limbs, saplings or branches which might enter the compartment side areas, and snapping winch lines or other objects.

(A) The canopy shall be of adequate size so as not to impair the operator's movements.

(B) The canopy framework shall consist of at least two arches, either transverse or longitudinal. If transverse, one arch shall be installed behind the operator and one immediately in front of the operator. They shall be joined at the top by at least two longitudinal braces. There shall be two braces which shall act as deflecting guards extending from the leading edge of the forward arch to the front part of the frame of the tractor. If longitudinal arches are used, they shall be extended from behind the operator to the front part of the frame and each arch shall have an intermediate support located immediately ahead of the operator so that ingress or egress is not impeded. Regardless of the type of construction used, the fabrication and method of connecting to the tractor shall be of such design as to develop a strength equivalent to the upright members.

(C) The overhead covering shall be solid material and extend the full width of the canopy.

(D) The lower portion of cab shall be completely enclosed with solid material, except at entrances, to prevent the operator from being injured from obstacles entering the cab.

(E) The upper rear portion of cab shall be fully enclosed with open mesh material with openings of such a size as to reject the entrance of an object larger than 1 3/4 inch in diameter. It shall provide maximum rearward visibility.

(F) Open mesh shall be extended forward as far as possible from the rear corners of the cab sides so as to give the maximum protection against obstacles, branches, etc., entering the cab area.

(G) Deflectors shall also be installed ahead of the operator to deflect whipping saplings and branches. These shall be located so as to not impede ingress or egress from the compartment.

(H) The entrance opening of the canopy shall be not less than 52 inches in vertical height.

(I) Where glass is used it shall be safety glass. An approved substitute may be used.

(aa) An additional metal screen shall be used where glass alone is not adequate operator protection.

(bb) Provision shall be made to clean glass to assure adequate visibility.

(ii) Guards. Guards shall be provided for exposed moving elements such as shafts, pulleys, belts, conveyors and gears in accordance with WAC 296-24-205 through 296-24-20527 and American National Standard Safety Code for Conveyors, Cableways, and Related Equipment, B20.1-1957. Guards shall be in place at all times machine is in operation.

(iii) Mufflers. Mufflers provided by the manufacturer or their equivalent shall be in place at all times the machine is in operation.

(iv) Guylines. Guylines shall be arranged in such manner that stresses will be imposed on not less than two guylines. Stumps used for anchoring guylines shall be carefully chosen as to position and strength. They shall be tied back if necessary. Standing trees shall not be used for this purpose.

(v) Stability and reliability. Crane and loader stability and boom reliability shall be in accordance with American National Standard Safety Code for Cranes, Derricks and Hoists Overhead and Gantry Cranes, B30.2.0-1967, and American National Standard Safety Code for Cranes, Derricks and Hoists—Crawler, Locomotive, and Truck Cranes, B30.5-1968.

(6) Pulpwood harvesting.

(a) Felling, general.

(i) Work areas shall be assigned such that a tree cannot fall into an adjacent work area. The recommended distance between workers is twice the height of trees being felled.

(ii) When trees may fall into public roads a flagman shall be assigned to direct traffic.

(iii) Workers shall not approach a feller closer than twice the height of trees being felled until the feller has acknowledged the signal of approach.

(iv) Lodged trees shall be pulled to the ground at first opportunity with mechanical equipment or animal.

(v) Workers shall not work under a lodged tree.

(vi) Special precautions shall be taken to prevent felling trees into powerlines.

(vii) If a tree does make contact with a powerline the power company shall be notified immediately and all personnel shall remain clear of the area until power company personnel advises that conditions are safe.

(b) Manual felling.

(i) The feller shall plan a retreat path and clear the path as necessary before cut is started.

(ii) The feller shall appraise situation for dead limbs, the lean of tree to be cut, wind conditions, location of

other trees and other hazards and exercise proper precautions before cut is started.

(iii) Undercuts shall be about one-third the diameter of the tree to guide tree and reduce possibility of splitting. (Local practice where small diameter trees are felled without being undercut is acceptable if the direction of fall is controlled by the practice.)

(iv) Back or felling cut shall be parallel to the inner edge of the undercut and approximately two inches higher than the undercut.

(v) The saw shall be shut off before feller starts his retreat.

(vi) On terrain where trees are likely to slide or roll fellers shall fell trees from the uphill side and arrange to keep uphill from previously felled trees.

(c) Bucking.

(i) Bucking on slopes shall be from the uphill side unless the log has been securely blocked to prevent rolling or swinging.

(ii) Spring poles and trees under stress shall be cut so that employee is clear when the tension is released. (This is accomplished by cutting under the bend.)

(iii) Trees piled for bucking shall be piled in an orderly parallel manner that minimizes hazard to employees.

(d) Limbing. Spring poles and limbs under stress shall be cut in such a manner that the employee is clear when tension is released.

(e) Mechanical debarking and delimiting. Guarding shall be provided so as to protect employees from flying chunks, logs, chips, bark, limbs, and other material and to prevent the worker from contacting moving parts.

(f) Skidding and prehauling, general.

(i) Only a designated, trained operator shall operate a skid or prehaul machine.

(ii) Choker setters shall work on uphill side of log.

(iii) No passenger personnel shall ride on a prehaul vehicle, logs, pallets, skid pans or other load unless adequate seating and protection is provided except on animal powered wagons.

(iv) Chokers shall be positioned near the end of the log or tree length to allow turning of the prehaul vehicle, to prevent the penetration of the operator station and to reduce possibility of striking the wheel or track.

(v) During winching, the equipment shall be positioned so that the winch line is in alignment with the long axis of the prehaul machine.

(vi) A stuck or inoperative vehicle shall be towed. A loaded pallet shall not be pushed.

(vii) Stakes shall not be added to permit a load beyond the rated capacity of pallets and trailers.

(viii) The operator shall be instructed to be observant and cautious of height of load and vehicle when traveling under trees, limbs, and other overhead obstructions.

(g) Skidding and prehauling equipment requirements.

(i) Arches, fairleads, drawbars, hitches and bumpers or fenders shall be designed and constructed to allow a minimum radius vehicle turn without the load contacting a rear tire or the rear of a track assembly.

(ii) Towed equipment such as skid pans, pallets and trailers shall be attached in such a manner as to allow a

full 90° turn, prevent overrunning of the towed vehicle, and assure control of the towed equipment.

(iii) Animal towed equipment shall be equipped with a hand brake within reach of the driver.

(iv) Prehaulers shall have a means for securely retaining pallets or pulpwood.

(v) Prehaulers shall have a means of securely retaining loader for transport when so equipped.

(vi) Provision shall be made to securely fasten and to protect all tools and material on the carrier.

(h) Personnel transport.

(i) The driver shall be licensed as required by the Washington state department of motor vehicles.

(ii) Explosives or flammable liquids shall not be transported on crew vehicles except as specifically provided for in WAC 296-54-160.

(iii) Seats shall be securely fastened.

(i) Off highway truck transport. Truck drivers shall be instructed to stop their vehicles, dismount, check and tighten loose load binders, either just before or immediately after leaving a private road to enter a public road.

(j) Manual loading.

(i) The carrier shall be positioned to provide a safe working clearance between carrier and pile.

(ii) Proper lifting techniques shall be used, i.e., straight back and bend knees.

(iii) The stick shall be placed in the carrier in such manner that it is or will be properly secured.

(iv) Manual handling shall be limited to a weight consistent with correct lifting practices and individual lifting capacity.

(k) Machine loading.

(i) Piles shall be located to provide a safe work area.

(ii) Only the machine operator and slingman where used, shall be in the work area.

(iii) The load shall be positioned for balance and to prevent slippage or loss. Slings shall be placed to secure and balance the load.

(l) Storage. Piles shall be located and constructed in a manner to provide safe working area around them.

(m) Banding and piling bundles.

(i) Steel bands used in the making of bundles shall have a 5 to 1 safety factor for the weight of the bundles and shall be free of any visible defect which might detract from their designed strength.

(ii) Bands shall be placed when bundle is close to ground.

(iii) No part of the body shall be under the bundle at any time. Bundles shall be placed on runners. Bundles may be double stacked with top end bundle one half or more back from the lower rank end bundle.

(n) Chipping (in-woods locations).

(i) Access covers or doors shall not be opened until the drum or disk is at a complete stop.

(ii) Infeed and discharge ports shall be designed to prevent contact by personnel with disc, knives, or blower blades.

(o) Roads and trails, general.

(i) Roads shall be maintained and hazardous conditions corrected.

(ii) Where vision is limited warnings shall be posted.

(iii) Curve radii shall be the maximum consistent with terrain.

(iv) When night work is necessary, lighting shall be provided in accordance with WAC 296-54-280.

(v) Local road standards and maximum weight of traffic expected shall be used as guides for materials, construction features and drainage.

(p) Road and trail pioneering and earthwork.

(i) Banks at the borrow area shall be sloped to prevent slides.

(ii) Backfill shall be firmly compacted.

(iii) Roadside banks shall be sloped or stabilized to prevent slides.

(iv) Overhanging banks, large rocks and debris shall be removed or secured.

(v) Where riprap is used the material and design shall assure containment of material.

(vi) Trees or snags which may fall into the road shall be felled.

(q) Road and trail drainage.

(i) Drainage shall be provided to prevent washouts and landslides.

(ii) Culverts shall be of adequate strength and of a size to handle maximum runoff.

(iii) Where necessary, ditches and banks shall be stabilized by vegetation, riprap, or other adequate means.

(r) Road and trail surfacing. Road surface shall be properly compacted, graded and crowned.

(s) Bridges.

(i) Bridges shall be constructed in accordance with the provisions of WAC 296-54-150.

(ii) Bridges shall be decked and curbed.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-54-45001, filed 11/14/88; Order 76-7, § 296-54-45001, filed 3/1/76; Order 74-20, § 296-54-450 (codified as WAC 296-54-45001), filed 5/6/74.]

WAC 296-54-501 Scope and application. The requirements of this chapter augment those requirements of the general safety standards promulgated by the department of labor and industries, division of industrial safety and health, applicable to this industry, and apply to all persons, firms, corporations or others engaged in logging operations that come within the jurisdiction of the department of labor and industries. The requirements herein contained do not apply to log handling at sawmills, plywood mills, pulp mills or other manufacturing operations governed by their own specific safety standards.

The safety requirements herein contained are not to be construed to imply that other safe work practices, procedures or methods should not be employed where such methods, means or practices may be required to prevent accidents. Both employers and employees have a duty to do whatever is reasonable and practical to avoid causing accidents. These requirements are minimum safety requirements and shall augment other safety standards developed by the department which are of a general nature and apply to all industrial operations such as those contained in the general safety standards, chapter 296-24 WAC; occupational health standards,

chapter 296-62 WAC; and precautionary labeling of containers of hazardous materials, chapter 296-64 WAC, or others which may be applicable. Regulations adopted by the department concerning certain types of equipment or conditions, such as metal and nonmetallic mines, quarries, pits and crushing operations, chapter 296-61 WAC, and possession, handling and use of explosives, chapter 296-52 WAC shall be complied with when applicable.

Some of the factors involving safe practices are use of good judgment, and the avoidance of taking chances. Accidents can be avoided in many instances by everyone conscientiously applying their knowledge of safety.

Copies of all society of automotive engineers reports (SAE) referred to in these standards are on file in all district offices of the division of industrial safety and health of the department of labor and industries, and may be reviewed by any interested person. Individuals desiring to obtain copies of such material shall arrange to do so directly from the publishers or from other sources. The division of industrial safety and health will not assume the responsibility of acquiring such material for uses other than its own needs.

Note: Safety standards for pulpwood logging are contained in a separate edition titled "Safety standards for pulpwood logging," WAC 296-54-45001.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-54-501, filed 11/14/88. Statutory Authority: RCW 49.17-.040, 49.17.150 and 49.17.240. 79-10-081 (Order 79-14), § 296-54-501, filed 9/21/79.]

WAC 296-54-505 Definitions applicable to this chapter. (1) A-frame - a structure made of two independent columns fastened together at the top and separated by a reasonable width at the bottom to stabilize the unit from tipping sideways.

(2) Alternate communication system - a system approved by the department of labor and industries, which by voice or other media than horn or whistle, provides a safe and reliable method of communication between crew members.

(3) A side - any place of activity involving a group in the yarding and loading of logs.

(4) An operation - any place where logging or log related activities are taking place.

(5) Approved - approved by the department of labor and industries, division of industrial safety and health.

(6) Arch - any device attached to the back of a vehicle and used for raising one end of logs to facilitate movement.

(7) Authorized person - a person approved or assigned by the employer to perform a specific type of duty(s) or to be at a specific location at a certain time(s).

(8) Back line - that section of the haulback that runs between the spar tree and the corner block.

(9) Ballistic nylon - a fabric of high tensile properties designed to provide protection from lacerations.

(10) Barrier - a fence, wall or railing to prevent passage or approach.

(11) Base of tree - that portion of a natural tree not more than three feet above ground level.

- (12) Bight of the line – any area where a person is exposed to a controlled or uncontrolled moving line.
- (13) Binder – a hinged lever assembly for connecting the ends of a wrapper to tighten the wrapper around the load of logs or materials.
- (14) Boomboat – any boat used to push or pull logs, booms, bundles, or bags, in booming ground operations.
- (15) Boomscooter – a small boat, usually less than fourteen feet in length, equipped with an outboard motor, having directional pushing capabilities of 360 degrees.
- (16) Brailing – when tiers of logs, poles, or piles are fastened together with a type of dogline and the ends of the side members are then fastened together for towing.
- (17) Brow log – a log or a suitable substitute placed parallel to any roadway at a landing or dump to protect the carrier and facilitate the safe loading or unloading of logs, timber products, or materials.
- (18) Bullbuck – the supervisor of the cutting crew.
- (19) Butt welding – the practice of welding something end to end.
- (20) Cable tree thinning – the selective thinning of a timber stand utilizing mobile yarding equipment specifically designed or adapted for the purpose. Such systems may be of the skyline, slackline, or modified slackline, overhead cable system.
- (21) Choker – a length of wire rope with attachments for encircling the end of a log to be yarded.
- (22) Chunking – the clearing of nonusable material from a specified area.
- (23) Cold deck – any pile of logs which is yarded and left for future removal.
- (24) Competent person – one who is capable of identifying hazards in the surrounding or working conditions which are unsanitary, hazardous or dangerous.
- (25) Corner block – the first block the haulback passes through on its way to the tail block.
- (26) Crew bus or vehicle – any vehicle furnished by or for the employer that will transport five or more persons.
- (27) Crotch line – two short lines attached to the same ring or shackle, used for loading or unloading.
- (28) Danger trees – any tree of any height, dead or alive, that presents a hazard to workers because of rot, root, stem or limb damage, lean, or any other observable condition created by natural process or man-made activity.
- (29) Directional falling – a mechanical means to control the direction of falling timber.
- (30) Dog line – type of line used to fasten logs or timber products together by the use of dogs.
- (31) Donkey – any machine with a series of drums used to yard logs.
- (32) Double ended logs – two logs end to end on the same lay.
- (33) Droplines – a short line attached to the carriage or carriage block which is used as an extension to the main line.
- (34) Drum – a mechanical device on which line is spooled or unspooled.
- (35) Dry land storage – decks of logs stored for future removal or use.
- (36) Dutchman –
- (a) A block used to change direction of line lead.
- (b) A method of falling timber consisting of inserting a piece of material into one side of the undercut to assist in pulling a tree against the lean or a section of the undercut can be left in a corner to accomplish the same purpose.
- (37) Experienced person – a person who has been trained and has participated in the subject process for a period of time long enough to thoroughly acquaint the person with all facets of the process.
- (38) F.O.P.S. – falling object protective structure.
- (39) Fair lead – sheaves, rolls, or a combination thereof arranged to receive a line coming from any direction for proper line spooling on to a drum.
- (40) Front end loader – a mobile machine mounted on a wheeled or tracked chassis, equipped with a grapple, tusk, bucket, or fork-lift device, and employed in the loading, unloading, stacking, or sorting of logs or materials.
- (41) Guard rail – a railing to restrain a person.
- (42) Guyline – a line used to support or stabilize a spar.
- (43) Gypsy drum – a mechanical device wherein the line is not attached to the drum and is manually spooled to control the line movement on and off the drum.
- (44) Haulback – a line used to pull the buttrigging and mainline to the logs to be yarded.
- (45) Haulback block – any block the haulback line passes through including the corner block and tailblock.
- (46) Hay rack –
- (a) A type of loading boom where two tongs are used and logs are suspended.
- (b) A transporting vehicle with multiple sets of bunks attached to a rigid frame usually used for hauling logs.
- (47) Hazardous falling area – the area within a circle centered on the tree being felled and having a radius not less than twice the height of that tree.
- (48) Head tree – the tree where yarding and/or loading takes place. (See spar tree)
- (49) Heel boom – a type of loading boom where one tong is used and one end of the log is pulled up against the boom.
- (50) High lead – a system of logging wherein the main line is threaded through the main line block, which is attached near the top of the spar, to obtain a lift of the logs being yarded.
- (51) Hobo log and/or hitchhiker – a free or unattached log that is picked up by a turn and is transported with the turn.
- (52) Hooktender – the worker that supervises the method of moving the logs from the woods to the landing.
- (53) Hot deck – a landing where logs are being moved.
- (54) Hydraulic jack – a mechanical device, powered by internal pressure, used to control the direction in which a tree is to be felled.
- (55) In the clear – being in a position where the possibility of harmful physical contact is minimized.

(56) Jackstrawed – trees or logs piled in an unorderly manner.

(57) Jiggers – any projecting broken wire in a strand of cable.

(58) Kerf – that portion of timber products taken out by the saw teeth.

(59) Knob – a metal ferrule attached to the end of a line.

(60) Landing – any place where logs are laid after being yarded, awaiting subsequent handling, loading, and hauling.

(61) Lift tree – an intermediate support for skylines.

(62) Loading boom – any structure projecting from a pivot point to guide a log when lifted.

(63) Lodged tree – a tree leaning against another tree or object which prevents it from falling to the ground.

(64) Log bronco – a sturdily built boat usually from twelve to twenty feet in length, used to push logs or bundles of logs in a generally forward direction in booming and rafting operations.

(65) Log dump – a place where logs are removed from transporting equipment. It may be either dry land or water, parbuckled over a brow log or removed by machine.

(66) Logging machine – a machine used or intended for use to yard, move, or handle logs, trees, chunks, trailers, and related materials or equipment. This shall include self-loading log trucks only during the loading and unloading process.

(67) Logs – tree segments suitable for subsequent processing into lumber, pulpwood, or other wood products, including but not limited to poles, piling, peeler blocks and bolts.

(68) Log stacker – a mobile machine mounted on a wheeled or tracked chassis, equipped with a frontally mounted grapple, tusk, or forklift device, and employed in the loading, unloading, stacking, or sorting of logs.

(69) Long sticks – an overlength log that creates a hazard by exceeding the safe perimeters of the landing.

(70) Mainline – the line attached to the buttrigging used to pull logs to the landing.

(71) Mainline block – the block hung in the spar through which the mainline passes.

(72) Mainline train – any train that is made up for travel between the woods and log dump.

(73) Matchcutting – the felling of trees without using an undercut.

(74) Mechanized falling – falling of standing timber by a self-propelled mobile wheeled or tracked machine equipped with a shear or other powered cutting device.

(75) Mechanized feller – any such machine as described in WAC 296-54-535 and 296-54-537, and includes feller/bunchers and similar machines performing multiple functions.

(76) Mobile log loader – a self-propelled log loading machine mounted on wheels or tracks, incorporating a grapple-rigged Bohemian, goose neck, or straight boom fabricated structure, employed in the loading or unloading of logs by means of grapples or tongs.

(77) Mobile yarder – a logging machine mounted on wheels, tracks, or skids, incorporating a vertical or inclined spar, tower, or boom, employed in skyline, slackline, high lead, or grapple overhead cable yarding systems.

(78) Must – the same as "shall" and is mandatory.

(79) New area or setting – a location of operations when both the loading station and the yarder are moved.

(80) Pass line – a small line threaded through a block at the top of the spar to assist the high climber.

(81) Permissible (as applied to any device, equipment or appliance) – such device, equipment, or appliance has the formal approval of the United States Bureau of Mines, American Standards Association, or National Board of Fire Underwriters.

(82) Portable spar or tower – a movable engineered structure designed to be used in a manner similar to which a wood spar tree would be used.

(83) Qualified person – a person, who by possession of a recognized degree, certificate, professional standing, or by extensive knowledge, training, and experience, has successfully demonstrated ability to solve or resolve problems relating to the subject matter, the work, or the project.

(84) Reach – a steel tube or wood timber or pole connected to the truck and inserted through a tunnel on the trailer. It steers the trailer when loaded and pulls the trailer when empty.

(85) Receding line – the line on a skidder or slackline comparable to the haulback line on a yarder.

(86) Reload – an area where logs are dumped and reloaded or transferred as a unit to another mode of transportation.

(87) Rollway – any place where logs are dumped and they roll or slide to their resting place.

(88) R.O.P.S. – roll over protection structure.

(89) Rub tree – a tree used to guide a turn around a certain area.

(90) Running line – any line which moves.

(91) SAE – society of automotive engineers.

(92) Safety factor – the ratio of breaking strength to a safe working strength or loading.

(93) Safety glass – a type of glass that will not shatter when broken.

(94) Sail block – a block hung inverted on the sail guy to hold the tong block in proper position.

(95) Scaler – the person who measures the diameter and length of the logs, determines specie and grade, and makes deductions for footage calculations.

(96) Shall – a requirement that is mandatory.

(97) Shear log – a log placed in a strategic location to divert passage of objects.

(98) Shore skids – any group of timbers spaced a short distance apart on which logs are rolled.

(99) Signal person – the person designated to give signals to the machine operator.

(100) Siwash – to change the lead of a line with a physical object such as a stump or tree instead of a block.

(101) Skidder – a machine or animal used to move logs or trees to a landing.

- (102) Skidding – movement of logs or trees on the surface of the ground to the place where they are to be loaded.
- (103) Skyline – the line suspended between two points on which a block or carriage travels.
- (104) Slackline – a form of skyline where the skyline cable is spooled on a donkey drum and can be raised or lowered.
- (105) Slack puller – any weight or mechanical device used to increase the movement of a line when its own weight is inadequate.
- (106) Snag – a dead standing tree or a portion thereof. (See Danger tree)
- (107) Snorkel – a loading boom modified to extend its limitations for the purpose of yarding.
- (108) Spar – a device rigged for highlead, skyline or slackline yarding.
- (109) Spar tree – (see spar).
- (110) Speeder – a small self-powered vehicle that runs on a railroad track.
- (111) Spike – a long heavy nail similar to a railroad spike.
- (112) Springboard – a board with an iron tip used by fallers to stand on while working above ground level.
- (113) Square lead – the angle of 90 degrees.
- (114) Squirrel – a weight used to swing a boom when the power unit does not have enough drums to do it mechanically.
- (115) Squirrel tree – a topped tree, guyed if necessary, near the spar tree in which the counter balance (squirrel) of a tree rigged boom is hung.
- (116) Stiff boom – two or more boom sticks wrapped together on which boom persons walk or work.
- (117) Strap – any short piece of line with an eye or "D" in each end.
- (118) Strawline – a small line used for miscellaneous purposes.
- (119) Strap socket or D – a socket with a closed loop and arranged to be attached to the end of a line by the molten zinc, or an equivalent method. It is used in place of a spliced eye.
- (120) Strip – a definite location of timber on which one or more cutting crews work.
- (121) Swamping – the falling or cutting of brush around or along a specified place.
- (122) Swifter – a piece of equipment used to tie the side sticks of a log raft together to keep the raft from spreading.
- (123) Swing cut – a back cut in which the holding wood on one side is cut through.
- (124) Tail block – the haulback block at the back end of the show.
- (125) Tail hold – an anchor used for making fast any line or block.
- (126) Tail tree – the tree at the opposite end from the head tree on which the skyline or other type rigging is hung.
- (127) Tight line – when either the mainline or haulback are held and power is exerted on the other or when power is exerted on both at the same time.
- (128) Tong line block – the block hung in a boom through which the tong line operates.
- (129) Tongue – a device used to pull and/or steer a trailer.
- (130) Topping – cutting off the top section of a standing tree prior to rigging the tree for a spar or tail tree.
- (131) Tower – (see portable spar or tower).
- (132) Tractor – a machine of wheel or track design used in logging.
- (133) Tractor logging – the use of any wheeled or tracked vehicle in the skidding or yarding of logs.
- (134) Transfer (as used in loading) – changing of logs in a unit from one mode of transportation to another.
- (135) Tree jack – a grooved saddle of wood or metal rollers contained within two steel plates, attached to a tree with a strap, used as a guide for skyline, sail guy, or similar static line. It is also formed to prevent a sharp bend in the line.
- (136) Tree plates – steel bars sometimes shaped as elongated J's, which are fastened near the top of a tree to hold guylines and prevent them from cutting into the tree when tightened. The hooks of the J are also used to prevent the mainline block strap from sliding down the tree.
- (137) Tree pulling – a method of falling trees in which the tree is pulled down with a line.
- (138) Tug – a boat, usually over twenty feet in length, used primarily to pull barges, booms of logs, bags of debris, or log rafts.
- (139) Turn – any log or group of logs attached by some means to power and moved from a point of rest to a landing.
- (140) "V" lead – a horizontal angle of less than 90 degrees formed by the projected lines of the mainline from the drum of the logging machine through the block or fairlead and the yarding load or turn.
- (141) WAC – Washington Administrative Code.
- (142) Waistline – that portion of the haulback running between the corner block and the tail block.
- (143) Wrapper – a cable assembly or chain used to contain a load of logs.
- (144) Wrapper rack – barrier used to protect a person while removing binders and wrappers from a loaded logging truck.
- (145) Yarder – a machine with a series of drums used to yard logs. (See donkey)
- (146) Yarding – the movement of logs from the place they are felled to a landing.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-54-505, filed 11/30/87. Statutory Authority: RCW 49.17-.040, 49.17.050, 49.17.240, chapters 43.22 and 42.30 RCW. 80-11-057 (Order 80-15), § 296-54-505, filed 8/20/80. Statutory Authority: RCW 49.17.040, 49.17.150 and 49.17.240. 79-10-081 (Order 79-14), § 296-54-505, filed 9/21/79.]

WAC 296-54-559 Yarding--Helicopters and helicopter cranes. (1) Helicopters and helicopter cranes shall comply with any applicable regulations of the Federal Aviation Administration.

(2) Prior to each day's operation, a briefing shall be conducted. This briefing shall set forth the plan of operation for the pilot and ground personnel.

(3) A take-off path from the log pickup point shall be established, and shall be made known to all workers in that area before the first turn of logs is moved.

(4) The helicopter flight path to and from the drop zone shall be designated and no equipment or personnel (other than flight personnel necessary to assist landing and take-off) will occupy these areas during helicopter arrival or departure.

(5) The approach to the landing shall be clear and long enough to prevent tree tops from being pulled into the landing.

(6) The helicopter shall not pass over an area in which cutters are working at a height which would cause the rotor wash to inhibit a cutter's ability to safely control a tree or dislodge limbs.

(7) Drop zones shall be twice the nominal length of logs to be landed.

(8) The drop zone shall be no less than one hundred twenty-five feet from the loading or decking area.

(9) Separate areas shall be designated for landing logs and fueling the helicopter(s).

(10) The yarding helicopter shall be equipped with a siren to warn workers of any hazardous situation.

(11) Workers shall remain in the clear as chokers are being delivered, and under no circumstances will workers move under the helicopter that is delivering the chokers or take hold of the chokers before they have been released by the helicopter.

(12) Log pickup shall be arranged in a manner that the hook up crew will not work on slopes below felled and bucked timber.

(13) If the load must be lightened, the hook shall be placed on the ground on the uphill side of the turn before the hooker approaches to release the excess logs.

(14) Landing crew shall be in the clear before logs are dropped.

(15) One end of all the logs in the turn shall be touching the ground and lowered to an angle of not more than 45° from the horizontal before the chokers are released.

(16) Logs shall be laid on the ground and the helicopter will be completely free of the choker(s) before workers approach the logs.

(17) If the load will not release from the hook, the load and the hook shall be on the ground before workers approach to release the hook manually.

(18) Loads shall be properly slung. Tag lines shall be of a length that will not permit their being drawn up into rotors. Pressed sleeve, swaged eyes, or equivalent means shall be used for all freely suspended loads to prevent hand splices from spinning open or cable clamps from loosening.

(19) All electrically operated cargo hooks shall have the electrical activating device so designed and installed as to prevent inadvertent operation. In addition, these cargo hooks shall be equipped with an emergency mechanical control for releasing the load. The hooks shall be tested prior to each day's operation to determine that

the release functions properly, both electrically and mechanically.

(20)(a) Personal protective equipment for employees receiving the load shall consist of complete eye protection and hard hats secured by chinstraps, and high visibility vests or outer garments.

(b) Loose-fitting clothing likely to flap in the downwash, and thus be snagged on hoist line, shall not be worn.

(21) Every practical precaution shall be taken to provide for the protection of employees from flying objects in the rotor downwash. All loose gear within one hundred feet of the place of lifting of the load, depositing the load, and all other areas susceptible to rotor downwash shall be secured or removed.

(22) Good housekeeping shall be maintained in all helicopter loading and unloading areas.

(23) The helicopter operator shall be responsible for size, weight, and manner in which loads are connected to the helicopter. If, for any reason, the helicopter operator believes the lift cannot be made safely, the lift shall not be made.

(24) Employees shall not perform work under hovering craft except for that limited period of time necessary to guide, secure, hook and unhook loads. Regardless of whether the hooking or unhooking of a load takes place on the ground or other location in an elevated work position in structural members, a safe means of access and egress, to include an unprogrammed emergency escape route or routes, shall be provided for the employees hooking or unhooking loads.

(25) Static charge on the suspended load shall be dissipated with a grounding device before ground personnel touch the suspended load, or protective rubber gloves shall be worn by all ground personnel touching the suspended load.

(26) The weight of an external load shall not exceed the manufacturer's rating.

(27) Hoist wires or other gear, except for pulling lines or conductors that are allowed to "pay out" from a container or roll off a reel, shall not be attached to any fixed ground structure, or allowed to foul on any fixed structure.

(28) When visibility is reduced by dust or other conditions, ground personnel shall exercise special caution to keep clear of main and stabilizing rotors. Precautions shall also be taken by the employer to eliminate as far as practical reduced visibility.

(29) Signal systems between aircrew and ground personnel shall be understood and checked in advance of hoisting the load. This applies to either radio or hand signal systems. Hand signals shall be as shown in Figure 6.

(30) No unauthorized person shall be allowed to approach within fifty feet of the helicopter when the rotor blades are turning.

(31) Whenever approaching or leaving a helicopter with blades rotating, all employees shall remain in full view of the pilot and keep in a crouched position. Employees shall avoid the area from the cockpit or cabin

rearward unless authorized by the helicopter operator to work there.

(32) Sufficient ground personnel shall be provided, when required, for safe helicopter loading and unloading operations.

(33) There shall be constant reliable communication between the pilot, and a designated employee of the ground crew who acts as a signalperson during the period of loading and unloading. This signalperson shall be distinctly recognizable from other ground personnel.

(34) Open fires shall not be permitted in an area that could result in such fires being spread by the rotor downwash.

(35) Under no circumstances shall the refueling of any type helicopter with either aviation gasoline or Jet B (Turbine) type fuel be permitted while the engines are running.

(36) Helicopters using Jet A (Turbine-Kerosene) type fuel may be refueled with engines running provided the following criteria is met:

(a) No unauthorized persons shall be allowed within fifty feet of the refueling operation or fueling equipment.

(b) A minimum of one thirty-pound fire extinguisher, or a combination of same, good for class A, B and C fires, shall be provided within one hundred feet on the upwind side of the refueling operation.

(c) All fueling personnel shall be thoroughly trained in the refueling operation and in the use of the available fire extinguishing equipment they may be expected to utilize.

(d) There shall be no smoking, open flames, exposed flame heaters, flare pots or open flame lights within fifty feet of the refueling area or fueling equipment. All entrances to the refueling area shall be posted with "NO SMOKING" signs.

(e) Due to the numerous causes of static electricity, it shall be considered present at all times. Prior to starting refueling operations, the fueling equipment and the helicopter shall be grounded and the fueling nozzle shall be electrically bonded to the helicopter. The use of conductive hose shall not be accepted to accomplish this bonding. All grounding and bonding connections shall be electrically and mechanically firm, to clean unpainted metal parts.

(f) To control spills, fuel shall be pumped either by hand or power. Pouring or gravity flow shall not be permitted. Self-closing nozzles or deadman controls shall be used and shall not be blocked open. Nozzles shall not be dragged along the ground.

(g) In case of a spill, the fueling operation shall be immediately stopped until such time as the person-in-charge determines that it is safe to resume the refueling operation.

(h) When ambient temperatures have been in the 100 degree F. range for an extended period of time, all refueling of helicopters with the engines running shall be

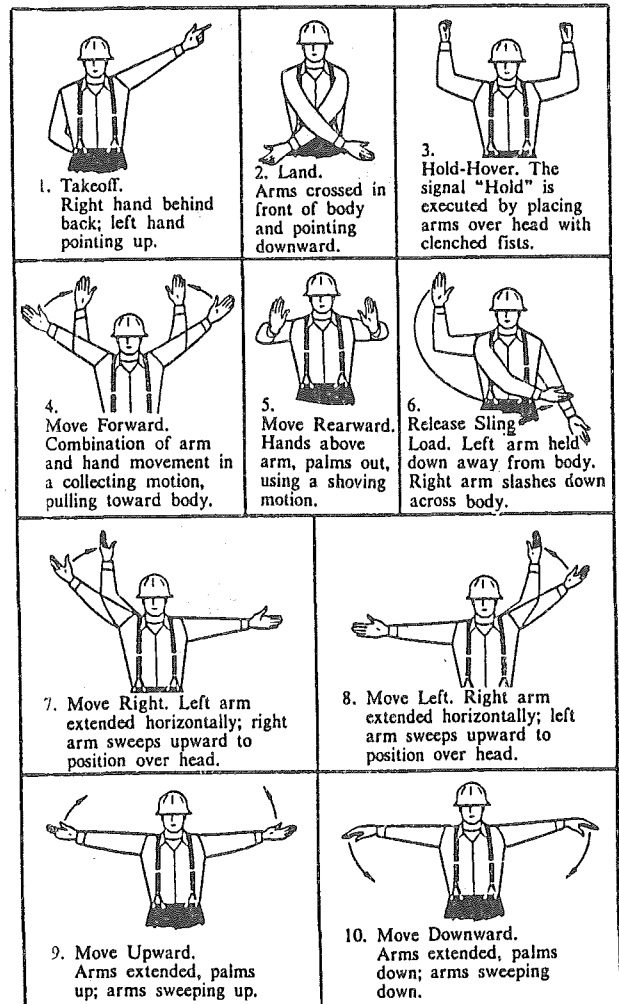
suspended until such time as conditions become suitable to resume refueling with the engines running.

(37) Helicopters with their engines stopped being refueled with aviation gasoline or Jet B (Turbine) type fuel, shall also comply with subsection (36)(a) through (g) of this section.

(38) Hook on persons in logging operations shall wear contrasting colored hard hats, with chinstraps, and high visibility vests or outer garments to enable the helicopter operator to readily identify their location.

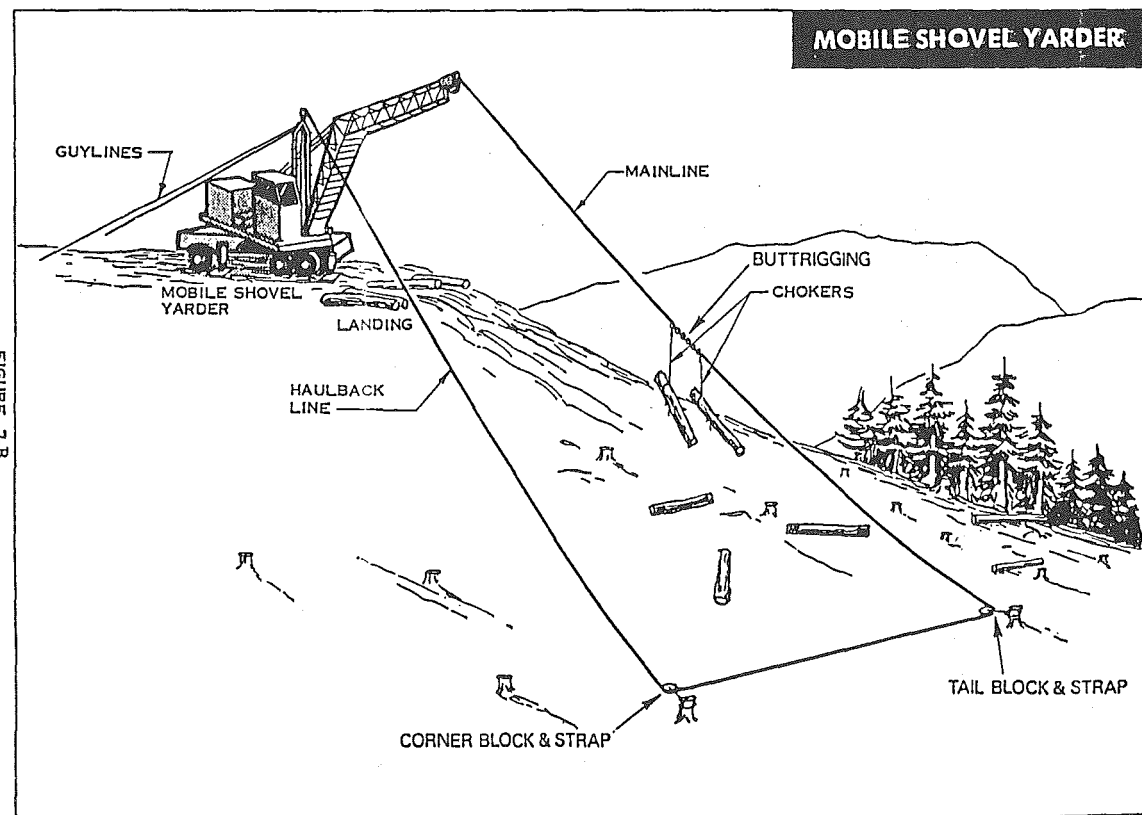
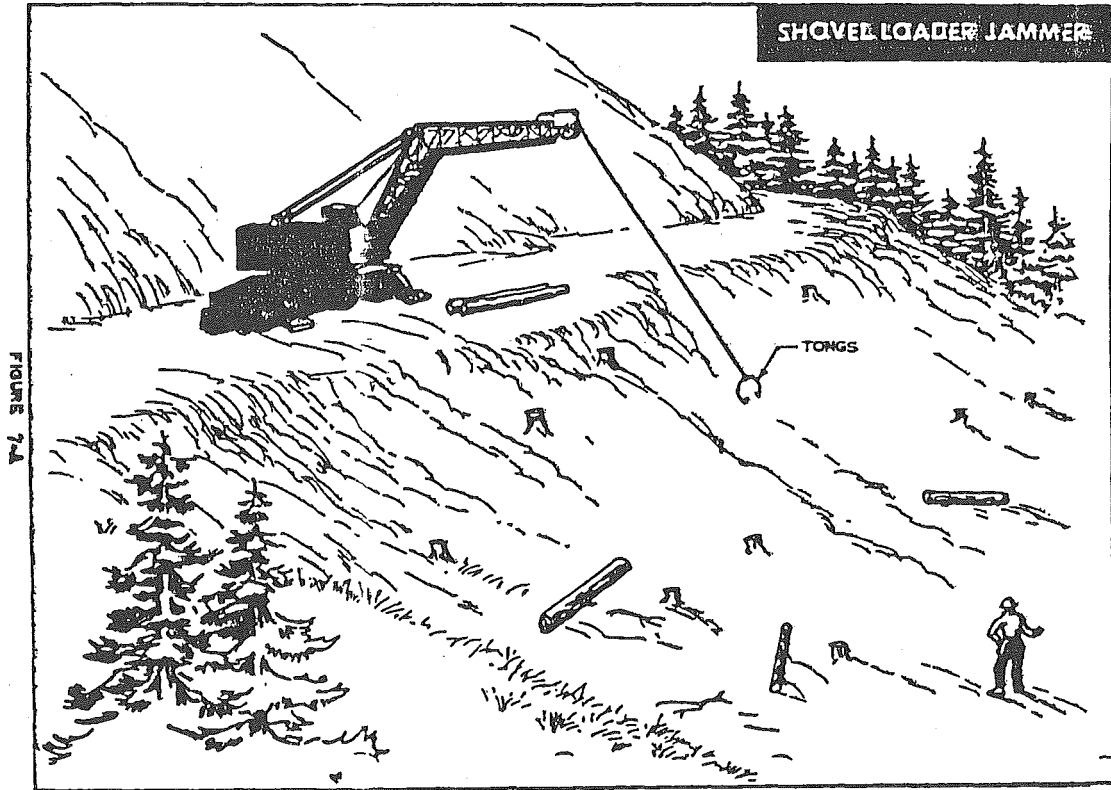
(39) Riding the load or hook of a helicopter is prohibited except in the case of an emergency with the proper safety gear.

HELICOPTER HAND SIGNALS



Note: See Figures No. 7-A through 7-P, for illustrations of various types of cable logging systems.

See Figures No. 7-Q through 7-U, for illustrations of whistle signals used on various cable logging systems.



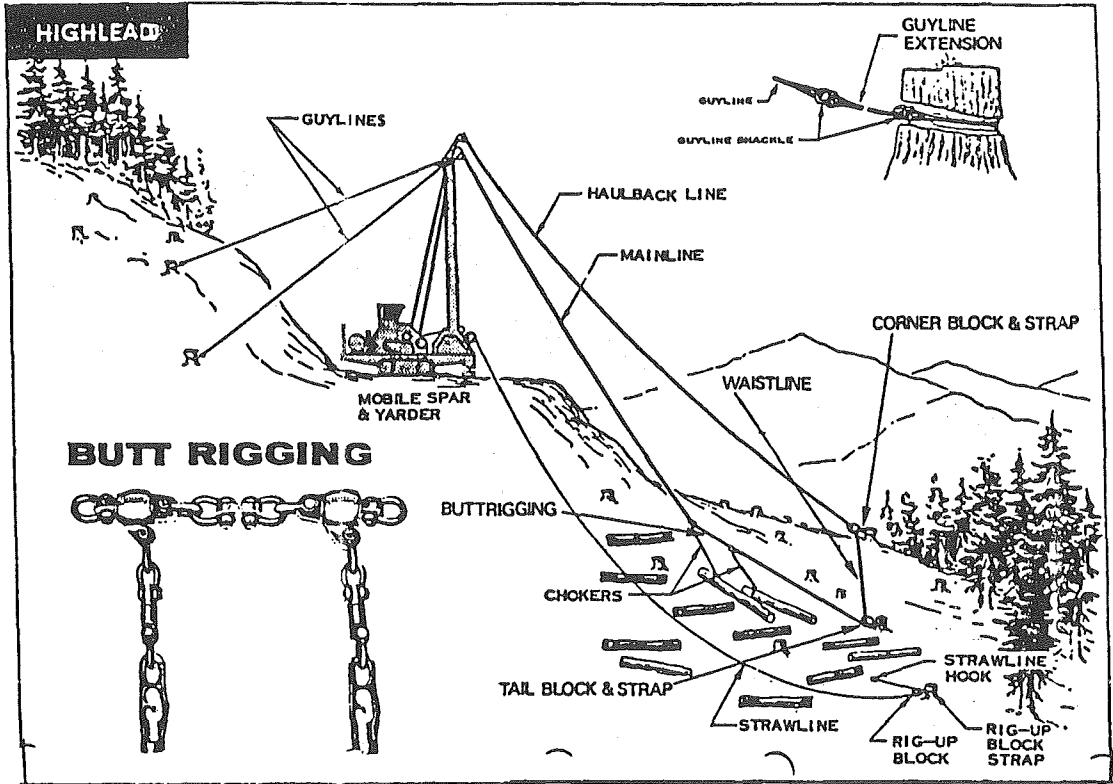


Figure 7.C

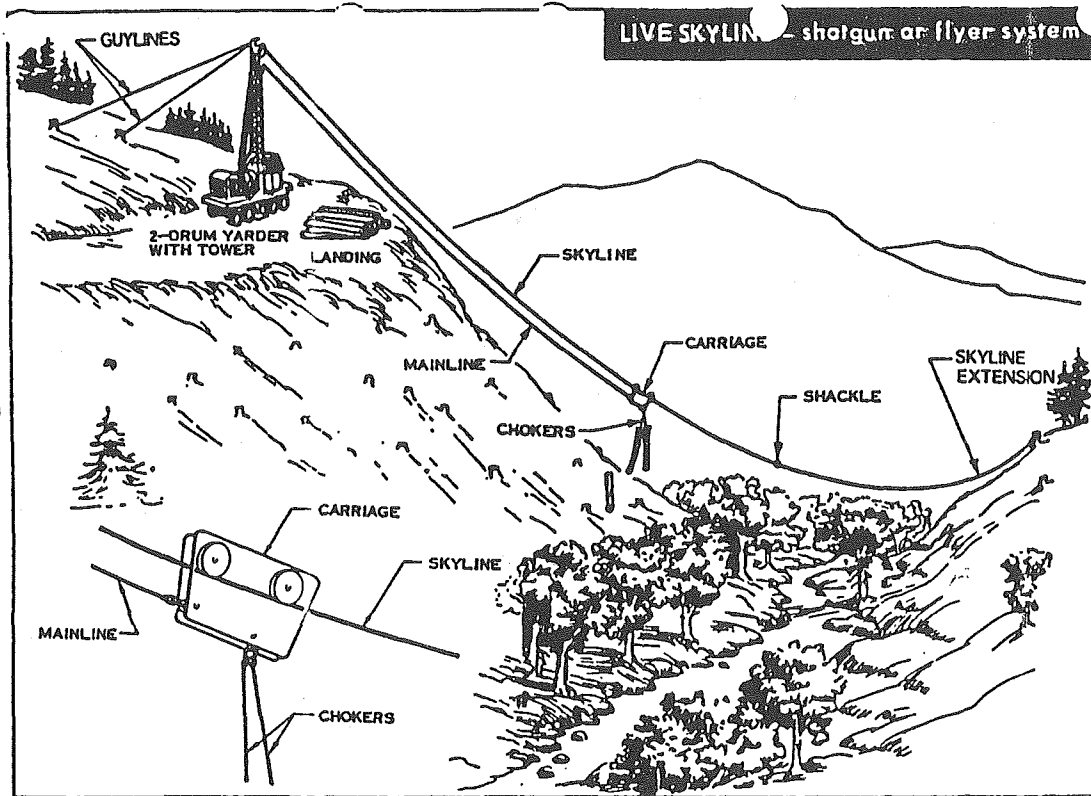
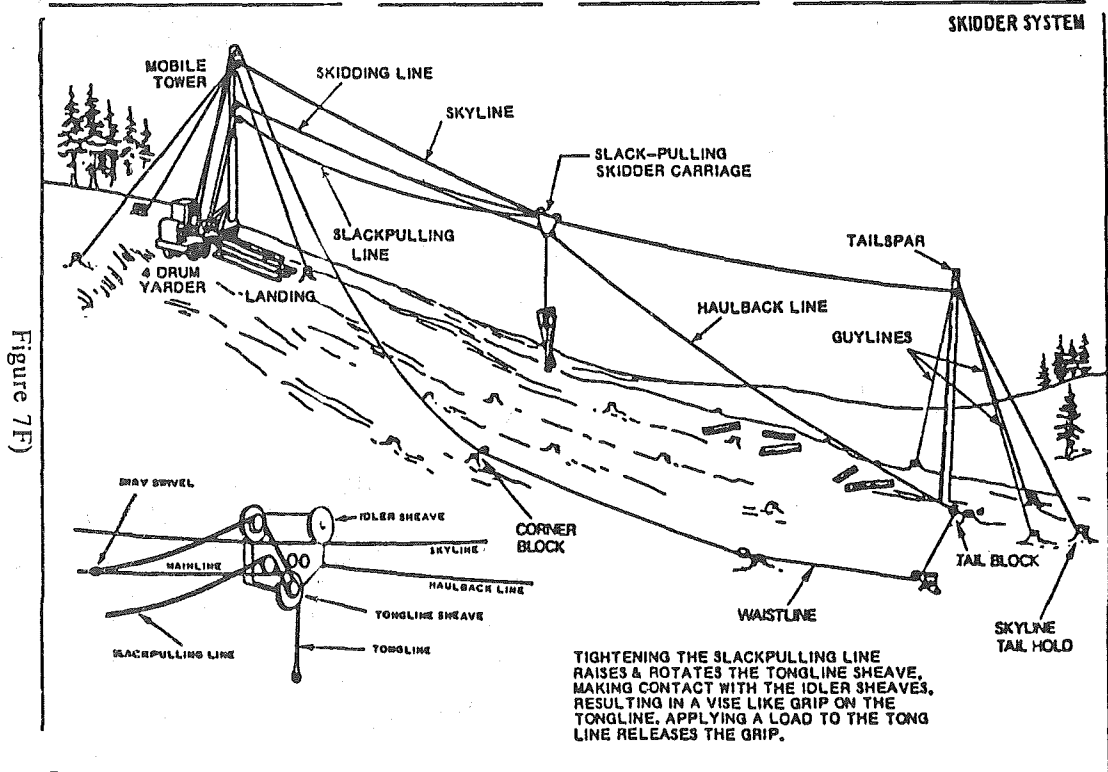
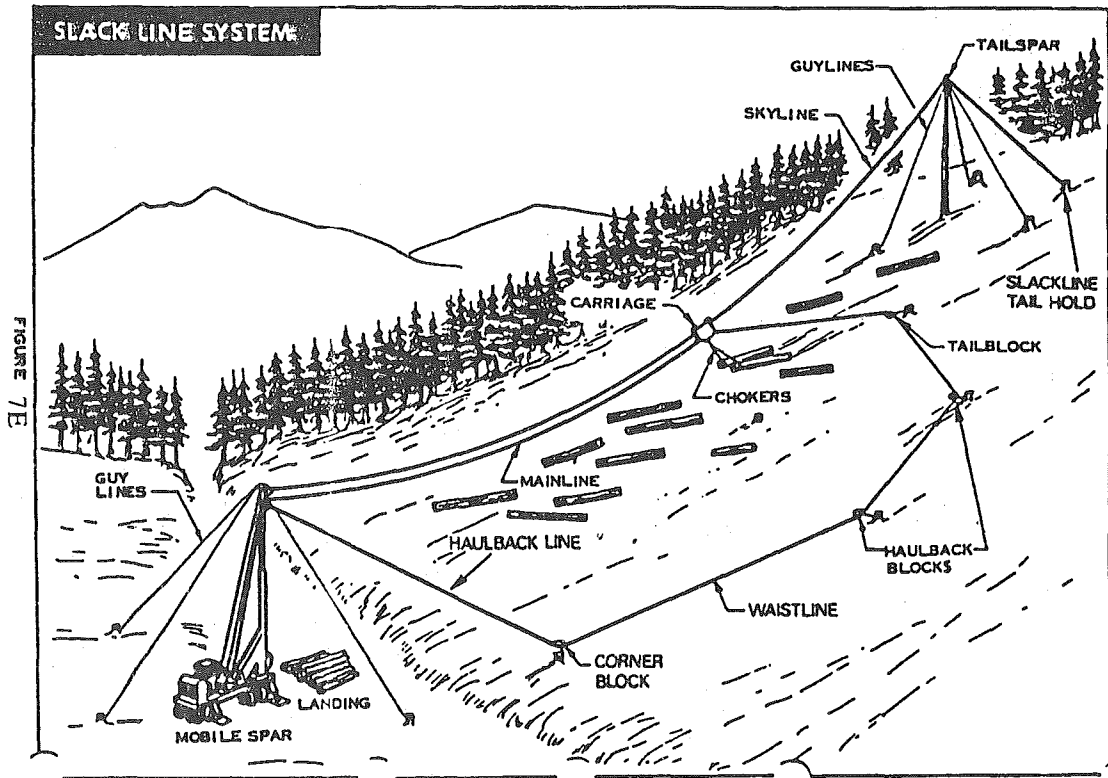
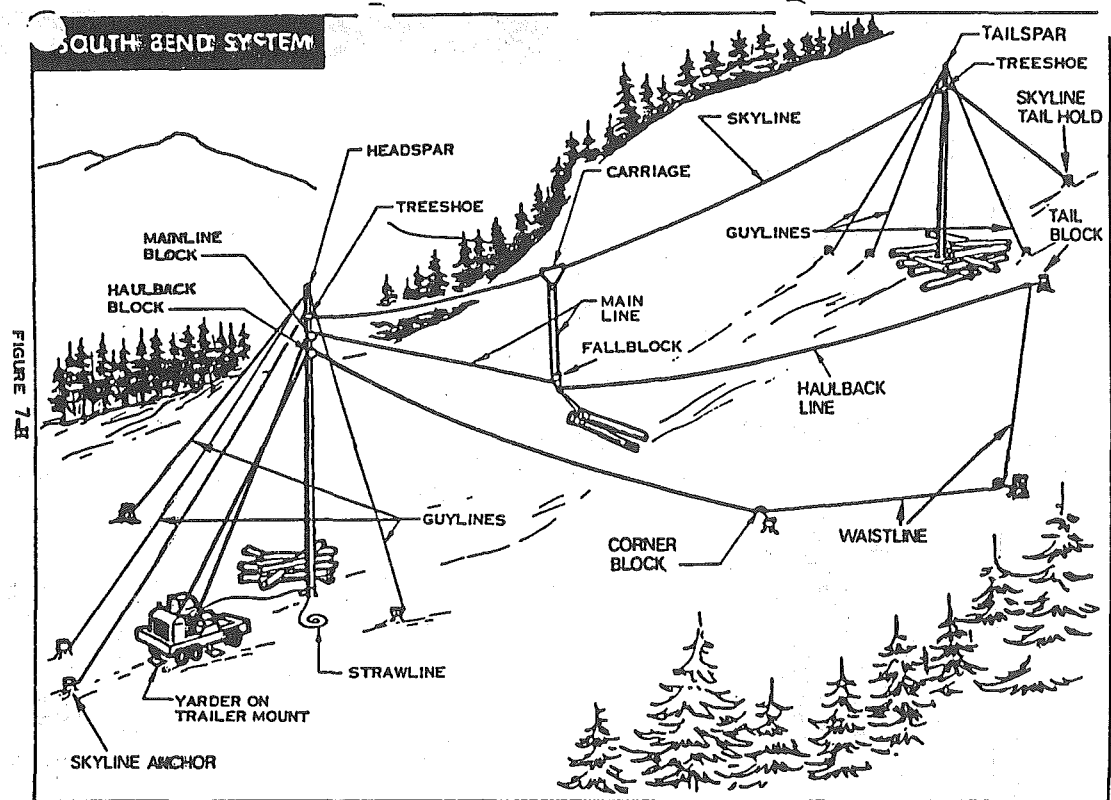
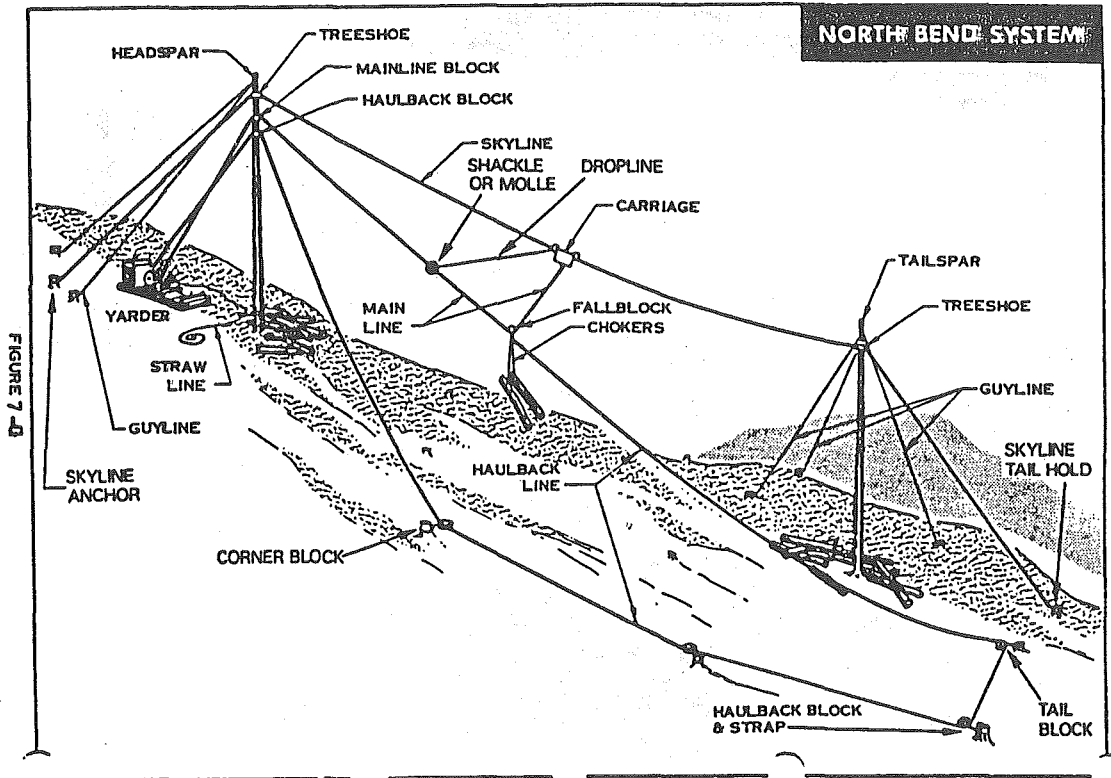


Figure 7.D





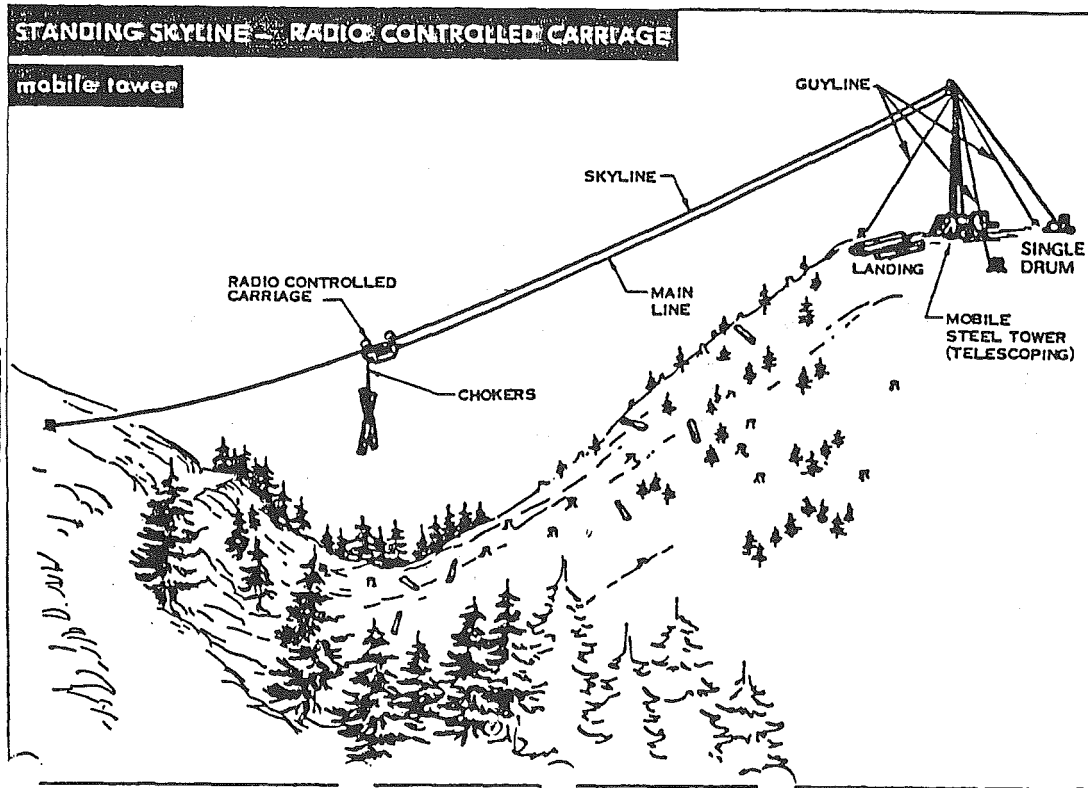


Figure 71

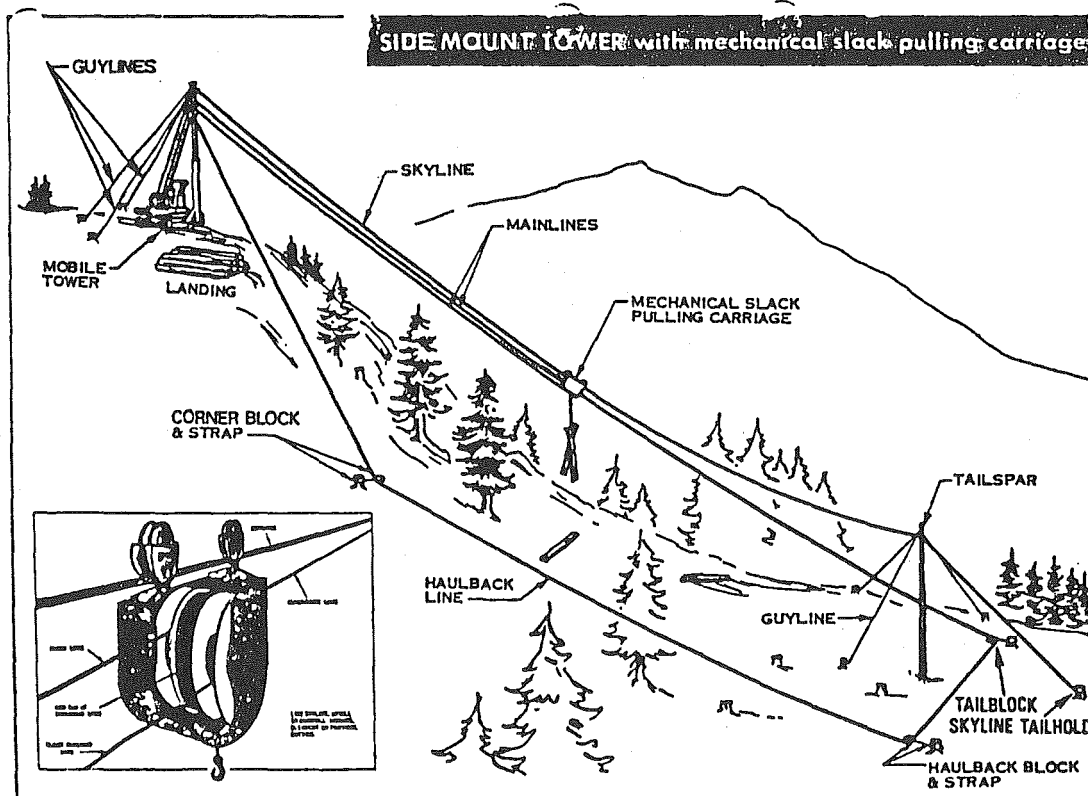


Figure 73

PARTIAL CUTTING WITH RUNNING SKYLINE

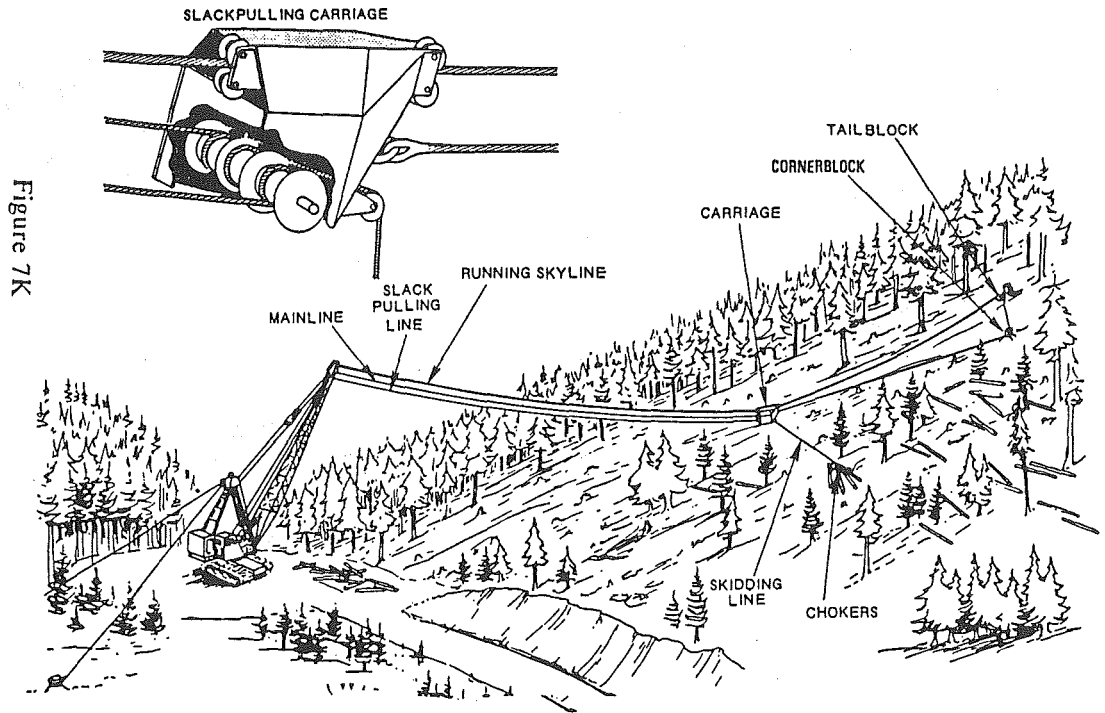


Figure 7K

RUNNING SKYLINE with chokers (GRABINSKI)

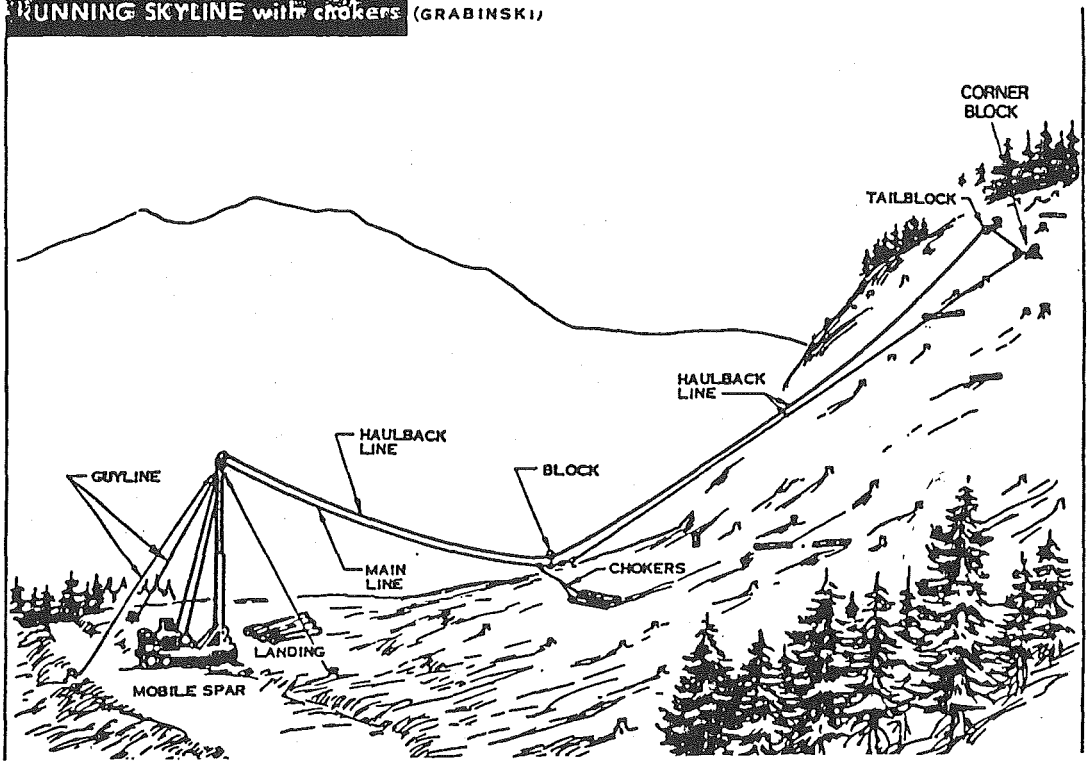
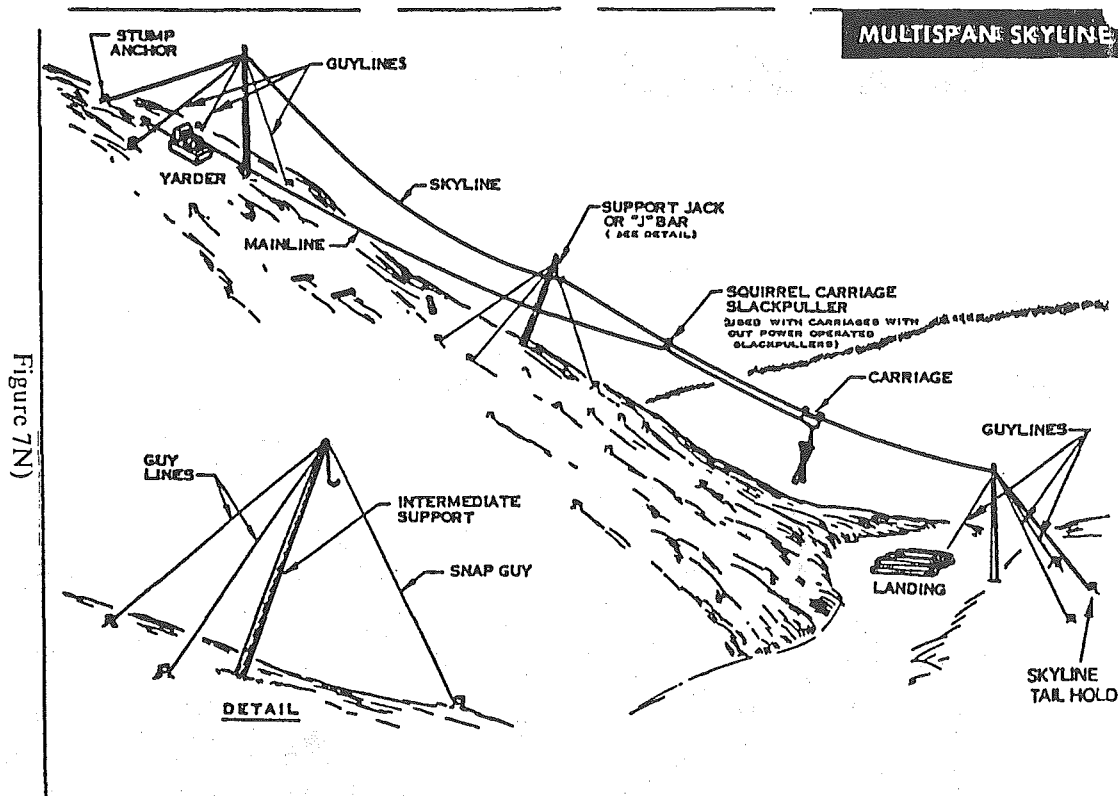
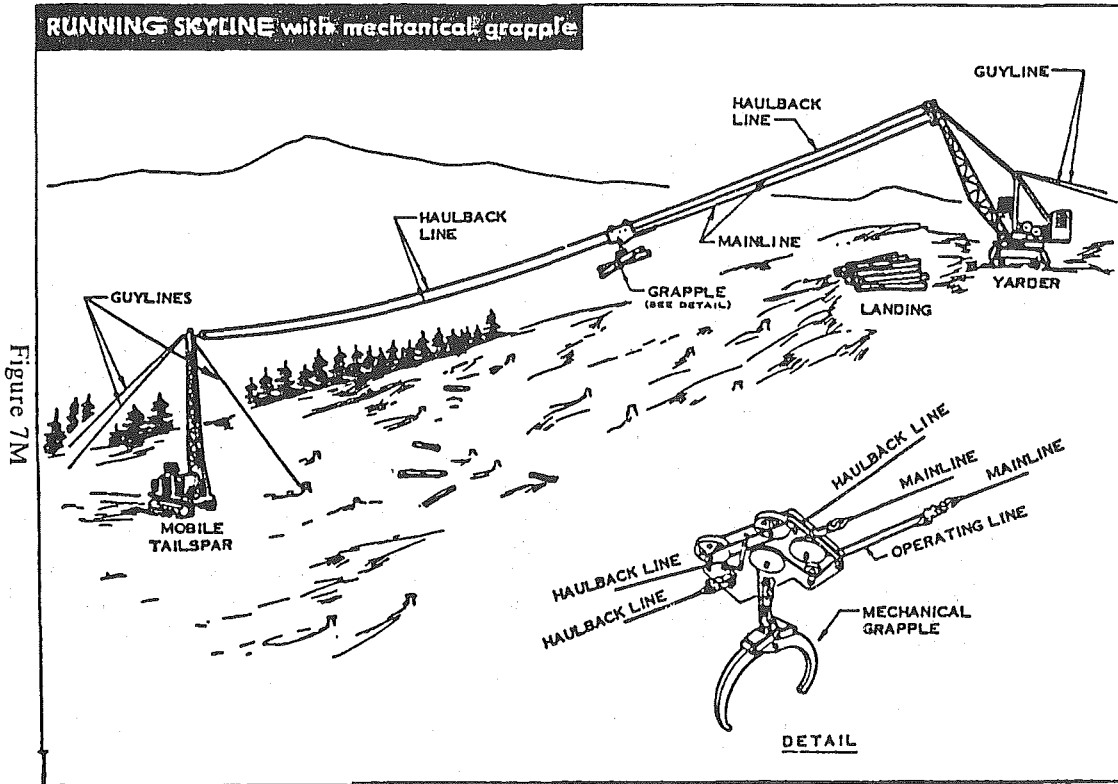
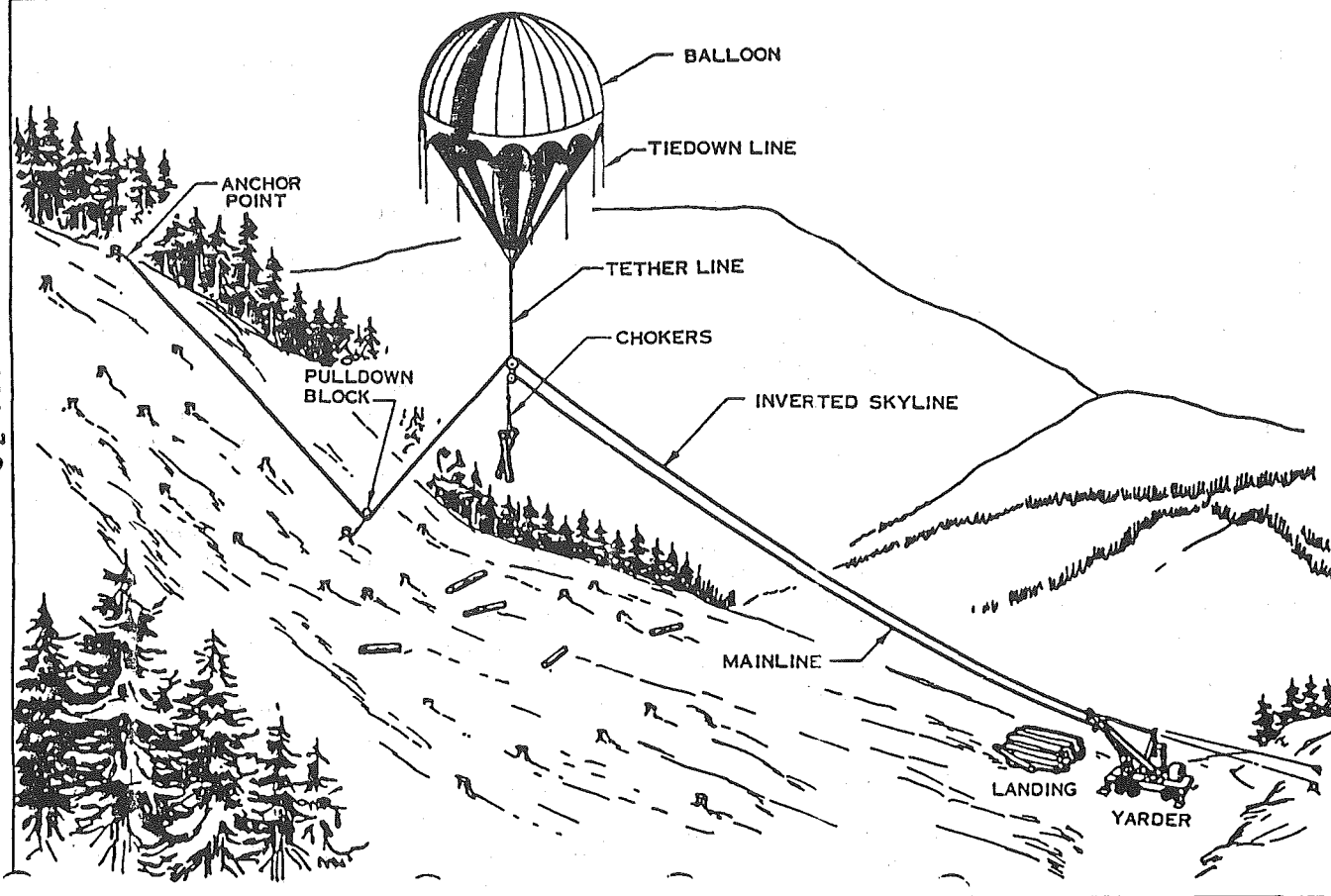


Figure 7L



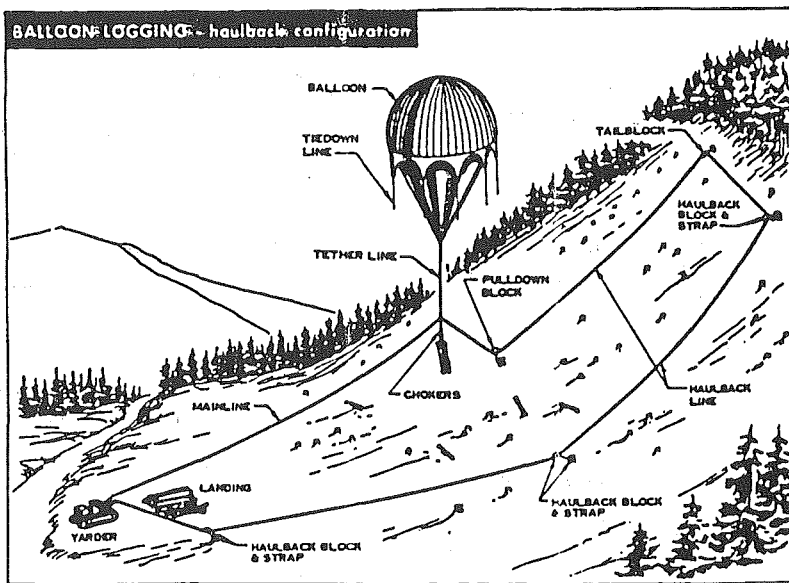
BALLOON LOGGING - inverted skyline configuration

FIGURE 7-0



BALLOON LOGGING - haulback configuration

Figure 7-P



HIGH LEAD LOGGING WHISTLE SIGNALS
 - Means longer spacing between signals.

1 short	Stop all lines.
3 short-3 short	Ahead slow on mainline.
3 short	Ahead on mainline.
2 short	Ahead on haulback.
2 short-2 short	Ahead slow on haulback.
3 short-1 short	Ahead on strawline.
3 short-1 short-3 short	Ahead slow on strawline.
4 short or more	Slack mainline.
2 short-4 short	Slack haulback.
3 short-1 short-4 short	Slack strawline.
3 short-2 short	Standing tight line.
1 short-1 short	Tight line while lines are running, or break if running tight.
3 short	When rigging is in: Strawline back on haulback.
3 short / plus "X" number of shorts	When rigging is in: Indicates number of sections of strawline back on rigging.
3 short-1 short-2 short	Strawline back on rigging.
1 short	When rigging is in: Chaser inspect and repair rigging.
2 short	When rigging is in: No chokers back.
2 short-1 short / plus "X" number of shorts	Number of chokers back.
2 short-4 short	When rigging is in: Slack haulback-hold all lines until 2 short blown.
3 medium	Hooker.
3 medium-4 short	Hooker and his crew.
5 long	Climber.
4 long	Foreman.
1 long-1 short	Start or stop work.
7 long-2 short	Man injured, call transportation and stretcher.
1 long-1 short repeated	Fire.
Grabinski system	
2 short-1 short	Slack mainline and haulback together.
2 long	Take off or put on rider block.

Figure 7-Q

SKIDDER WHISTLE SIGNALS

- Means longer spacing between signals.

1 short	Stops moving carriage-stops or goes ahead on slack puller, as case may be, if carriage is stopped.
2 short	Go ahead on skidding line holding carriage.
1 short-2 short	Pick up skidding line, easy.
2 short-1 short	Shake up carriage to clear choker.

2 short-2 short	Ahead on receding line.
3 short	Ahead on carriage, holding at present level, using interlock.
3 short-3 short	Ahead easy on skidding line.
2 short-2 short-2 short	Slack skyline, cable down.
2 short-2 short-2 short-1 short	Pick up skyline, cable up.
2 short-2 short-4 short	Slack receding line.
2 short-4 short	Slack skidding line.
2 short-2 short-1 short	Tighten all lines.
1 short-4 short	Slack off slack puller.
1 short-2 short	Pick up slack puller when slack.
2 short-2 short / plus "X" number of shorts	When carriage is in: Number of chokers wanted.
2 short-2 short-1 long	Bull choker.
1 short	When carriage is in: Inspect butt rigging.
2 short-4 short / 1 short	For each additional ten feet of tong line.
1 long / plus "X" number of shorts	Number of coils of strawline wanted.
5 medium	Tail or second rigger.
5 medium-4 short	Tail or second rigger and his crew.
2 medium	Skidder head rigger.
3 medium-4 short	Hooker and his crew.
2 long	Ahead on transfer.
2 long-4 short	Slack transfer
1 short-3 short	Ahead on carriage with slack puller line.
1 long	Ahead on strawline.
1 long-4 short	Slack strawline.
1 long-3 short	Ahead easy on strawline.
5 long	Climber.
4 long	Foreman.
1 long-1 short	Start or stop work.
7 long-2 short	Man injured, call transportation and stretcher.
1 long-1 short repeated	Fire.

Figure 7-R

SLACKLINE WHISTLE SIGNALS

- Means longer spacing between signals.

2 short-2 short-2 short-1 short	First cable up when road has been changed and tail hold made fast.
2 short-2 short-2 short	Drop skyline.
1 short	Stop any moving line.
1 long	When logging, slack skyline.
2 short	Ahead on skyline.
1 long-2 short	Ahead easy on skyline.

3 short	Ahead on skidding line, holding haulback.
3 short-3 short	Ahead easy on skidding line with slack haulback.
4 short	Slack skidding line.
2 short-2 short / 2 short -2 short	Ahead easy on haulback with slack skidding line.
2 short-2 short	Ahead on haulback.
2 short-2 short-4 short	Slack haulback.
2 short / 3 short	Pick up skyline and skid.
2 short / 2 short-2 short	Pick up skyline and skin.
3 short-1 short	When carriage is in: Strawline back on haulback.
3 short-1 short-2 short	When carriage is in: Strawline back on carriage.
3 short-1 short	When strawline is out: Ahead on strawline.
3 short-2 short	Tight line.
3 short-1 short-4 short	Slack strawline.
3 short-1 short-3 short	Pull easy on strawline.
2 long	Ahead on transfer.
2 long-4 short	Slack transfer.
2 long-2 short-2 short	When carriage is in: Transfer back on carriage.
1 long / plus "X" number of shorts	When carriage is in: Number of coils.
2 short-2 short-1 short / plus "X" number of shorts	When carriage is in: Number of chokers.
1 short	When carriage is in: Inspect rigging, repair and send back.
2 short-2 short-4 short	When carriage is in: Slack haulback and hold all lines until 1 short is blown—then send back.
3 short-3 short	When carriage is in: Send back powder.
5 medium	Tail rigger.
5 medium-4 short	Tail rigger and his crew.
3 medium	Head hooker.
3 medium-4 short	Second hooker and his crew.
5 long	Climber.
4 long	Foreman.
1 long-1 short	Start or stop work.
7 long-2 short	Man injured, call transportation and stretcher.
1 long-1 short repeated	Fire.

Figure 7-S

RUNNING SKYLINE WHISTLE SIGNALS

- Means longer spacing between signals

1 short	Stop all moving lines
2 short	Skin carriage back
2 short-1 short	Slack haulback

2 short-2 short	Skin carriage easy
2 short-3 short	Standing tight line
1 short-2 short	Ahead on drop line
4 short	Slack drop line
1 short-4 short	Slack both mainlines
1 short-1 short	Stop drop line going up and move carriage forward
3 short	Move carriage forward
3 short-3 short	Move carriage forward easy
3 short-1 short	When strawline is out: Ahead on strawline
3 short-1 short-4 short	Slack strawline
3 short	When carriage is in: Strawline
3 short-X short	When carriage is in: Number sections
3 short-1 short-2 short	When carriage is in: Strawline back on carriage
2 short-X short	When carriage is in: Number of chokers
4 short	When carriage is in: Inspect rigging, repair and send back
1 short	When carriage is in: Hold all lines until 2 shorts, then send back
3 medium	Head hooker
3 medium-4 short	Hooker and his crew
4 long	Foreman
1 long-1 short	Start or stop work
7 long-2 short	Man injured; call transportation and stretcher
1 long-1 short (repeated)	Fire
3 short-1 long	Acknowledged by engineer to signify hazardous turn

Figure 7-T

TENSION SYSTEM SIGNALS

4	Release tension
1 short	Stop carriage and start unspooling tong line
1 short	Stop tong line
1 short	Resume unspooling tong line
1 short	Will stop any moving line or slack tong line when carriage is stopped
2 short-2 short	Go into interlock and go back
2 short-4 short	Slack haulback and let carriage down

After turn is set

2 short	Go ahead on tong line
2 short-3 short	Go ahead easy on tong line
3 short	Go into interlock and take carriage to landing
3 short-3 short	Ahead on carriage easy

1 short-2 short Increase tension on tong line when carriage is going in
 short-1 short Decrease tension on tong line when carriage is going in

Figure 7-U

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-54-559, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 81-05-013 (Order 81-3), § 296-54-559, filed 2/10/81. Statutory Authority: RCW 49.17.040, 49.17.150 and 49.17.240. 79-10-081 (Order 79-14), § 296-54-559, filed 9/21/79.]

WAC 296-54-605 Radio systems used for voice communication, activation of audible signals, or equipment.

(1) Every employer who uses a radio signaling or control system (voice or functions) shall comply with or exceed the minimum requirements specified in this section.

(2) A valid operating permit shall be obtained by the owner from the division of industrial safety and health, department of labor and industries, prior to putting into use any radio signaling or control system (voice or functions) intended to be used in conjunction with any type of cable logging operation. Permits will be issued only for systems licensed for such use and using those carrier frequencies as authorized by the Federal Communications Commission. In addition, permits will be granted only when tone or function frequencies are compatible with other radio systems in use and when in compliance with all other applicable requirements contained in this safety standard.

(3) The division of industrial safety and health reserves the right to designate the use of radio frequencies for certain purposes or functions, for example, certain frequencies may be used for voice transmission of instruction, others for tone coded functions, or activation of signaling devices. No single tone sets shall be permitted for logging purposes. The division may also designate which tone frequencies may be used for the activation of a signaling device or for control of equipment on certain federal communication assigned carrier frequencies.

(4) A list of tone frequencies which may be used with any Federal Communications Commission assigned carrier frequencies will be made available by the division of industrial safety and health to any interested person, firm, or corporation upon request.

(5) The division of industrial safety and health shall assign the area or areas in which a radio signaling system may be used and shall so mark on the permit. Radio signaling systems shall not be used in any area other than indicated on the permit. (See Figure 10 for map of areas.)

(6) The person or firm name on the permit shall be the same as the person or firm operating the radio signaling system except for loaner or rental sets. A person or firm using a loaner or rental set shall be responsible for the radio signal system as if they were the owner of the set. The application for a permit to use a radio signaling system shall contain the following information:

- (a) Name and address of applicant.

- (b) The radio frequencies of the radio signaling device in MHz.

- (c) The tone frequency or frequencies of the radio signaling system used to activate a horn, whistle, or control equipment in Hz. The security gate, or pulse tone, shall be shown first.

- (d) The name of the manufacturer of the radio signaling system.

- (e) The serial number of the receiving unit.

- (f) The state assigned area or location in which the unit will operate.

- (g) Indicate type of signaling used.

- (h) From whom the system was purchased or acquired, and the date of acquisition of the system.

- (i) Intended use and function of system.

(7) The permit granted by the department shall be attached to the case of the receiver of the radio signaling system for which it is granted.

(8) Each radio receiver shall have its radio carrier frequency in MHz and tone frequency(s) in Hz indicated on the outside case of the receiver. The manufacturer's name and serial number shall also be permanently indicated on the outside of the case. When the duration or width of the tone frequencies performs a function, the one duration/width shall also be permanently indicated on the outside of the receiver case. Each transmitter shall be identified with its receiver. Two or more receivers in operation simultaneously on the same tone frequency shall be prohibited.

(9) It shall be the responsibility of the owner of any radio signaling system to notify the division of industrial safety and health, department of labor and industries, immediately, if the signal system is:

- (a) Permanently retired (in what manner and date retired).

- (b) Sold (submit name and address of purchaser and date sold).

- (c) Removed from the state (name of state to which moved and date moved).

- (d) Stolen (date).

(10) Two operable transmitters shall be carried by separate individuals at the point where chokers are being set at all times when transmitters are being used for tone signaling by persons around the live rigging in the choker setting area. Only one radio transmitter shall be required if in the possession of a signperson who has no other duties and remains in an area where there are no hazards created by the moving rigging or logs. If the total crew consists of a yarder operator and one person in the rigging, only one transmitter is required provided a positive system is instituted and used to check on the well-being of the person in the rigging.

(11) When interference, overlap, fadeout, or blackout of radio signals is encountered, the use of the device shall be discontinued immediately. The use of the device shall not be resumed until the source of trouble has been detected and corrected.

(12) All radio signaling systems put into use for the first time after the effective date of these safety standards, shall meet or exceed the minimum performance specifications contained in WAC 296-54-607 of these

safety standards, and, when altered or repaired, shall continue to meet such specifications.

(13) At least one make and model of each signaling system shall be tested and certified that it meets or exceeds the minimum requirements for performance as specified in WAC 296-54-607. A copy of such performance report shall be signed by the person or persons who tested the unit or components and shall be sent to the Division of Industrial Safety and Health, Department of Labor and Industries, P.O. Box 207, Olympia, Washington 98504.

(14) Radio equipment shall not be used without displaying a permit as required by this standard. The permit shall be prominently displayed on the outside case of the receiver of the unit or, for radio controlled carriages, on the transmitter in the yarder.

(15) Adjustments, repairs, or alterations of radio signaling devices shall be done only by or under the immediate supervision and responsibility of a person holding a first-class or second-class commercial radio operator's license, either radio-telephone or radio-telegraph, issued

by the Federal Communications Commission. Persons who do not possess the technical ability or do not have the proper equipment to cause the signaling systems to function within required tolerances shall not attempt to repair, alter, or adjust such systems.

(16) Radio frequencies assigned to systems for which voice communications may be used to give signals to the yarder operator, shall not be the same frequencies as those assigned for whistle signals used in skyline, highlead, slackline, or cable skidder systems.

(17) When hazardous interference is created by moving a voice communication system into an area where a system is already in use on the same frequency, use of the newly-moved system shall be immediately discontinued until the problem of interference has been corrected.

(18) Before moving any unit from one assigned geographical area to another (see area map, Figure 10 following this section), a new permit shall be applied for and secured from the Division of Industrial Safety and Health, Department of Labor and Industries, P.O. Box 207, Olympia, Washington 98504.

Form No. 157.

STATE OF WASHINGTON

5-71

DEPARTMENT OF LABOR AND INDUSTRIES

DIVISION OF SAFETY

APPLICATION FOR PERMIT TO OPERATE RADIO SIGNAL SYSTEM IN DESIGNATED AREA

Radio Carrier Frequency..... Serial No.....

Tone Coding Frequency..... Hz..... Name of Manufacturer of Signal System.....

Firm Name..... Address..... By.....

Intended Function of Unit: Voice communication Whistle signal Control Equipment

Area in which Unit will be Operated:..... 1 2 3 (Area map included in Safety Standards for Logging Operations)

Type of Tone: Sequential Simultaneous If other specify type.....

System to be Used For: Grapple Skyline, Highlead, Slackline, Skidder Balloon

System Purchased or Acquired From.....

Date System Purchased or Acquired: Day..... Month..... Year.....

Mail Permit to.....

Date Application Mailed to Division of Safety Day / Mo. / Year

Date Permit Issued Day / Mo. / Year DIV. OF SAFETY USE ONLY



Figure No. 10

STATE OF WASHINGTON
DEPT. OF LABOR & INDUSTRIES DIV. OF SAFETY

PERMIT #

TO OPERATE MULTI-TONE RADIO SIGNAL SYSTEM
IN DESIGNATED AREA.

Model Serial

Carrier Frequency MHz

Tones Hz

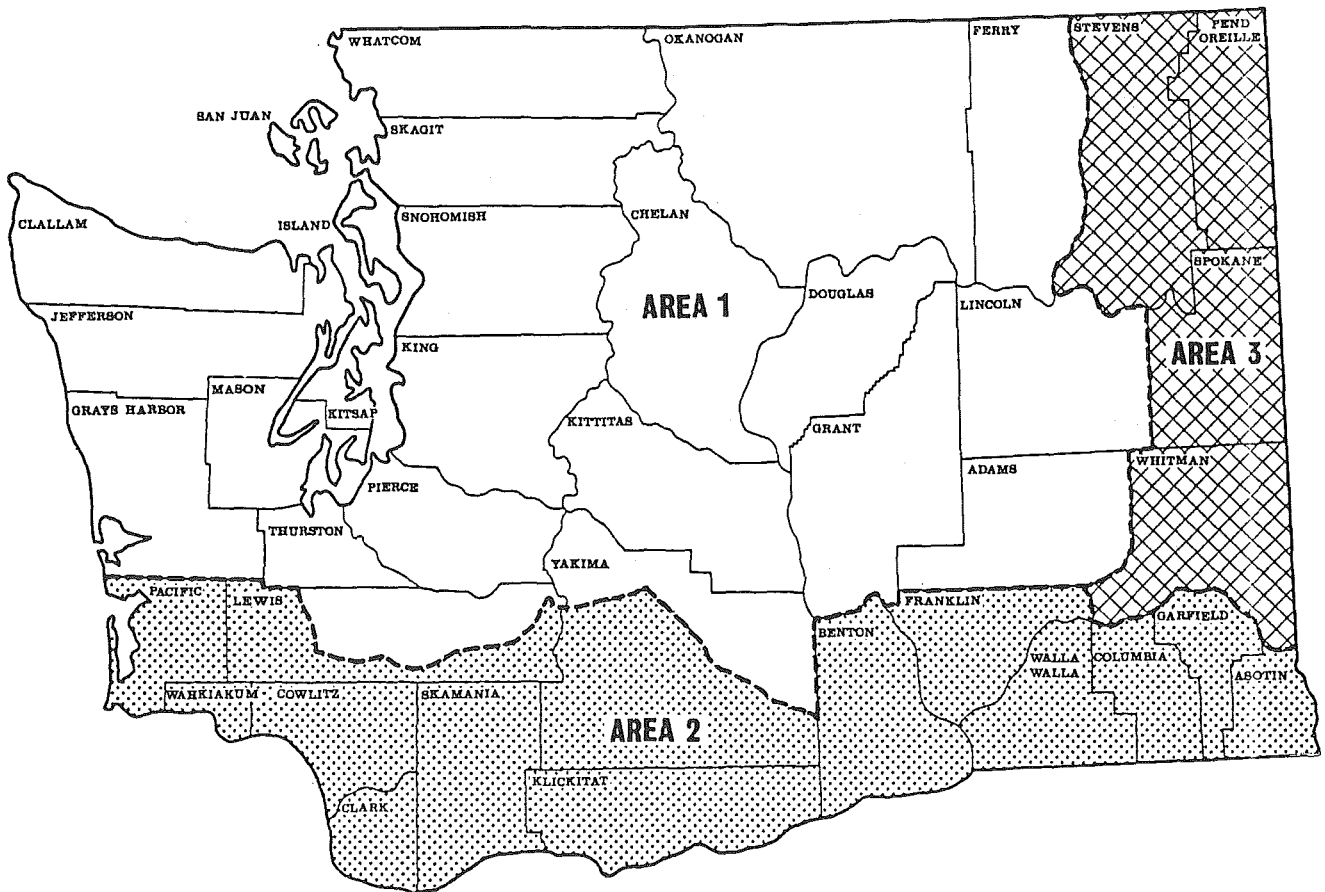
AREA

Firm Name

Issued by

S. F. No. 158-12.71-25C. 38416.

AREAS FOR USE OF RADIO SIGNALING SYSTEMS FOR LOGGING OPERATIONS



State of Washington
Department of Labor and Industries
Division of Industrial Safety and Health

A permit issued by the division of industrial safety and health shall be attached to the outside of the receiver which shall indicate the area in which the radio signaling equipment may be used.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-54-605, filed 11/14/88. Statutory Authority: RCW 49.17-.040, 49.17.150 and 49.17.240. 79-10-081 (Order 79-14), § 296-54-605, filed 9/21/79.]

WAC 296-54-990 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-54-99001 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-54-99005 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-54-99006 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-54-99011 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-54-99012 Repealed. See Disposition Table at beginning of this chapter.

Chapter 296-56 WAC

SAFETY STANDARDS--LONGSHORE, STEVEDORE AND RELATED WATERFRONT OPERATIONS

WAC

PART A--GENERAL

296-56-60001 Scope and applicability.

PART E--CARGO HANDLING GEAR AND EQUIPMENT

296-56-60081 Multipiece and single piece rim wheels.

PART K--RELATED TERMINAL OPERATIONS AND EQUIPMENT

296-56-60249 Petroleum docks.

PART A--GENERAL

WAC 296-56-60001 Scope and applicability. (1) The rules included in this chapter apply throughout the state of Washington, to any and all waterfront operations under the jurisdiction of the department of labor and industries, division of industrial safety and health.

(2) These minimum requirements are promulgated in order to augment the general safety and health standards, and any other safety and health standards promulgated by the department of labor and industries which are applicable to all places of employment under the jurisdiction of the department of labor and industries. The rules of this chapter, and the rules of chapters 296-24 and 296-62 WAC are applicable to all longshore, stevedore and related waterfront operations: *Provided*, That such rules shall not be applicable to those operations under the exclusive safety jurisdiction of the federal government.

(3) The provisions of this chapter shall prevail in the event of a conflict with, or duplication of, provisions

contained in chapters 296-24 and 296-62 WAC. Specific standards which are applicable include, but are not limited to:

(a) Electrical—WAC 296-24-956 through 296-24-960.

(b) Toxic and hazardous substances are regulated by chapter 296-62 WAC. Where references to this chapter are given they are for informational purposes only. Where specific requirements of this chapter conflict with the provisions of chapter 296-62 WAC this chapter prevails. Chapter 296-62 WAC does not apply when a substance or cargo is contained within a sealed, intact means of packaging or containment complying with the department of transportation or International Maritime Organization requirements.

(c) Hearing conservation—WAC 296-62-09015 through 296-62-09055.

(d) Standards for commercial diving operations—Chapter 296-37 WAC.

(e) Safety requirements for scaffolding—WAC 296-24-825 through 296-24-82545.

(f) Safe practices of abrasive blasting operations, ventilation—WAC 296-24-675 through 296-24-67519.

(g) Access to employee exposure and medical records—WAC 296-62-052 through 296-62-05221.

(h) Respiratory protection—WAC 296-62-071 through 296-62-07121.

(i) Safety rules for grain elevator operations—Chapter 296-88 WAC.

(j) Hazard communication—WAC 296-62-054 through 296-62-05427.

(k) Asbestos—WAC 296-62-07517.

(l) Confined space—WAC 296-62-145 through 296-62-14529.

(4) The provisions of this chapter do not apply to the following:

(a) Fully automated bulk coal handling facilities contiguous to electrical power generating plants.

(b) Facilities subject to the regulations of the office of pipeline safety regulation of the materials transportation bureau, department of transportation, to the extent such regulations apply.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-56-60001, filed 7/6/88. Statutory Authority: RCW 49.17-.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-56-60001, filed 1/17/86; 85-10-004 (Order 85-09), § 296-56-60001, filed 4/19/85; 85-01-022 (Order 84-24), § 296-56-60001, filed 12/11/84.]

PART E--CARGO HANDLING GEAR AND EQUIPMENT

WAC 296-56-60081 Multipiece and single piece rim wheels. Servicing of multipiece and single-piece rim wheels in marine terminal and other maritime work locations on large vehicles is regulated by requirements of WAC 296-24-21701.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-56-60081, filed 7/6/88. Statutory Authority: RCW 49.17-.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-56-60081, filed 1/17/86; 85-10-004 (Order 85-09), § 296-56-60081, filed 4/19/85; 85-01-022 (Order 84-24), § 296-56-60081, filed 12/11/84.]

PART K--RELATED TERMINAL OPERATIONS AND EQUIPMENT

WAC 296-56-60249 Petroleum docks. (1) Pipe lines which transport petroleum liquids from or to a wharf shall be equipped with valves on shore, so located as to be readily accessible and not endangered by fire on the wharf.

(2) Drip pans, buckets, or other means shall be provided and shall be used to prevent oil spillage upon wharves during loading, disconnecting and draining hoses. After transfer is completed the contents of drip pans and buckets shall be removed and taken to a place of disposal.

(3) Package goods, freight or ship stores shall not be swing-loaded or unloaded during the bulk handling of oils or other flammable liquids in such a manner that the swing-loads will endanger the hose.

(4) Water lights for use at petroleum wharves shall be a type which does not create a source of ignition.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-56-60249, filed 7/6/88. Statutory Authority: RCW 49.17-.040 and 49.17.050. 86-03-064 (Order 86-02), § 296-56-60249, filed 1/17/86; 85-01-022 (Order 84-24), § 296-56-60249, filed 12/11/84.]

Chapter 296-59 WAC

SAFETY STANDARDS FOR SKI AREA FACILITIES AND OPERATIONS

WAC

- 296-59-001 Foreword.
- 296-59-003 Scope and application.
- 296-59-005 Incorporation of other standards.
- 296-59-007 Definitions.
- 296-59-010 Safe place standards.
- 296-59-015 General requirements.
- 296-59-020 Management's responsibility.
- 296-59-025 Employee's responsibility.
- 296-59-027 Work activities which include skiing.
- 296-59-030 Safety bulletin board.
- 296-59-035 First-aid training and certification.
- 296-59-040 First-aid kits and supplies.
- 296-59-050 Personal protective equipment, general requirements.
- 296-59-055 Lockout requirements.
- 296-59-060 Vessel or confined area requirements.
- 296-59-065 Fire protection and ignition sources.
- 296-59-070 Illumination.
- 296-59-075 Electrical equipment and distribution.
- 296-59-080 Installation, inspection, and maintenance of pipes, piping systems, and hoses.
- 296-59-085 Scaffolds, construction, use, and maintenance.
- 296-59-090 Mobile equipment and lift trucks.
- 296-59-095 Requirements for cranes and hoists—General safety and health standards to prevail.
- 296-59-100 Avalanche control.
- 296-59-102 Acceptable warning signs for typical avalanche control explosive device(s) duds.
- 296-59-103 Storage, makeup, and use of explosives for avalanche control blasting.
- 296-59-105 Handcharge makeup methods.

- 296-59-107 Avalanche control blasting.
- 296-59-109 Retrieving misfires or duds.
- 296-59-115 Ski lift facilities and structures.
- 296-59-120 Ski lift operations.
- 296-59-125 Ski lift aerial work platforms.
- 296-59-130 Ski lift machinery guarding.
- 296-59-135 Appendix 1—Nonmandatory alternative lock-out procedure for ski lifts and tows.

WAC 296-59-001 Foreword. (1) This vertical standard is promulgated in accordance with applicable provisions of the Washington state Administrative Procedure Act, chapter 34.04 RCW, and the Washington Industrial Safety and Health Act, chapter 49.17 RCW.

(2) The requirements of this chapter shall be applied through the department of labor and industries, division of industrial safety and health, in accordance with administrative procedures provided for in chapter 49.17 RCW, and chapters 296-27, 296-350, and 296-360 WAC.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-001, filed 7/6/88.]

WAC 296-59-003 Scope and application. (1) The rules of this chapter are applicable to all persons, firms, corporations, or others engaged in the operation of organized ski areas and facilities within the jurisdiction of the department of labor and industries. These rules shall augment the WAC general horizontal standards, specifically referenced WAC vertical standards, and specifically referenced national standards or manuals.

(2) In the event that specific provisions of this chapter may conflict with any other WAC chapter, national standard, or manual, the provisions of this chapter shall prevail.

(3) The rules of this chapter shall not be applied to rescue crews during the time that rescue procedures are in process provided that reasonably prudent methods, equipment, and processes are employed. Personnel directly engaged in rescue operations shall not be subjected to the immediate restraint provisions of RCW 49.17.130.

(4) Nothing herein contained shall prevent the use of existing ski lift and tow equipment during its lifetime unless specific requirements of this chapter require retrofitting or modifications, provided that it shall be in conformance with applicable national or state code requirements at the time of manufacture and be maintained in good condition to conform with safety factors for the materials and method of manufacture used.

(5) Severability. If any provision of this chapter, or its application to any person, firm, corporation, or circumstance is held invalid under state (RCW) or national (Public Law) laws, the remainder of this chapter, or the application of the provision to other persons or circumstances is not affected.

(6) Variance and procedure. Recognizing that conditions may exist which do not exactly meet the literal requirements of this or other applicable Title 296 WAC standards, pursuant to RCW 49.17.080 and 49.17.090, the director of the department of labor and industries or his/her authorized representative may permit a variance

when other means of providing an equivalent measure of protection are afforded. The specific requirements and procedures for variance application are contained in chapters 296-350 and 296-360 WAC. Application forms may be obtained from the assistant director for safety and health or from regional departmental offices.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-003, filed 7/6/88.]

WAC 296-59-005 Incorporation of other standards.

(1) Lifts and tows shall be designed, installed, operated, and maintained in accordance with American National Standard Institute (ANSI) B77.1-1982, Standards for Passenger Tramways—Aerial Tramways and Lifts, Surface Lifts, and Tows—Safety Requirements.

(2) Future revised editions of ANSI B77.1-1982 may be used for new installations or major modifications of existing installations, as recommended or approved by the equipment manufacturer or a qualified design engineer, except that, where specific provisions exist, variances shall be requested from the department.

(3) Commercial explosives shall be transported, stored, and used in compliance with chapter 296-52 WAC, Safety standards for the possession and handling of explosives, and chapter 70.74 RCW, Washington State Explosives Act, except that avalanche control blasting shall comply with the special provisions of this chapter.

(4) The use of military type weapons for avalanche control shall comply with all requirements of the United States government and/or the military branch having jurisdiction. Compliance shall include qualification of employees, security requirements, and storage and handling of ammunition.

(5) When employees perform activities such as construction work or logging, the WAC chapter governing the specific activity shall apply, e.g., chapter 296-155 or 296-54 WAC, et seq.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-005, filed 7/6/88.]

WAC 296-59-007 Definitions. (1) "Act" means the Washington Industrial Safety and Health Act of 1973, RCW 49.17.010 et seq.

(2) "Aerial work platform" means any form of work platform, work chair, or workbasket designed to lift or carry workmen to an elevated work position.

(3) "ANSI" means the American National Standards Institute.

(4) "Approved" means approved by the director of the department of labor and industries except where this code requires approval by another specific body or jurisdiction authority.

(5) "ASME" means the American Society of Mechanical Engineers.

(6) "Attended," as attending explosives, means the physical presence of an authorized person within the field of vision of explosives. The said attendant shall be awake, alert, and not engaged in activities which may divert their attention so that in case of an emergency the

attendant can get to the explosives quickly and without interference, except for brief periods of necessary absence, during which absence simple theft of explosives is not ordinarily possible.

(7) "Authorized person" means a person approved or assigned by the employer to perform specific duties or to be at specific restricted locations.

(8) "Avalanche" means the sliding or falling of a large amount of snow down a steep slope which has a destructive force due to its mass.

(9) "Avalanche control pack" means a specially designed and constructed pack for carrying explosives.

(10) "Avalanche control route" means a route or specific path which is used by authorized persons in order to control the occurrence of avalanches.

(11) "Avalancher" means a device like a cannon which is used for avalanche control blasting. It has a rotating base calibrated for pointing and the barrel is mounted on an elevating mechanism. It uses a compressed gas to propel a projectile containing an explosive charge and detonating means. The gas source is connected to the gun by high pressure hose with in-line control valves and pressure gauges ahead of the trigger mechanism.

(12) "Belay" means to provide an anchor for a safety line when a person is working in a position exposed to falling or sliding, the mountaineering term.

(13) "Blaster's license" means an individual license issued by the department under the provisions of chapter 296-52 WAC.

(14) "Blasting cap" or "cap" when used in connection with the subject of explosives shall mean detonator.

(15) "Buildings that are not inhabited" means a building(s) which has no one in it while explosives are being made up in an adjacent explosives makeup room or while explosives are being held in an adjacent day box or hand charge storage facility.

(16) "Designated" means appointed or authorized by the highest management authority available at the site.

(17) "Department" means the department of labor and industries, division of industrial safety and health, unless the context clearly indicates otherwise.

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

(19) "Dud" or "misfire" means an explosive charge with a detonating means which does not explode when detonation is attempted.

(20) "Fuse igniter" means a special pyrotechnic device intended to be used to ignite safety fuses.

(21) "Handcharge" means an explosive charge with a cap and fuse assembly inserted in place.

(22) "Hazard" means that condition, potential or inherent, which might cause injury, death, or occupational disease.

(23) "Lift certificate to operate" means an operating certificate issued by the Washington state parks and recreation commission pursuant to chapter 70.88 RCW subsequent to annual inspections as required by chapter 352-44 WAC.

(24) "N.E.C." means the National Electric Code, as published by either the National Fire Protection Association or ANSI.

(25) "Occupied building" means a building regularly occupied in whole or in part as a habitation for human beings, or any church, schoolhouse, railroad station, store, or other building where people are accustomed to assemble.

(26) "Qualified" means one who, by possession of a recognized degree, certificate, license, or professional standing, has successfully demonstrated the personal ability to solve or resolve problems relating to the subject matter, the work, or the project.

(27) "RCW" means the Revised Code of Washington, legislative law.

(28) "ROPS" means rollover protective structure.

(29) "S.A.E." means the society of automotive engineers.

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

(31) "Shall" indicates a mandatory requirement.

(32) "Should" indicates a recommended practice.

(33) "WAC" means the Washington Administrative Code.

(34) "WISHA" means Washington industrial safety and health administration.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-007, filed 7/6/88.]

WAC 296-59-010 Safe place standards. The safe place requirements of the general safety and health standards, WAC 296-24-073, shall be applicable within the scope of chapter 296-59 WAC.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-010, filed 7/6/88.]

WAC 296-59-015 General requirements. (1) The use of any machinery, tool, material, or equipment which is not in compliance with any applicable requirement of this chapter is prohibited. Such machine, tool, material, or equipment shall either be identified as unsafe by tagging or locking the controls to render them inoperable or shall be physically removed from its place of operation.

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

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

(4) Loose or ragged clothing, scarfs, or ties shall not be worn while working around moving machinery.

(5) Workers should not be assigned or permitted to occupy work locations directly under other workers. When such practice is unavoidable, all parties shall be made aware of the potential hazard and adequate protective measures shall be taken. When adequate protective measures are not available, one party shall be moved to eliminate the potential exposure.

[1988 WAC Supp—page 1642]

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

(7) Housekeeping.

(a) All places of employment shall be kept clean to the extent that the nature of the work allows.

(b) The floor of every workroom shall be maintained so far as practicable in a dry condition. Where wet processes are used, drainage shall be maintained. Where necessary or appropriate, waterproof footwear shall be worn.

(c) To facilitate cleaning, every floor, working place, and passageway shall be kept free from protruding nails, splinters, loose boards, unnecessary holes and openings or other tripping hazards.

(d) Cleaning and sweeping shall be done in such a manner as to minimize the contamination of the air with dust and so far as is practical, shall be done outside of working hours.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-015, filed 7/6/88.]

WAC 296-59-020 Management's responsibility. The "management's responsibility" section of the general safety and health standards, WAC 296-24-020, shall be applicable within the scope of chapter 296-59 WAC.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-020, filed 7/6/88.]

WAC 296-59-025 Employee's responsibility. The "employee's responsibility" section of the general safety and health standards, WAC 296-24-025, shall be applicable within the scope of chapter 296-59 WAC.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-025, filed 7/6/88.]

WAC 296-59-027 Work activities which include skiing. Management shall develop a written safety program for all employees whose job duties include skiing. The program shall include but is not limited to the following:

(1) The skiing ability and physical condition of individuals shall be considered when determining individual job assignments;

(2) The ski equipment used shall be appropriate for the individual when performing any given job assignment;

(3) The condition of all ski equipment shall be checked by a qualified individual at the beginning of each ski season;

(4) Employees shall be instructed not to use ski equipment until it has been checked and approved;

(5) Employees shall be instructed to ski within their ability and in control at all times;

(6) Employees shall be required to check all ski equipment, including adjustments, before starting work each day;

(7) Employees shall be instructed not to use ski equipment which is defective or out of adjustment.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-027, filed 7/6/88.]

WAC 296-59-030 Safety bulletin board. The "safety bulletin board" requirements of the general safety and health standards, WAC 296-25-055, shall be applicable within the scope of chapter 296-59 WAC.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-030, filed 7/6/88.]

WAC 296-59-035 First-aid training and certification. The "first-aid training and certification" requirements of the general safety and health standards, WAC 296-24-060, shall be applicable within the scope of chapter 296-59 WAC.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-035, filed 7/6/88.]

WAC 296-59-040 First-aid kits and supplies. The "first-aid kits and supplies" requirements of the general safety and health standards, WAC 296-24-065, shall be applicable within the scope of chapter 296-59 WAC.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-040, filed 7/6/88.]

WAC 296-59-050 Personal protective equipment, general requirements. (1) Application.

(a) Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided, used, and maintained in a sanitary and reliable condition wherever it is indicated by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation, or physical contact.

(b) Employee-owned equipment. Where employees provide their own protective equipment, the employer shall be responsible to assure its adequacy, including proper maintenance, and sanitation of such equipment.

(c) Design, construction, testing, and use of personal protective equipment shall comply with the requirements of the General safety and health standards, chapter 296-24 WAC; the Occupational health standards—Safety standards for carcinogens, chapter 296-62 WAC; or the currently applicable ANSI standard.

(2) Eye and face protection. Eye and face protective equipment shall be provided and worn where there is exposure in the work process or environment to hazard of injury, which can be prevented by such equipment.

(3) Occupational head protection. Employees working in areas where there is a possible danger of head injury from impact, or from falling or flying objects, or from electrical shock and burns, shall be protected by protective helmets, i.e., a lift operator would not be required to use a hardhat while operating the lift. However, if that

same person is assisting with maintenance operations and is working under a tower where overhead work is being done, that operator would now be required to wear an approved helmet.

(a) Helmets for the protection of employees against impact and/or penetration of falling and flying objects shall meet the specifications contained in American National Standards Institute, Z89.1-1986, Safety Requirements for Industrial Head Protection.

(b) Helmets for the head protection of employees exposed to high voltage electrical shock and burns shall meet the specifications contained in American National Standards Institute, Z89.2-1971, Safety Requirements for Industrial Protective Helmets for Electrical Workers, Class B.

(c) Approved head protection shall be worn by operators of snowmobiles and other mobile oversnow equipment which is not equipped with a rigid metal operator's cab.

(4) Occupational foot protection.

(a) Substantial footwear appropriate for the work conditions encountered shall be worn by all employees.

(b) Where the job assignment includes exposure to slipping hazards, soles and heels of footwear shall be of such material and design as to reduce the hazard of slipping.

(5) Safety belts, lifelines, lanyards, and nets.

(a) Safety belts, lifelines, and lanyards which meet the requirements of ANSI A10.14 shall be provided and used whenever employees are working in locations which expose them to a fall of more than ten feet. The particular work location and application shall dictate which type of belt or harness and length of lanyard is used.

(b) Lifelines shall be secured to an anchorage or structural member capable of supporting a minimum dead weight of five thousand four hundred pounds.

(c) Lifelines used on rock scaling applications or in areas where the lifeline may be subjected to cutting or abrasion shall be a minimum of seven-eighths inch wire core manila rope or equivalent. For all other lifeline applications, three-fourths inch manila rope or equivalent with a minimum break strength of five thousand four hundred pounds may be used.

(d) Each safety belt lanyard shall be a minimum of one-half inch nylon, or equivalent, with a minimum of five thousand four hundred pounds breaking strength.

(e) Employees will not be required to wear a safety belt and lanyard while riding on a standard lift chair while seated in the normal riding position.

(f) Safety nets meeting the requirements of ANSI A10.11 shall be used when other acceptable forms of fall protection are not useable. When used, safety nets shall extend a minimum of eight feet beyond the edge offering exposure, shall be hung with sufficient clearance to prevent user's contact with surfaces or objects below, and shall not be more than twenty-five feet below the fall exposure edge.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-050, filed 7/6/88.]

WAC 296-59-055 Lockout requirements. (1) Each employer shall develop a formal written policy and procedure for lockout requirements. The policy shall embody the principles of subsection (2) of this section and shall clearly state that the procedures must be applied in all instances.

(a) The lockout policy shall be posted on all required employee bulletin boards.

(b) The lockout policy and procedures shall be made a part of new employee orientation and employee training programs.

(c) Supervisors and crew leadpersons shall assure compliance with the published policy and procedures in all instances.

(2) Whenever the unexpected start-up of machinery, the energizing of electrical circuits, the flow of material in piping systems, or the removal of guards would endanger workers, such exposure shall be prevented by deactivating and locking out the controls as required by this section.

(3) Equipment requirements.

(a) The employer shall provide and each employee shall use as many padlocks, tags, chains, or devices as are necessary to implement these requirements.

(b) Provisions shall be made whereby the source of power or exposure can be locked out in accordance with the requirements of this section.

(c) On electrically powered equipment, "stop/start" control switches shall not be used as lockout switches. Lockout switches must be the primary circuit disconnects and must adequately separate both the power source and any auxiliary power unit from the prime mover so that accidental start-up of the equipment being locked out is precluded.

(d) Keyed-alike locks, which all open with identical keys, shall not be issued as personal lockout locks.

(4) Training requirements.

(a) Each person who will be given authority to implement these requirements shall first be thoroughly trained in the requirements and procedures.

(b) Before being given authority to deactivate and lockout a particular system or piece of equipment, authorized personnel shall be made fully aware of all power sources and/or material entry sources which may offer exposure.

(c) Checklists shall be used to implement effective lockout procedures for complex systems or equipment.

(i) Complex is identified as those systems or equipment which require the locking out of four or more controls to assure isolation or which have controls remote from the immediate work area.

(ii) Checklists shall identify all controls necessary to achieve isolation at the intended worksite(s).

(iii) Checklists shall provide a space after each listed control to be used for the identity of the person(s) who performed the lockout and required post-lockout tests of each control.

(iv) Checklists shall be prepared by qualified personnel and approved by the responsible area supervisor before each use.

(5) Control procedure.

(a) Each person who could be exposed to the hazard shall apply a personal padlock on each control mechanism. Padlocks shall be applied in such a manner as to physically block the controls from being moved into the operating position. Each lock shall be personally identified or an information tag identifying the owner shall be attached to the lock.

(b) Padlocks used in lockout procedures may only be removed by the person identified on the lock, except, when it is positively determined that the owner/user of the lock has left the premises without removing a lock, the job supervisor may remove the lock in accordance with a specific procedure formulated by the local plant labor management safety committee or approved by the department.

(6) Testing after lockout or tagout. After tagging or locking out equipment, a test shall be conducted to ascertain that the equipment has been made inoperative or the flow of material has been positively stopped. Precautions shall be taken to ascertain that persons will not be subjected to any hazard while conducting the test if the power source or flow of material is not shut off.

(7) Temporary or alternate power to be avoided. Whenever possible, temporary or alternate sources of power to the equipment being worked on shall be avoided. If the use of such power is necessary, all affected employees shall be informed and the source of temporary or alternate power shall be identified.

(8) Where tags or signs are required to implement the lockout and control procedures, the tag and attachment device shall be constructed of such material that it will not be likely to deteriorate in the environment that it will be subjected to.

(9) Provisional exception. Electrical lighting and instrument circuits of two hundred forty volts or less on single phase systems or two hundred seventy-seven volts on three-phase systems may be exempted from the lockout requirements of subsection (5)(a) of this section provided that:

(a) An information tag meeting the requirements of subsection (8) of this section is used in lieu of a padlock.

(b) The information tag shall be placed on the switch or switch cover handle in such a manner as to easily identify the deactivated switchgear.

(10) Deactivating piping systems.

(a) Hazardous material systems are defined as: Gaseous systems that are operated at more than two hundred psig; systems containing any liquid at more than five hundred psig; systems containing any material at more than 130°F; systems containing material which is chemically hazardous as defined by NFPA 704 M Class 3 and 4; systems containing material classified as flammable or explosive as defined in NFPA Class I.

(b) Lockout of piping systems shall provide isolation to the worksite, including backflow where such potential exists and where the system is classified as a hazardous material system. The required method shall be applied based on the content of the system as specified below:

(i) Nonhazardous systems shall be deactivated by locking out either the pump or a single valve.

(ii) Hazardous material systems shall be deactivated by one of the following methods:

(A) Locking out both the pump and one valve between the pump and the worksite;

(B) Locking out two valves between the hazard source and the worksite;

(C) Installing and locking out a blank flange between the hazard source and worksite.

Exception: Aerial tramways and lifts, surface lifts and tows. It is recognized that some inspection, testing, running adjustments, and maintenance tasks cannot be accomplished on this equipment while using standard lockout procedures, particularly when using a work platform suspended from the haulrope. Management of each ski area shall therefore develop a specific written procedure to be used in any instance where any potentially exposed personnel cannot personally lock the controls. The procedure for each area shall meet the following minimum requirements:

(I) The controls shall be attended by a qualified operator at all times when personnel are in potentially exposed work positions and the controls are not padlocked out.

(II) Direct communication capability between the control operator and remote work crew shall be maintained at all times.

(III) All personnel involved shall be thoroughly trained in the exact procedures to be followed.

(IV) Extension tools which minimize personnel exposure shall be used where possible.

(V) The equipment shall be operated at the slowest speed possible consistent with the task at hand.

(VI) This exception shall not be used by more than one workcrew at more than one remote location on any single piece of equipment or system.

(VII) This exception is limited to work on the haulrope, towers, and replacing bullwheel liners. For all other work on the bullwheels or drive operations, the master disconnect shall be deactivated and locked out.

Note: See Appendix 1 for illustrative example.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-055, filed 7/6/88.]

WAC 296-59-060 Vessel or confined area requirements. The requirements of WAC 296-62-145, general occupational health standards, shall be applicable within the scope of chapter 296-59 WAC.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-060, filed 7/6/88.]

WAC 296-59-065 Fire protection and ignition sources. The requirements of WAC 296-24-585, et seq., relating to fire protection requirements, shall be applicable within the scope of chapter 296-59 WAC.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-065, filed 7/6/88.]

WAC 296-59-070 Illumination. (1) Sufficient illumination required. All areas shall be sufficiently illuminated in order that persons in the area can safely perform their assigned duties. The recommended levels of illumination specified in chapter 296-62 WAC, general occupational health standards, shall be followed.

When areas are not specifically referred to in chapter 296-62 WAC and the adequacy of illumination for the area or task performed is questionable, a determination of the amount of illumination needed may be made by the division of industrial safety and health.

(2) Emergency or secondary lighting system required.

(a) There shall be an emergency or secondary lighting system which can be actuated immediately upon failure of the normal power supply system. The emergency or secondary lighting system shall provide illumination in the following areas:

(i) Wherever it is necessary for workers to remain at their machine or station to shut down equipment in case of power failure;

(ii) At stairways and passageways or aiseways used by workers as an emergency exit in case of power failure;

(iii) In all plant first-aid and/or medical facilities;

(iv) In emergency power and control room, i.e., in emergency generator rooms unless arranged to start automatically in the event of power failure, or on ski lift motor drive rooms where it would be necessary for employees to switch on the emergency drive system during night skiing.

(b) Emergency lighting facilities shall be checked at least every thirty days for mechanical defects. Defective equipment shall be given priority for repair schedule.

(3) Extension cord type lights. All extension cord type lights shall be provided with proper guards.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-070, filed 7/6/88.]

WAC 296-59-075 Electrical equipment and distribution. (1) National Electrical Code to prevail. All electrical installations and electrical utilization equipment shall comply with the National Electrical Code requirements.

Exception: In instances where (N.E.C.) conflicts with ANSI B77.1 with respect to tramways, surface lifts, or tows, ANSI B77.1 shall prevail.

(2) Authorized personnel to do electrical work. Only those persons who are qualified to do the work assigned and are authorized by the employer shall be allowed to perform electrical work on any electrical equipment or wiring installations.

(3) High voltage areas to be guarded. Motor rooms, switch panel rooms, or other areas where persons may come in contact with high voltages shall be fenced off or be enclosed in a separate area. The gate, door, or access to such area shall be posted with a notice stating that only authorized persons are allowed in the area.

(4) Control panels. In areas where mobile equipment operates, floor stand panels shall be protected from being struck by moving equipment. Start or run handles and buttons shall be protected from accidental actuation.

(5) Switches or control devices. Switches, circuit breakers, or other control devices shall be so located that they are readily accessible for activation or deactivation and shall be marked to indicate their function or machine which they control. The positions of ON and OFF

shall be marked or indicated and provision shall be made for locking out the circuit.

(6) Starting requirements for electrically driven equipment after power failure. Electrically driven equipment shall be so designed that it will not automatically start upon restoration of power after a power failure if it will create a hazard to personnel.

(7) Posting equipment automatically activated or remotely controlled. Equipment which is automatically activated or remotely controlled shall be posted, warning persons that machine may start automatically if it will create a hazard to personnel.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-075, filed 7/6/88.]

WAC 296-59-080 Installation, inspection, and maintenance of pipes, piping systems, and hoses. (1) Definitions applicable to this section.

(a) "Hazardous material system" is any system within the following classifications:

(i) "Flammable or explosive" – any system containing materials which are hazardous because they are easily ignited and create a fire or explosion hazard, defined by NFPA as Class I liquids;

(ii) "Chemically active or toxic" – any system containing material which offers corrosion or toxic hazard in itself or can be productive of harmful gases upon release, defined by NFPA 704M as Class 3 and 4 materials;

(iii) "Thermally hazardous" – any system above 130°F which exposes persons to potential thermal burns;

(iv) "Pressurized" – any gaseous system above two hundred psig or liquid system above five hundred psig.

(b) "Piping system" – any fixed piping, either rigid pipe or flexible hose, including all fittings and valves, in either permanent or temporary application.

(2) Design and installation. All new piping systems intended to be used in hazardous material service shall be designed and installed in accordance with applicable provisions of the ASME Code for Pressure Piping or in accordance with applicable provisions of ANSI B31.1 through B31.8. The referenced edition in effect at the time of installation shall be utilized.

Note: Both referenced standard have identical requirements.

(3) Inspection and maintenance.

(a) Management shall develop a formal program of inspections for all hazardous material piping systems. The program shall be based on sound maintenance engineering principles and shall demonstrate due consideration for the manufacturing specifications of the pipe, hose, valves, and fittings, the ambient environment of the installation and the corrosive or abrasive effect of the material handled within the system.

(b) Type and frequency of tests and/or inspections and selection of inspection sites shall be adequate to give indications that minimum safe design operating tolerances are maintained. The tests may include visual and nondestructive methods.

(c) All employers shall submit their formal program of initial and ongoing inspections to the department for

approval within one year after the effective date of this requirement.

(d) All existing hazardous material systems shall be inspected to the criteria of this section prior to two years after effective date, or in accordance with a schedule approved by the department.

(4) Inspection records.

(a) Results of inspections and/or tests shall be maintained as a record for each system.

(b) Past records may be discarded provided the current inspection report and the immediate preceding two reports are maintained.

(c) When a system is replaced, a new record shall be established and all past records may be discarded.

(d) The records for each system shall be made available for review by the department upon request.

(e) The employer may omit the inspection requirements for portions of existing systems that are buried or enclosed in permanent structures in such a manner as to prevent exposure to employees even in the event of a failure.

(5) Systems or sections of systems found to be below the minimum design criteria requirements for the current service shall be repaired or replaced with component parts and methods which equal the requirements for new installations.

(6) Identification of piping systems.

(a) Pipes containing hazardous materials shall be identified. It is recommended that USAS A13.1 "Scheme for Identification of Piping Systems" be followed.

(b) Positive identification of piping system content shall be identified by lettered legend giving the name of the content in full or abbreviated form, or a commonly used identification system. Such identification shall be made and maintained at suitable intervals and at valves, fittings, and on both sides of walls or floors. Arrows may be used to indicate the direction of flow. Where it is desirable or necessary to give supplementary information such as hazard of use of the piping system content, this may be done by additional legend or by color applied to the entire piping system or as colored bands. Legends may be placed on colored bands.

Examples of legends which may give both positive identification and supplementary information regarding hazards or use are:

Ammonia	Hazardous liquid or gas
Chlorine	Hazardous liquid or gas
Liquid caustic . . .	Hazardous liquid
Sulphuric acid . .	Hazardous liquid
Natural gas	Flammable/explosive gas

Note: Manual L-1, published by Chemical Manufacturers Association, Inc., is a valuable guide in respect to supplementary legend.

(c) When color, applied to the entire piping system or as colored bands, is used to give supplementary information it should conform to the following:

CLASSIFICATION	PREDOMINANT COLOR
F-Fire-protection equipment	Red
D-Dangerous materials	Yellow (or orange)
S-Safe materials	Green (or the achromatic colors, white, black, gray, or aluminum)
And, when required, P-Protective materials	Bright blue

(d) Legend boards showing the color and identification scheme in use shall be prominently displayed at each plant. They shall be located so that employees who may be exposed to hazardous material piping systems will have a frequent reminder of the identification program.

(e) All employees who work in the area of hazardous material piping systems shall be given training in the color and identification scheme in use.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-080, filed 7/6/88.]

WAC 296-59-085 Scaffolds, construction, use, and maintenance. (1) Whenever work must be performed at a height which cannot be reached from the floor or permanent platform and where it would not be a safe practice to use a ladder, a properly constructed scaffold shall be provided and used.

(2) Scaffolds shall be constructed and used in compliance with WAC 296-24-825 through 296-24-84013.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-085, filed 7/6/88.]

WAC 296-59-090 Mobile equipment and lift trucks.

(1) Mobile equipment shall be designed, constructed, maintained, and used in accordance with this section and appropriate ANSI and/or SAE requirements.

(2) Operator training.

(a) Methods shall be devised by management to train personnel in the safe operation of mobile equipment.

(b) Training programs for all mobile equipment shall include the manufacturer's operating instructions when such instructions are available.

(c) Only trained and authorized operators shall be permitted to operate such vehicles.

(3) Special duties of operator. Special duties of the operator of a power-driven vehicle shall include the following:

(a) Test brakes, steering gear, lights, horns, warning devices, clutches, etc., before operating vehicle;

(b) Not move a vehicle while an unauthorized rider is on the vehicle;

(c) Slow down and sound horn upon approaching blind corners or other places where vision or clearance is limited;

(d) Comply with all speed and traffic regulations and other applicable rules;

(e) Have the vehicle being operated under control at all times so that he can safely stop the vehicle in case of emergency; and

(f) Keep the load on the uphill side when driving a forklift vehicle on a grade.

(4) Operator to be in proper position. Control levers of lift trucks, front end loaders, or similar types of equipment shall not be operated except when the operator is in his proper operating position.

(5) Raised equipment to be blocked. Employees shall not work below the raised bed of a dump truck, raised buckets of front end loaders, raised blades of tractors or in similar positions without blocking the equipment in a manner that will prevent it from falling. When working under equipment suspended by use of jacks, safety stands or blocking shall be used in conjunction with the jack.

(6) Precautions to be taken while inflating tire. Unmounted split rim wheels shall be placed in a safety cage or other device shall be used which will prevent a split rim from striking the worker if it should dislodge while the tire is being inflated.

(7) Reporting suspected defects. If, in the opinion of the operator, a power-driven vehicle is unsafe, the operator shall report the suspected defect immediately to the person in charge. Any defect which would make the vehicle unsafe to operate under existing conditions shall be cause for immediate removal from service. The vehicle shall not be put back into use until it has been made safe.

(8) Safe speed. Vehicles shall not be driven faster than a safe speed compatible with existing conditions.

(9) Unobstructed view.

(a) Vehicle operators shall have a reasonably unobstructed view of the direction of travel. Where this is not possible, the operator shall be directed by a person or by a safe guidance means or device.

(b) Where practical, mirrors shall be installed at blind corners or intersections which will allow operators to observe oncoming traffic.

(c) It is recommended that vehicles operating in congested areas be provided with an automatic audible or visual alarm system.

(10) Passengers to ride properly.

(a) Passengers shall not be permitted to ride with legs or arms extending outside the running lines of the cab, FOPS, or ROPS of any vehicle.

(b) Passengers on mobile oversnow equipment shall ride within the cab unless exterior seating is provided. The exterior seating may include the cargo bed provided that the bed is equipped with sideboards and a tailgate at least ten inches high. If passengers are permitted to stand in the bed, adequate handholds shall be provided.

(c) The number of passengers and seating arrangements within the cab on any mobile equipment shall not interfere with the operator's ability to safely operate the equipment.

(d) Exterior passengers shall not be permitted on mobile oversnow equipment which has snow grooming equipment mounted on the bed or when the machine is towing any kind of equipment, sleds, etc.

(e) Operators shall use good judgment with respect to speed and terrain when carrying exterior passengers.

(11) Horns and lights.

(a) Every vehicle shall be provided with an operable horn distinguishable above the surrounding noise level.

(b) Any vehicle required to travel away from an illuminated area shall be equipped with a light or lights which adequately illuminate the direction of travel.

(12) Brakes on power-driven vehicles. Vehicles shall be equipped with brakes and devices which will hold a parked vehicle with load on any grade on which it may be used. The brakes and parking devices shall be kept in proper operating condition at all times.

(13) Cleaning vehicles. All vehicles shall be kept free of excessive accumulations of dust and grease which may present a hazard.

(14) Lifting capacity of vehicle to be observed. At no time shall a load in excess of the manufacturer's maximum lifting capacity rating be lifted or carried. Such lifting capacity may only be altered with the approval of the equipment manufacturer or a qualified design engineer.

(15) Posting rated capacity. The maximum rated lifting capacity of all lift trucks shall at all times be posted on the vehicle in such a manner that it is readily visible to the operator.

(16) Carrying loose material. Lift trucks shall not be used to carry loose loads of pipe, steel, iron, lumber, palletized material, rolls of paper, or barrels unless adequate clearance is provided and the loads are stabilized.

(17) Position of lift forks or clamps. The forks or clamps of lift trucks shall be kept as low as possible while the vehicle is moving. They shall be lowered to the ground or floor when the vehicle is parked.

(18) Walking under loads prohibited. No person shall be allowed under the raised load of a lift truck, backhoe, or front end loader.

(19) Hoisting of personnel on vehicle forks prohibited. Personnel shall not be hoisted by standing directly on the forks of vehicles.

(20) Using forklifts as elevated work platforms. A platform or structure built specifically for hoisting persons may be used providing the following requirements are met:

(a) The structure must be securely attached to the forks and shall have standard guardrails and toeboards installed on all sides;

(b) The hydraulic system shall be so designed that the lift mechanism will not drop faster than one hundred thirty-five feet per minute in the event of a failure in any part of the system. Forklifts used for elevating work platforms shall be identified that they are so designed;

(c) A safety strap shall be installed or the control lever shall be locked to prevent the boom from tilting;

(d) An operator shall attend the lift equipment while workers are on the platform;

(e) The operator shall be in the normal operating position while raising or lowering the platform. A qualified operator shall remain in attendance whenever an employee is on the work platform;

(f) The vehicle shall not travel from point to point while workers are on the platform except that inching or maneuvering at very slow speed is permissible; and

(g) The area between workers on the platform and the mast shall be adequately guarded to prevent contact with chains or other shear points.

(21) Overhead guards on lift trucks. All lift trucks shall be equipped with an overhead guard constructed and installed to conform to USAS B56.1-1969 "Safety Code for Powered Industrial Trucks." This guard may be removed only when it cannot be used due to the nature of the work being performed in which case loads shall be maintained so as not to create a hazard to the operator.

(22) Protection from exhaust system. Any exhaust system which might be exposed to contact shall be properly insulated or isolated to protect personnel. Exhaust systems on lift trucks and jitneys shall be constructed to discharge either within twenty inches from the floor or eighty-four inches or more above the floor. The exhausted gases shall be directed away from the operator. The equipment shall be designed in such a manner that the operator will not be exposed to the fumes.

(23) Emergency exit from mobile equipment. Mobile equipment with an enclosed cab shall be provided with an escape hatch or other method of exit in case the regular exit cannot be used.

(24) Vehicle wheels chocked. When driving mobile equipment onto the bed of a vehicle, the wheels of the vehicle shall be chocked.

(25) Prevent trailer from tipping. Suitable methods shall be used or devices installed which will prevent the trailer from tipping while being loaded or unloaded.

(26) Refueling. Gasoline or LPG engines shall be shut off during refueling.

(27) Close valve on LPG container. Whenever vehicles using LP gas as a fuel are parked overnight or stored for extended periods of time indoors, with the fuel container in place, the service valve of the fuel container shall be closed.

(28) LPG tanks. LPG vehicle fuel tanks shall be installed and protected in a manner which will minimize the possibility of damage to the tank.

(29) Inspecting and testing of LPG containers. LPG containers shall be inspected and tested as required by chapter 296-24 WAC.

(30) Spinners on steering wheels. The use of spinners on steering wheels shall be prohibited unless an antikick device is installed or the equipment has a hydraulic steering system.

(31) The hearing conservation requirements of the general occupational health standards, WAC 296-62-09015, shall be applicable for mobile equipment operation.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-090, filed 7/6/88.]

WAC 296-59-095 Requirements for cranes and hoists—General safety and health standards to prevail. All applicable rules for design, construction, maintenance, operation, and testing of cranes and hoists contained in the General safety and health standards, chapter 296-24 WAC, shall be met.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-095, filed 7/6/88.]

WAC 296-59-100 Avalanche control. (1) General.

(a) During periods of high avalanche danger, slopes and trails in avalanche paths shall not be opened for use until trained personnel have evaluated conditions and determined whether avalanche control work is necessary.

(b) When avalanche control work is deemed necessary, slopes and trails in the potential avalanche path shall not be opened until the work is completed.

(c) An avalanche shall not be purposely released until the avalanche path and potential runout zone are clear of personnel.

(d) Avalanche guards, signs, and/or barricades shall be positioned at normal entrances to the avalanche path if there is any chance that personnel will enter the danger zone during intentional release activities.

(e) During very unstable snow conditions, release of one avalanche may trigger sympathetic releases over a wide area. Avalanche workers shall consider such possibility and clear the appropriate areas of personnel.

(2) Personnel and equipment.

(a) The avalanche control crew shall be adequately trained and physically capable for tasks which can be anticipated in their individual job assignments.

(b) No person shall accept or be given a job assignment which is beyond the individual's physical ability or training.

(c) On-slope assignments which include potential exposure to avalanche hazards shall only be conducted by fully qualified and fully equipped control crew members.

(d) The control crew may be split up into smaller groups (teams) to work on multiple areas simultaneously provided that each team consists of at least two qualified members.

(e) Each avalanche control crew or team shall have one or more designated rescue coordinators as is deemed necessary to maintain communications. Compliance with this requirement may be achieved by designating control crew teams to serve as each others' rescue coordinator provided that the teams are reasonably proximate to each other and do in fact maintain frequent communications.

(f) Each avalanche control crew member shall be equipped for continuous two-way communications to the avalanche crew coordinators.

(g) The avalanche crew or teams shall not be assigned to on-slope areas where they cannot maintain communications with their designated coordinator. This requirement may be met by the use of a relay person, however, if any team completely loses communications they shall return directly to base via the safest route available.

(h) Each person on an avalanche control team shall be equipped with a shovel and an electronic transceiver before commencing on-slope control work. The transceiver

shall be in the transmit position whenever personnel are performing on-slope job assignments.

(3) Avalanche rescue plan. Each ski area shall have a written avalanche rescue plan. The plan shall require:

(a) All rescue personnel who will be assigned to on-slope activities shall:

- (i) Be competent skiers;
- (ii) Have a current first-aid card;
- (iii) Be thoroughly trained in the rescue plan details;

(b) A specific list of required equipment for rescue crew personnel including:

- (i) Probes;
- (ii) Belaying rope;
- (iii) Shovels;
- (iv) Two-way communication radios;
- (v) Electronic transceivers;
- (c) A list of rescue equipment locations;
- (d) Specific rescue procedures to be followed.

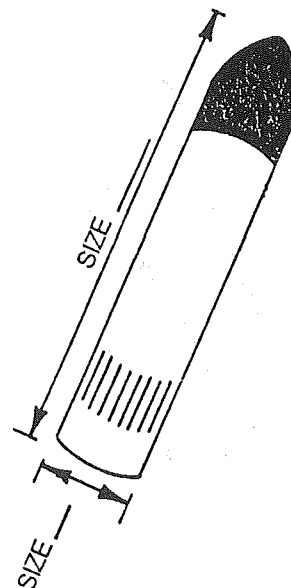
[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-100, filed 7/6/88.]

WAC 296-59-102 Acceptable warning signs for typical avalanche control explosive device(s) duds.

DANGER

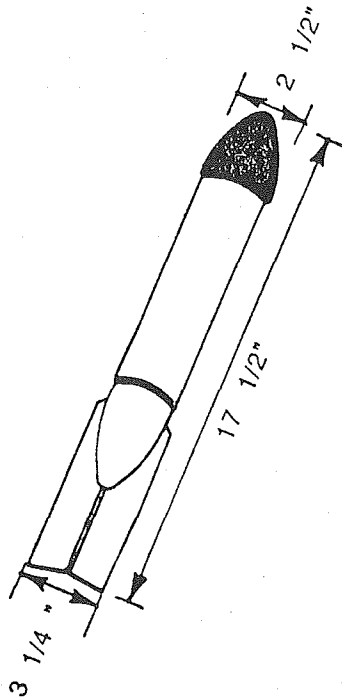
EXPLOSIVES ON THE MOUNTAIN

Unexploded warheads, projectiles, or handcharges used in avalanche control may be found in target areas or in avalanche runout zones.

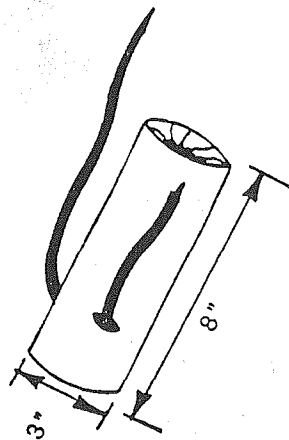


**UNEXPLODED WARHEADS
WARHEAD MAY BE DISTORTED
FROM IMPACT.**

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-102, filed 7/6/88.]



AVALANCHER PROJECTILE
RED OPAQUE BODY,
RED TRANSLUCENT FINIS.



DYNAMITE HANDCHARGE
Brown color wrapping,
will usually have fuse.

WAC 296-59-103 Storage, makeup, and use of explosives for avalanche control blasting. (1) General.

(a) The storage, handling, and use of explosives and blasting agents used in avalanche control practices shall comply with this chapter unless stored, handled, and used in compliance with chapter 70.74 RCW and chapter 296-52 WAC.

(b) The minimum requirements published in WAC 296-59-103 through 296-59-111 (inclusive) shall only be applicable to the storage, handling, and use of explosives and blasting agents in the endeavor of avalanche control. The use of explosives for conventional purposes such as but not limited to demolition, site clearing, or construction shall be regulated by chapter 70.74 RCW and chapter 296-52 WAC.

(2) Management responsibility.

(a) Explosives and blasting agents shall not be stored, kept, or had in any regularly occupied areas or buildings except in compliance with either chapter 296-52 WAC or this chapter.

(b) Explosives and blasting agents shall not be assembled or combined to form armed charges in any regularly occupied area or building except in compliance with this chapter.

(3) Personnel.

(a) Only fully qualified and licensed blasters shall be permitted to assemble or arm explosives components.

(b) Training shall include avalanche blasting experience so that the problems encountered in cold weather blasting are known factors.

(c) All training activities shall be conducted under the attended supervision of a fully qualified and licensed blaster.

(4) General requirements.

(a) Detonating systems for hand-placed or hand-thrown charges.

(i) The ignition system on single-unit handcharges shall consist of a nonelectrical cap, safety fuse, and a fuse igniter.

(ii) Multiple units combined to form a single handcharge may use the above system or an approved detonating cord system. No other ignition system shall be permissible without specific approval by the department.

(b) Multiple charge blasts.

(i) Detonating cord shall be used in lieu of blasting wire to connect multiple charge blasts.

(ii) After all charges are placed, connected to the detonating cord, and the charges are ready to be ignited, a safety fuse and cap shall be attached to the detonating cord. A fuse igniter may then be attached to ignite the safety fuse.

(c) Blasting caps shall be no larger than No. 8 except when recommended by the explosives manufacturer for a particular explosive used within a specific application.

(d) Electric blasting caps are not permitted.

(e) Only the highest quality safety fuse with excellent water resistance and flexibility shall be used.

If you find an unexploded (dud) charge, do the following:

1. Do not disturb or touch!
2. Mark the location within 5 to 10 feet.
3. Immediately report the location to the nearest lift operator, ski patrolman or U.S. Forest Service employee.

(f) Fuse length.

(i) Safety fuse length shall be selected to permit the control team adequate escapement time from the blast area under all reasonable contingencies (falls, release of bindings, etc.)

(ii) In no instance shall a fuse length with less than seventy seconds burn time be permitted.

(iii) The burn time of each roll of safety fuse shall be checked prior to use.

(iv) Checked rolls shall be marked with the tested burn time.

(v) It is recommended that all handcharges be prepared for ignition with one safety fuse and igniter.

Note: Standard safety fuse burns at a rate of 0.5 meters (\pm 10%) per seventy seconds at two thousand five hundred meters elevation. This rate equates to approximately nineteen and three-quarter inches fuse length for seventy second handcharge fuses at normal ski area elevations.

(5) Explosives.

(a) Explosives chosen shall have a safe shelf life of at least one operating season in the storage facilities in which it will be stored.

(b) Explosives chosen shall have excellent water and freezing resistance.

(c) Industrial primers (or boosters) that consist mainly of TNT or gelatin are the recommended explosives.

(6) Transporting explosives and handcharges.

(a) Handcharges or explosives components shall be transported in approved type avalanche control packs, in United States Department of Transportation approved shipping containers or in licensed magazines.

(b) Criteria for avalanche control packs.

(i) The pack shall be constructed of water resistant material.

(ii) Packs shall be constructed with sufficient individual compartments to separate handcharges or explosives components from tools or other equipment or supplies which may be carried in the pack.

(iii) Each compartment used for handcharges or explosives components shall have an independent closure means.

(iv) If fuse igniters will be permitted to be carried on the avalanche control pack, a separate compartment with individual closure means shall be attached to the outside of the exterior of the pack.

(c) Use of avalanche control packs.

(i) Packs shall be inspected daily, prior to loading, for holes or faulty compartment closures. Defective packs shall not be used until adequately repaired.

(ii) Tools or other materials shall not be placed in any compartment which contains handcharges or explosives components.

(iii) Fuse igniters shall never be placed anywhere inside the pack when the pack contains handcharges or other explosives components.

(iv) Fuse igniters may be carried in a separate compartment attached to the outside of the pack exterior but preferably in a compartment attached to the front of the carrying harness. Another acceptable alternative is to

carry the igniters in a jacket pocket completely separate from the pack.

(v) Handcharges or explosives components shall not be stored or left unattended in avalanche control packs. Unused handcharges shall be promptly disassembled at the end of individual control routes and all components returned to approved storage.

(vi) Individual control team members shall not carry more than thirty-five pounds of handcharges in avalanche control packs.

(vii) A handcharge or cap and fuse assembly which has a fuse igniter attached shall never be placed in an avalanche control pack for any reason.

(d) Whenever explosives or explosives components are transported in or on any vehicle powered by an internal combustion engine, provisions shall be made to ensure that said explosives or containers cannot come into contact with the hot exhaust system.

(e) Handcharges or explosives components shall not be transported in spark-producing metal containers.

(f) Handcharges shall not be transported on public roads and highways when such roads or highways are open to the public. Explosives components shall only be transported on public roads or highways in compliance with United States Department of Transportation regulations.

[Statutory Authority: Chapter 49.17 RCW, 88-14-108 (Order 88-11), § 296-59-103, filed 7/6/88.]

WAC 296-59-105 Handcharge makeup methods.

General. The department shall recognize two permissible methods concerning handcharges for avalanche control blasting. The descriptions and requirements for each method are contained in this section. Every ski area operation which conducts avalanche control blasting should use Method II "Hand charge makeup room." A well designed and constructed handcharge makeup room can enhance the correct assembly of components which will maintain the best possible control over explosives and components, reduce the probability of an explosives incident, and reduce the incidence of misfires from incorrect makeup or moisture.

(1) Method I. Makeup at the blast site.

(a) The ignition system shall consist of a nonelectrical blasting cap and highest quality water resistant safety fuse, or detonating cord, assembled as recommended by the manufacturer.

(b) Detonating cord (i.e., primacord) shall be used to connect separated multiple-charge blasts.

(c) No other ignition system shall be permissible on hand-placed or hand-thrown avalanche control charges unless variance is granted by the department.

(d) Caps shall be installed on correct length fuses prior to being transported out onto control routes.

(e) Caps shall only be crimped with a crimper tool approved for that purpose.

(f) Assembling caps and fuses shall be done in a warm, dry, well-lighted environment. The location used for assembly shall not have flammable fuels, flammable gases, or explosives present where accidental detonation

of the caps could create a secondary ignition or detonation hazard.

(g) Each cap shall be protected by a styrofoam shield or the equivalent before being placed in an avalanche control pack for transportation.

(h) A fuse igniter shall never be attached to a fuse until the fuse and cap assembly is installed in the handcharge at the blast site and the control crew is fully prepared to ignite the charge.

(i) All class A explosives shall be attended as defined in WAC 296-59-007 at all times when the explosive is out of the class 1 storage magazine.

(j) Disbursement of explosive charges from the class 1 storage magazine into avalanche control packs shall be done outside the storage magazine. Records shall be maintained for all explosives disbursed.

(k) Caps, cap and fuse assemblies, armed handcharges, or fuse igniters shall not be carried into or stored in a class 1 magazine which contains class A explosives.

(2) Method II. Handcharge makeup room. This method is different from method I primarily in that the fuse and cap assembly is installed in the explosive charge while inside a special makeup room. The assembly procedure shall be as follows:

(a) Install caps on correct length fuses with an approved crimper tool before explosives are brought into the makeup room.

(b) The cap and fuse assemblies shall not be combined with explosives to form handcharges until just before the intended time of distribution.

(c) Only nonsparking skewers shall be used to punch holes in an explosives cartridge.

(d) The fuse shall be laced or taped in position after inserting the cap in the charge.

(e) Each handcharge shall be placed in an explosives box or avalanche control pack immediately after assembly is completed.

(f) No spark-producing metal tools shall be used to open explosives containers.

(g) Fuse igniters shall never be attached to a fuse or a handcharge until the handcharge is at the blast site and the control crew is fully prepared to ignite the charge.

(3) Makeup room requirements, procedures.

(a) Construction requirements.

(i) Makeup rooms located in accordance with the American Standard Quantity and Distance Tables for storage shall not require construction of reinforced concrete walls, floors, and doors. All other requirements of this chapter shall be applicable for such facilities.

(ii) Floors and walls. The floor and walls shall be constructed of reinforced concrete not less than eight inches thick. The rebar shall be not less than one-half inch diameter and shall be spaced on twelve-inch vertical and horizontal centers. The rebar shall be bent at a ninety degree angle and extend a minimum of twenty-four inches into the adjoining floor or wall to secure each floor and wall joint.

(iii) Roof. The roof is not limited to specific materials but shall provide both weather protection and standard snow loading protection for the region.

(iv) Access door(s).

(A) If a hinged door mounting is utilized, the hinge shall be mounted on the inside so that the door opens into the makeup room. In the fully closed position, in position to be locked, the door shall be a minimum of two inches larger than the access opening on all sides.

(B) If a flush door mounting is utilized, the door shall be mounted with a two-inch decreasing taper on all sides of both the door and the concrete access opening to form a wedge seal.

(C) If a sliding door mounting is utilized, the mounting apparatus shall be on the inside of the makeup room and the door shall be a minimum of two inches larger than the access opening when the door is fully closed.

(D) Makeup room door may be either:

(I) Constructed to the same structural integrity and mounting requirements of (a)(iii)(A) through (C) of this subsection; or

(II) Constructed of plywood not less than two inches thick and overlaid on the outside with a steel plate not less than one-eighth inch thick.

(III) If a door which complies with (iii)(D)(II) of this subsection is used, a berm or barricade shall be installed within six feet of the door. The berm or barricade shall extend at least as high as the top of the door and shall be a minimum of two feet wider than the door on both sides of the door.

(E) For security purposes, one steel padlock having at least five tumblers and a case hardened shackle of at least three-eighths inch diameter is sufficient for locking purposes. Hinges and hasps shall be attached so that they cannot be removed from the outside when in the closed position and with the lock in place.

(v) Interior finish. The inside of all makeup rooms shall be finished and equipped to the following minimum requirements:

(A) Construction shall be fire resistant and nonsparking up to the top of the walls. Nails or screws shall be countersunk, blind nailed, or covered.

(B) Lighting shall be by N.E.C. explosion-proof rated fixtures and all wiring shall be in sealed conduit.

(C) Control switches shall be outside the makeup room.

(D) No electrical outlet boxes are permissible inside the room.

(b) Restrictions.

(i) Smoking, matches, open flames, or flame or spark-producing devices shall not be permitted inside the makeup room.

(ii) Flammable liquids or flammable compressed gases shall not be stored in the makeup room.

(iii) Signs limiting entry to authorized personnel shall be posted on the door(s).

(iv) A sign stating the occupancy rules shall be posted inside the makeup room where it is clearly legible upon entering the room. The sign shall post the following rules:

(A) Occupancy shall be restricted to specifically authorized personnel;

(B) Smoking, matches, flame or spark-producing devices, tools or equipment shall not be permitted in the

room at any time when explosives or explosive components are present; and

(C) Flammable fuels or compressed gases shall not be permitted inside the room nor stored within fifty feet of the room.

(v) Heating units shall be limited to:

(A) Forced air systems with the heating unit located outside the room.

(B) Steam systems of 15 psig or less.

(C) Hot water systems of 130°F or less.

(D) The radiant heating coils and piping for steam or hot water systems shall be protected so that explosives cannot come into contact with them.

(E) Heating ducts shall be installed so that the hot air does not discharge directly on explosives.

(F) The heating system used in a makeup room shall have controls which prevent the ambient room temperature from exceeding 130°F.

(vi) The makeup room shall be equipped with a portable fire extinguisher of at least 2A-20BC rating.

(vii) Ventilation.

(A) The makeup room shall be equipped with a ventilation system capable of maintaining a minimum rate of three air exchanges per hour during all times when explosives are present in the room.

(B) Fans and controls shall be located outside the makeup room and shall be of a type approved for this service.

(C) The lighting circuit control shall also activate the ventilation fan and the ventilation fan shall be operated whenever personnel are in the room.

(D) Exhaust ventilation shall be arranged to discharge into outside air, not into an enclosed structure.

(viii) The floor or exterior walls may be constructed with duct openings for heating and ventilation purposes provided that:

(A) Each duct opening is not greater in volume than seventy-two square inches;

(B) The combined number of duct openings shall not exceed three;

(C) Duct openings shall be located within twelve inches of the floor or ceiling;

(D) The exhaust duct opening shall not be located on the wall above the makeup workbench.

(c) Practices and procedures.

(i) When explosives are present in the makeup room, entry into the makeup room shall be restricted to trained and authorized personnel.

(ii) The access door(s) to the makeup room shall be kept locked or bolted from the inside while employees are assembling explosives.

(iii) The entire makeup room shall be kept clean, orderly, and free of burnable rubbish.

(iv) Brooms and other cleaning utensils shall not have any spark-producing metal parts if used when explosives are present.

(v) Sweepings and empty explosives containers shall be disposed of as recommended by the explosives supplier.

(vi) Repair activities which utilize spark-producing tools shall not be conducted on any part of the makeup room while explosives are present.

(d) Storage of explosives.

(i) A makeup room shall not be used for the unattended storage of class A explosives.

(ii) A makeup room which meets all requirements of this chapter may contain a class 3 storage facility, for one thousand or less blasting caps.

(iii) A class 3 storage facility shall be constructed to meet the following minimum requirements:

(A) A class 3 storage facility shall be fire resistant and theft resistant. It does not need to be bullet resistant and weather resistant if the locked makeup room provides protection from weather and bullet penetration.

(B) Sides, bottoms, and covers shall be constructed of not less than number twelve gauge metal and lined with a nonsparking material.

(C) Hinges and hasps shall be attached so that they cannot be removed from the outside.

(D) One steel padlock having at least five tumblers and a case-hardened shackle of at least three-eighths inch diameter is sufficient for locking purposes. The lock and hasp is not required to be equipped with a steel hood.

(e) Location.

(i) The makeup room shall be located in accordance with the American Quantity and Distance Separation Tables as adopted in chapter 70.74 RCW "Washington State Explosives Act" and chapter 296-52 WAC "Safety standards for the possession and handling of explosives," except under conditions as indicated in this section.

(ii) Where locating the makeup room in accordance with the quantity and distance separation table is impractical because of bad weather accessibility, rough terrain, or space availability:

(A) Upon application the department will issue a variance enabling location of the makeup room, by mutual agreement, at the safest possible location within the limitation of the individual base area.

(B) The safest possible location will be the location most isolated from assembly areas and buildings that are inhabited with application of additional protection measures such as:

(I) Berming.

(II) Locating natural obstructions or buildings that are not inhabited between the makeup room and assembly areas and buildings that are inhabited.

(III) Limitations on the total quantity of explosives in the makeup room at any one time.

(iii) Makeup rooms designed to hold the boxes of explosives awaiting makeup and the makeup explosives in avalanche control packs awaiting distribution may be located using the total quantity of explosives allowed at the makeup table at any one time as the referenced quantity of explosives provided.

(A) The makeup room is located in accordance with the American Quantity and Distance Separation Tables as adopted in chapter 70.74 RCW "Washington State Explosives Act" and chapter 296-52 WAC "Safety

standards for the possession and handling of explosives" for the referenced quantity of explosives at the makeup table.

(I) This separation shall apply only to human proximity to the makeup room and only at such time as there are explosives in the makeup room.

(II) When the makeup room does not contain explosives the separation tables shall not apply.

(B) The concrete walls of the room are designed to withstand the explosion of the total amount of the referenced explosives.

(I) The concrete walls must be constructed in accordance with specifications designed and certified by a licensed engineer; or

(II) The concrete walls must be constructed to the specifications of Department of the Army TM5-1300 "Structures to Resist the Effects of Accidental Explosions" designed to produce walls which will withstand explosion of the referenced quantity explosives.

(C) The boxes of explosives awaiting makeup and the makeup explosives in avalanche control packs awaiting distribution are located behind separate concrete debris barrier walls which will ensure that detonation of these explosives will not occur if the explosives at the makeup table detonate.

(I) The concrete debris barrier wall must be constructed in accordance with specifications designed and certified by a licensed engineer; or

(II) The concrete debris barrier wall must be constructed to the specifications of Department of the Army TM5-1300 "Structures to Resist the Effects of Accidental Explosions" to produce a barrier which will not allow detonation of the explosives awaiting makeup and distribution should the referenced quantity of explosives detonate.

(III) Access from the makeup table to the area behind the concrete debris barrier walls shall not be doored. The concrete debris barrier walls will be designed so that the access way from the makeup table to the area behind the concrete debris barrier wall will deflect debris from an explosive blast by inherent design.

(D) The roof shall be designed so that the resistance to an interior explosive blast will be negligible.

(iv) A full containment makeup room may be located anywhere and must meet the following requirements:

(A) The makeup room must be constructed in accordance with a licensed explosive engineer's approved design.

(B) The total amount of explosives in the room at anytime must not exceed the design limit of the room.

(C) The makeup room cannot be used for storage.

(v) This section shall become effective December 1, 1989.

Note: Explosives shall be stored in licensed magazines only. All magazines must be located in compliance with the American Quantity and Distance Separation Tables until the United States Treasury Department Bureau of Alcohol, Tobacco and Firearms approves full containment class 1 magazines for storage at distances less than those specified in the American Standard Quantity and Distance Separation Tables and the Washington state department of labor and industries adopts corresponding amendments.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-105, filed 7/6/88.]

WAC 296-59-107 Avalanche control blasting. (1) The employer shall ensure that all members of avalanche control blasting crews are competent ski mountaineers in good physical and mental condition.

(2) Each avalanche control blasting crew or team shall consist of a qualified and licensed blaster and at least one trained assistant.

(3) Untrained personnel may accompany blasting crews for training purposes but shall not participate in actual firing of charges until trained and authorized.

(4) The blaster in charge of each crew or team shall be responsible for all phases of preparation and placement of charges.

(5) Avalanche control blasting should be conducted during daylight hours whenever possible.

(6) Escape route.

(a) The avalanche control crew or team shall preplan the escape route before igniting any charge.

(b) The escape route shall be as safe and foolproof as possible and shall culminate behind a terrain barrier or at least one hundred feet from the blast site by the time of detonation.

(7) Hand-thrown charges.

(a) A blaster shall only work with one charge at a time.

(b) Before attaching the igniter, the blaster must:

(i) Be at the start of the escape route;

(ii) Check the runout zone for personnel;

(iii) Check the blast area for personnel.

(c) After the blaster attaches and activates the igniter:

(i) The blaster shall check to see that the fuse is ignited;

(ii) If the fuse did not ignite, the blaster may reclip the fuse and attempt to light the fuse again with another igniter;

(iii) As soon as the fuse is ignited, the blaster shall promptly throw the charge into the target area;

(iv) All personnel shall proceed immediately along the escape route as soon as an ignited charge is thrown.

(d) Where hand-thrown charges will slide down the hill on hard frozen snow or ice surface, charges shall be belayed with light cord.

(8) Handcharges thrown from ski lifts or trams.

(a) The number of charges thrown from ski lifts or trams shall be kept to a minimum.

(b) The lift operating crew shall be informed of the blasting plans.

(c) The lift crew shall stand by for emergency procedures such as transfer of lift onto auxiliary power, evacuation, etc.

(d) The lift crew and the blaster in charge shall be in direct radio contact at all times during the blasting operations.

(e) Only the avalanche control blasting crew and the essential lift operating personnel shall be on a lift or tram during blasting operations.

(f) The avalanche control blasting crew shall be traveling up-slope when a charge is thrown.

(g) A charge shall always be thrown down slope and to the side, away from towers, haulropes and other equipment or facilities.

(h) The minimum distance from the blast target to the closest point of the lift shall be sixty feet.

(i) Handcharges shall not exceed 4.5 pounds of TNT equivalent.

(j) Fuses shall be timed and cut to such length that all personnel on the lift will have moved a minimum of three hundred feet from the blast target by the time of detonation.

(k) Precautions shall be taken to avoid tossing charges into any of the lift equipment, moving chairs, cables, towers, etc.

(9) Handcharges thrown from aircraft.

(a) Blasting from aircraft shall require a written program approved by the Federal Aviation Administration and the director of the department of labor and industries.

(b) A written program shall include the following:

(i) Written procedures to be followed including provisions for safety in the avalanche runout zone and emergency rescue plans.

(ii) Handcharge makeup and handling procedures.

(iii) The type of explosives to be used.

(iv) The qualifications of all personnel involved.

(v) The specific locations where aircraft blasting is to take place.

Note: Requests for blasting from aircraft will not be granted unless it is determined that conventional methods are not feasible or are more hazardous.

(10) Avalancher requirements.

(a) Management shall develop a written training program and ensure that every person who will be authorized to work on an avalancher firing team is thoroughly trained. Training shall include:

(i) All operating instructions;

(ii) Safety precautions;

(iii) Emergency procedures;

(iv) Securing requirements for the equipment.

(b) Authorized operators shall be listed on a posted operator's list.

(c) Only trained and authorized personnel shall be permitted to point and fire an avalancher with explosive rounds.

(d) During firing of explosive loaded rounds, the firing team shall consist of two qualified operators and not more than one adequately trained helper.

(e) Operators must have a current state blasting license.

(f) Each operator shall individually check the elevation, pointing and pressure settings of the gun before each shot is fired.

(g) Operators shall attempt to determine and record whether or not each round which is fired actually explodes on contact.

(h) The approximate location of all known duds shall be recorded.

(i) Initial shooting coordinates for each avalancher mount shall be made during periods of good visibility.

(j) Testing shall include test firing in various wind conditions.

(k) The correct coordinates for the various conditions encountered shall be carefully recorded.

(l) When spotter personnel are used in the target area, shooting shall be conducted with nonexplosive projectiles.

(m) Firing of explosive avalancher rounds shall only be conducted when personnel are not in the target area.

(n) The avalancher apparatus shall be stored in a nonfunctional condition when not in use. This shall be accomplished by:

(i) Locking out the firing mechanism or gas source in accordance with the lockout requirements of this chapter; or

(ii) Disassembly of functional components rendering the gun inoperable and separate storage of components removed; or

(iii) Removal of the entire gun to secure storage.

(o) With established avalancher mounts, each autumn when reinstalling guns, the following procedures shall be accomplished before the gun is considered operable:

(i) All components shall be carefully inspected by qualified personnel;

(ii) After assembly and installation, the gun shall first be test fired using a nonexplosive projectile;

(iii) The established firing coordinates shall be checked by test firing.

(11) Cornice control requirements.

(a) Cornice buildup hazards shall be evaluated regularly by qualified personnel, particularly after heavy snowfall periods which are accompanied by high wind or other snow transport weather conditions.

(b) Cornice hazards shall be controlled whenever the buildup appears to offer potential hazard to areas accessible by personnel.

(c) The control team shall establish the tension breakline of the cornice roof as accurately as conditions permit before starting any other control work on the cornice.

(d) The tension breakline shall be marked when necessary.

(e) Small lightly packed cornices may be kicked off with a ski, ski pole, or shovel by an unbelayed control team member if the ridgeline can be clearly established and all work can be done from the safe side of the ridgeline.

(f) When working along an anticipated cornice breakline, control team members shall retreat back from the breakline to change work positions rather than traverse along the breakline.

(g) The following factors shall be given careful consideration before commencing control activities on any relatively larger cornice:

(i) The older and larger a cornice becomes the more densely it compacts. Densely packed cornices release into larger blocks offering a higher level of danger to an extended runout zone. The control team leader shall therefore take highest level of precautions to assure that the runout zone is clear of personnel;

(ii) Larger size cornices result in increased suspended weight and leverage which may cause the breakline release fracture to occur behind the actual ridgeline. The actual ridgeline may also be obscured by the simple mass of larger cornices. Control team members shall stay off the cornice roof and must be protected by a secure belay when working near the suspected breakline;

(iii) All large cornices shall be released by explosives. Explosives shall be transported, made up and fired in accordance with the following requirements:

(A) The ignition system for single charge blasts shall be safety fuse and cap.

(B) Detonating cord shall be used to connect multiple charge blasts.

(C) When detonating cord is used, one end shall be securely anchored where premature cornice collapse will not disturb the anchor. The fuse and cap shall be attached to the free end of the detonating cord after all charges are connected to the detonating cord.

(D) Safety fuse length shall be sufficient to permit adequate escapement time for all personnel from the area influenced by the blast. Safety fuse shall be not less than three feet long, approximately two minutes and twenty seconds, in all instances.

(h) Cornice control work on large cornices shall be conducted during daylight hours and preferably during favorable weather conditions. As a minimum, clear visibility shall exist across the full length of any cornice which the control team is attempting to release.

(12) Belaying practices.

(a) Belay rope shall be standard 11 mm mountaineering rope or the equivalent.

(i) Belay rope shall be inspected at not less than thirty day intervals and maintained in excellent condition.

(ii) Defective belay rope shall not be used for belaying purposes.

(b) Adequate trees or other suitable natural belay anchors shall be used in preference to a human belay anchor when such natural anchors are available.

(c) The belay anchor position shall be as near to ninety degrees from the tension breakline as the terrain conditions will permit.

(d) With either a natural belay anchor or human belay anchor, the belay line shall be tended to keep slack out of the line.

(e) When either the belayed person or belay anchor needs to change position, the belayed person shall retreat back from the cornice to a safe position until the belay anchor is reestablished.

(f) When a human belay anchor is used:

(i) The belay anchor person shall establish the anchor position as far back away from the cornice as conditions permit;

(ii) The anchor person shall remain in a seated position with their legs pointed toward the belayed person until such time as the belayed person has retreated back from the cornice to a position considered to be safe.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-107, filed 7/6/88.]

[1988 WAC Supp—page 1656]

WAC 296-59-109 Retrieving misfires or duds. (1) The following requirements shall apply to all kinds of avalanche control blasting:

(a) Each person who ignites a charge or propels a charged projectile with any kind of apparatus shall note whether or not the charge actually detonates.

(b) A conscientious effort shall be made to promptly retrieve any misfire or dud.

(i) If conditions make it impractical or dangerous to promptly retrieve a dud, a search shall be conducted as soon as conditions permit.

(ii) Any area which contains a dud shall be closed to entry to all personnel except the search team until such time as the area has been searched and pronounced safe by the designated search leader.

(c) When searching for a dud on an uncontrolled avalanche slope (a slope which has not released), the procedures used shall be consistent with good mountaineering practices.

(d) A handcharge dud shall not be approached for at least fifteen minutes.

(e) Any dud which is aflame or emitting smoke shall not be approached for at least one hour after evidence of combustion ceases.

(f) A handcharge or avalancher dud may be blown up with a secondary charge where they are found or may be disarmed at that location by fully trained and qualified personnel.

(g) Military warhead duds shall not be moved. They shall be blown up where they are found by secondary charges except that trained military personnel may disarm and transport such duds when approved by the governmental branch having jurisdiction.

(2) Records.

(a) Accurate records shall be maintained for every explosive device which does not detonate.

(b) Dud records shall include the following information:

(i) The suspected location;

(ii) A description of the dud;

(iii) The date the dud was lost;

(iv) The date the dud was found and disposed of.

(3) Dud frequency.

(a) Dud frequency should be maintained below one dud for every five hundred detonating attempts.

(b) Any employer who does not maintain a dud frequency below one dud per five hundred detonation attempts shall investigate all aspects of the blasting program and take prompt corrective actions as indicated.

(4) Dud warning signs.

(a) Ski area operations which use any form of explosive device for avalanche control shall display warning and information placards and/or signs.

(b) Signs shall be posted at readily visible locations and in such a manner as to give both employees and the public ample opportunity to be informed of the potential existence of dud avalanche charges. Locations may include but are not limited to:

(i) Ticket sales and lift loading areas;

(ii) Food and beverage service facilities;

(iii) Restrooms and locker rooms;

- (iv) Safety bulletin boards;
- (v) Along general access routes.
- (c) Signs shall be distinctive in appearance from the surrounding background where they are posted.
- (d) Signs shall be maintained in legible condition.
- (e) Signs shall include the following information:
 - (i) The word "WARNING" or "DANGER" at the top of the sign in the largest lettering on the sign;
 - (ii) The words "Explosives on the mountain";
 - (iii) A colored pictorial illustration which also provides information on dimensions of each type of explosive device used in the area;
 - (iv) The sign wording shall conclude with specific instructions to be followed by anyone who locates an unexploded explosive device.

Note: An example dud warning sign is illustrated in Appendix 1.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-109, filed 7/6/88.]

WAC 296-59-115 Ski lift facilities and structures.

(1) Existing ski lift facilities and structures shall not be required to be retrofitted with standard construction work platforms, walkways, stairs or guardrails on exterior surfaces when such features would add significantly to snow loading considerations. When such standard protective features are omitted, alternative personal protective measures shall be used where possible. Examples include but are not limited to: Safety belt and lanyard, ladder climbing safety devices, temporary work platforms or scaffolds, temporary or removable handrails, guardrails, or walkways.

(2) Snow removal.

(a) During the operating season, standard guardrails which would interfere with snow removal may be omitted in areas where it can be anticipated that frequent snow removal will be necessary to maintain operability of ski lift apparatus. Examples could include but are not limited to the motor house roof or loading and unloading areas.

(b) Personnel barricades, signs, or other devices shall be used to deflect traffic or warn personnel of existing fall hazards.

(3) All ski lift towers installed after the effective date of this standard shall be equipped with permanent ladders or steps which meet the following minimum requirements:

(a) The minimum design live load shall be a single concentrated load of two hundred pounds.

(b) The number and position of additional concentrated live load units of two hundred pounds each as determined from anticipated usage of the ladder shall be considered in the design.

(c) The live loads imposed by persons occupying the ladder shall be considered to be concentrated at such points as will cause the maximum stress in the structural member being considered.

(d) The weight of the ladder and attached appurtenances together with the live load shall be considered in the design of rails and fastenings.

(e) All rungs shall have a minimum diameter of three-fourths inch.

(f) The distance between rungs on steps shall not exceed twelve inches and shall be uniform throughout the ladder length. The top rung shall be located at the level of the landing or equipment served by the ladder.

(g) The minimum clear length of rungs or steps shall be sixteen inches on new installations.

(h) Rungs, cleats, and steps shall be free of sharp edges, burrs, or projections which may be a hazard.

(i) The rungs of an individual-rung ladder shall be so designed that the foot cannot slide off the end. (A suggested design is shown in Figure D-1, at the end of this section.)

(j) Side rails which might be used as a climbing aid shall be of such cross sections as to afford adequate gripping surface without sharp edges or burrs.

(k) Fastenings. Fastenings shall be an integral part of fixed ladder design.

(l) All splices made by whatever means shall meet design requirements as noted in (a) of this subsection. All splices and connections shall have smooth transition with original members and with no sharp or extensive projections.

(m) Adequate means shall be employed to protect dissimilar metals from electrolytic action when such metals are joined.

(n) Welding. All welding shall be in accordance with the "Code for Welding in Building Construction" (AWS D1.0-1966).

(o) Protection from deterioration. Metal ladders and appurtenances shall be painted or otherwise treated to resist corrosion and rusting when location demands.

(4) Installation and clearance.

(a) Pitch.

(i) The preferred pitch of fixed ladders is between the range of seventy-five degrees and ninety degrees with the horizontal (Figure D-4).

(ii) Substandard pitch. Fixed ladders shall be considered as substandard if they are installed within the substandard pitch range of forty-five and seventy-five degrees with the horizontal. Substandard fixed ladders are permitted only where it is found necessary to meet conditions of installation. This substandard pitch range is considered as a critical range to be avoided, if possible.

(iii) Pitch greater than ninety degrees. Ladders having a pitch in excess of ninety degrees with the horizontal are prohibited.

(b) Clearances.

(i) The perpendicular distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder shall be thirty-six inches for a pitch of seventy-six degrees, and thirty inches for a pitch of ninety degrees (Figure D-2), with minimum clearances for intermediate pitches varying between these two limits in proportion to the slope.

(ii) A clear width of at least fifteen inches shall be provided each way from the centerline of the ladder in the climbing space.

(iii) The side rails of through or side-step ladder extensions shall extend three and one-half feet above parapets and landings.

(A) For through ladder extensions, the rungs shall be omitted from the extension and shall have not less than eighteen nor more than twenty-four inches clearance between rails.

(B) For side-step or offset fixed ladder sections, at landings, the side rails and rungs shall be carried to the next regular rung beyond or above the three and one-half feet minimum.

(iv) Grab bars shall be spaced by a continuation of the rung spacing when they are located in the horizontal position. Vertical grab bars shall have the same spacing as the ladder side rails. Grab bar diameters shall be the equivalent of the round-rung diameters.

(v) Clearance in back of ladder. The distance from the centerline of rungs, cleats, or steps to the nearest permanent object in back of the ladder shall be not less than seven inches, except that when unavoidable obstructions are encountered, minimum clearances as shown in Figure D-3 shall be provided.

(vi) Clearance in back of grab bar. The distance from the centerline of the grab bar to the nearest permanent object in back of the grab bars shall be not less than four inches. Grab bars shall not protrude on the climbing side beyond the rungs of the ladder which they serve.

(c) The step-across distance from the nearest edge of a ladder to the nearest edge of the equipment or structure shall be not more than twelve inches, or less than two and one-half inches. However, the step-across distance may be as much as twenty inches provided:

(i) The climber is wearing a safety belt and lanyard; and

(ii) The lanyard is attached to the tower structure before the climber steps off the ladder.

(5) Ski lift towers are not required to be equipped with ladder cages, platforms or landings.

(6) Maintenance and use.

(a) All ladders shall be maintained in a safe condition. All ladders shall be inspected regularly, with the intervals between inspections being determined by use and exposure.

(b) When ascending or descending, the climber must face the ladder.

(c) Personnel shall not ascend or descend ladders while carrying tools or materials which could interfere with the free use of both hands.

(7) Personnel shall be provided with and shall use ladder safety devices or safety belt and lanyard whenever feasible.

(8) Personnel shall not place mobile equipment or personal equipment such as skis, ski poles, or large tools within the falling radius of the lift tower while climbing or working on the lift tower.

(9) Ski lift towers and terminals are not required to be equipped with sheave guards on the haulrope wheels.

(10) Ski lift towers are not required to be equipped with work platforms.

(11) Personnel shall use personal protective equipment such as a safety belt and lanyard when working at unprotected elevated locations. Exception to this requirement shall only be permitted for emergency rescue or emergency inspection if a safety belt and lanyard is not immediately available. Required personal protective equipment shall be made available as quickly as possible.

(12) When fixed ladders on towers do not reach all the way down to the ground or snow level, a specifically designed and constructed portable ladder shall be used for access to and from the fixed ladder. Portable ladders shall be constructed and maintained to the following requirements:

(a) The portable ladder shall be constructed in accordance with applicable provisions of subsection (3) of this section.

(b) The portable ladder shall be constructed with a minimum of two attachment hooks near the top to be utilized for securing the portable ladder onto the fixed ladder.

(c) The attachment hooks shall be installed to support the portable ladder near the fixed ladder siderails.

(d) Rungs or steps on the portable ladder shall be spaced to be identical with rungs or steps on the fixed ladder when the portable ladder is attached for use. The design criteria shall be to achieve a horizontal plane relationship on the top (walking surface) portion of both steps when overlapping is necessary.

(e) The portable ladder shall be equipped with a hold-out device near the bottom to assure clearance behind the steps as required by subsection (4)(b)(v) of this section.

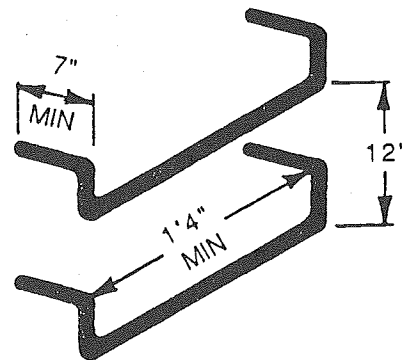


FIGURE D-1

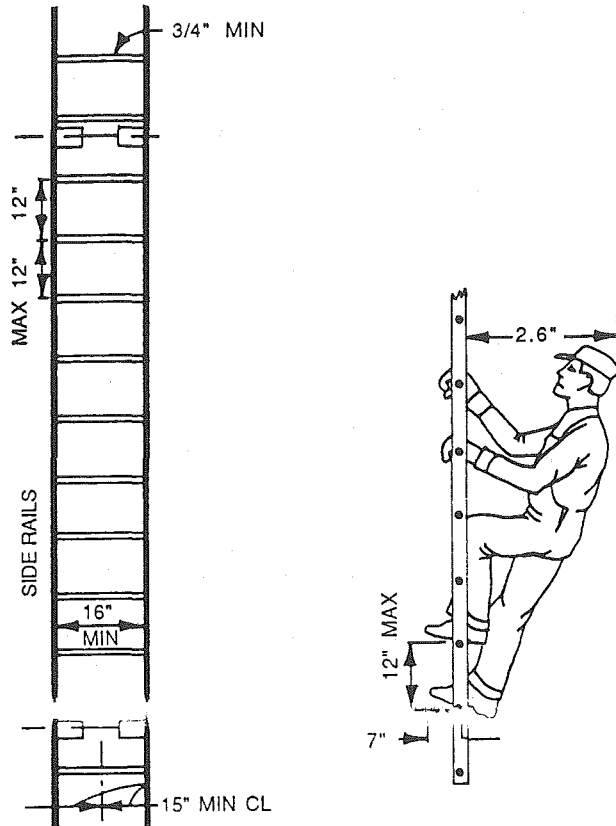


FIGURE D-2
Minimum Ladder Clearance

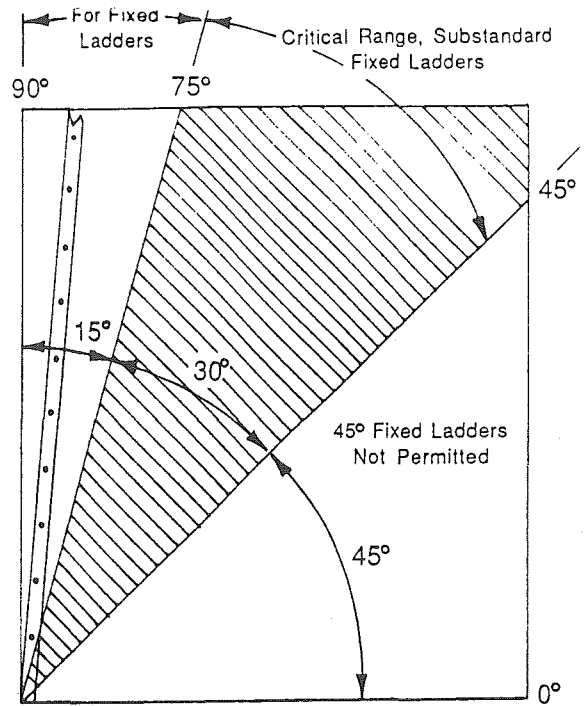


FIGURE D-4
Fixed Ladder Range

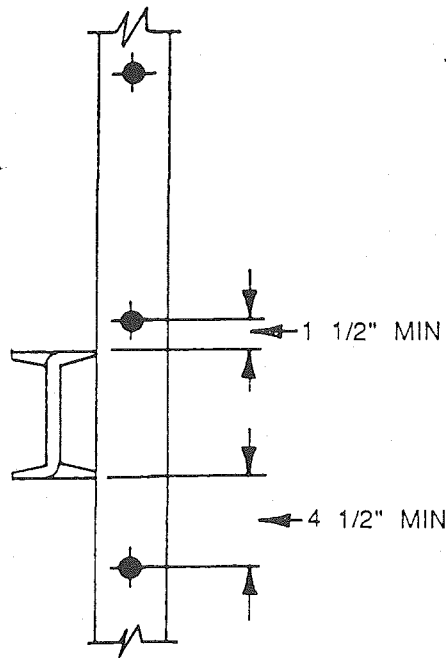


FIGURE D-3
Clearance for Unavoidable Obstruction
at Rear of Fixed Ladder.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-115, filed 7/6/88.]

WAC 296-59-120 Ski lift operations. (1) Operators.

(a) Only trained and qualified lift operators shall be permitted to operate any lift while it is carrying passengers.

(b) Management designated trainees shall only be permitted to operate a lift while under the direct supervision of a qualified operator or trainer.

(c) Initial training of operators shall be accomplished when the lift is not carrying passengers.

(d) Operator training shall include:

(i) Standard and emergency start-up procedures;

(ii) Standard and emergency stopping procedures;

(iii) Lockout procedures;

(iv) Corrective actions for operating malfunctions;

(v) Specific instructions on who to contact for different kinds of rescue emergencies;

(vi) Specific instructions on standard operating procedures with respect to the hazard of loading or unloading passengers proximate to the moving lift chairs.

(2) Operators and helpers shall prepare and maintain the loading and unloading work stations in a leveled condition and, to the extent possible, free from slipping hazards caused by ice, ruts, excessive snow accumulation, tools, etc.

(3) Daily start-up procedure.

(a) Loading station operators shall test all operating controls and stopping controls before permitting any personnel or passengers to load on the lift.

(b) The lift must travel a distance of two times the longest tower span before any employee can load on a chair to go to the remote station.

(c) A qualified operator shall be the first passenger on each lift each day.

Exception: The avalanche control team and the emergency rescue team may use any operable lift at anytime for that work. They may use lifts without a remote operator provided that direct communications are maintained to the operator and the operator has successfully completed normal daily safety and operating control checks at the operating station in use.

(d) Enroute to the remote station, the remote operator shall visually inspect each tower as the chair or gondola proceeds to the remote station.

(e) The remote operator shall stop the system when he/she has reached the remote control station. The operator shall then conduct the daily safety and operating control checks on the remote station.

(f) The remote operator shall ensure that the unloading area is groomed to adequately accommodate normal unloading.

(g) When all controls are checked and functioning correctly and the unloading area is prepared, the remote operator shall communicate to the operator that the system can be placed in normal operation.

(4) Operators shall report to their work station wearing adequate clothing for inclement weather which may be encountered. This requirement shall include reasonably water resistant footwear which shall have a slip resistant sole tread.

(5) While the lift is in operation and carrying passengers, operators shall not permit any activity in the loading/unloading areas which could distract their attention from the principle duty of safely loading or unloading passengers.

(6) Means of communication shall be maintained between the top operator and bottom operator stations.

[Statutory Authority: Chapter 49.17 RCW, 88-14-108 (Order 88-11), § 296-59-120, filed 7/6/88.]

WAC 296-59-125 Ski lift aerial work platforms.

(1) Construction and loading.

(a) All aerial work platforms shall be constructed to sustain the permissible loading with a safety factor of four. The load permitted shall be calculated to include:

(i) The weight of the platform and all suspension components;

(ii) The weight of each permitted occupant calculated at two hundred fifty pounds per person including limited handtools;

(iii) The weight of any additional heavy tools, equipment, or supplies for tasks commonly accomplished from the work platform.

(b) The floor of the platform shall not have openings larger than two inches in the greatest dimension.

(c) The platform shall be equipped with toeboards at least four inches high on all sides.

(d) Guardrails.

(i) The platform shall be equipped with standard height and strength guardrails where such guardrails will pass through the configuration of all lifts on which it is intended to be used.

(ii) Where guardrails must be less than thirty-six inches high in order to clear carriages, guideage, etc., guardrails shall be as high as will clear the obstructions but never less than twelve inches high.

(iii) If the work platform is equipped with an upper work level, the upper level platform shall be equipped with a toeboard at least four inches high.

(iv) Each platform shall be equipped with a lanyard attachment ring for each permissible occupant to attach a safety belt lanyard.

(v) Each lanyard attachment ring shall be of such strength as to sustain five thousand four hundred pounds of static loading for each occupant permitted to be attached to a specific ring.

(vi) Attachment rings shall be permanently located as close to the center balance point of the platform as is practical.

(vii) The rings may be movable, for instance, up and down a central suspension rod, but shall not be completely removable.

(e) Platform attachment.

(i) The platform shall be suspended by either a standard wire rope four part bridle or by solid metal rods, bars, or pipe.

(ii) The attachment means chosen shall be of a type which will prevent accidental displacement.

(iii) The attachment means shall be adjusted so that the platform rides level when empty.

(f) Maintenance.

(i) Every aerial work platform shall be subjected to a complete annual inspection by qualified personnel.

(ii) The inspection shall include all structural members, welding, bolted or treaded fittings, and the suspension components.

(iii) Any defect noted shall be repaired before the platform is placed back in service.

(iv) A written record shall be kept for each annual inspection. The record shall include:

(A) The inspector identification;

(B) All defects found;

(C) The identity of repair personnel;

(D) Identity of the post-repair inspector who accepted the platform for use.

(g) The platform shall be clearly identified as to the number of permissible passengers and the weight limit of additional cargo permitted.

(i) Signs shall be applied on the outside of each side panel.

(ii) Signs shall be maintained in clearly legible condition.

(h) Unless the side guardrail assembly is at least thirty-six inches high on all sides, signs shall be placed on the inside floor or walls to clearly inform all passengers that they must use a safety belt and lanyard at all times when using the platform.

(2) Work platform use.

(a) Platforms shall be attached to the haulrope with an attachment means which develops a four to one strength factor for the combined weight of the platform and all permissible loading.

(b) The haulrope attachment means shall be designed to prevent accidental displacement.

(c) Trained and competent personnel shall attach and inspect the platform before each use.

(d) Passengers shall be provided with and shall use the correct safety harness and lanyard for the intended work.

(e) Any time a passenger's position is not protected by a standard guardrail at least thirty-six inches high, the individual shall be protected by a short lanyard which will not permit free-fall over the platform edge.

(f) When personnel are passengers on a work platform and their work position requires the use of a safety harness and lanyard, the lanyard shall be attached to the work platform, not to the haulrope or tower.

(g) Work platform passengers shall face in the direction of travel when the lift is moving.

(h) Tools, equipment and supplies shall be loaded on the platform in such a fashion that the loaded platform can safely pass all towers and appurtenances.

(i) Heavy tools, equipment or supplies shall be secured in place if they could fall over or roll within the platform and create a hazard for passengers.

(j) When the work crew is traveling on the work platform, the lift shall be operated at a speed which is safe for that particular system and the conditions present.

Note: See Appendix 2 for operating procedure requirements.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-125, filed 7/6/88.]

WAC 296-59-130 Ski lift machinery guarding. (1) Moving machine parts that are located within normal reach shall be fitted with safety guards in compliance with WAC 296-24-150 through 296-24-20533, Machinery and machine guarding.

(a) The coupling apparatus for the ski lift emergency drive may be provided with a removable or swing guard.

(b) When removable or swing guards are used, the guard and mounting means shall be so designed and constructed as to sustain a two hundred fifty pound weight loading without displacement.

(2) All guards shall be maintained in good condition and shall be secured in place when the equipment is in operation except for inspection and adjustment purposes.

(3) The drive machinery and primary control apparatus shall be installed in a facility which can prevent access by unauthorized personnel. The access door shall have a sign which states that entry is restricted to authorized personnel.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-59-130, filed 7/6/88.]

WAC 296-59-135 Appendix 1—Nonmandatory alternative lock-out procedure for ski lifts and tows. (1) To ensure the safety of all personnel engaged in lift maintenance activities, we insist that the following procedure be strictly adhered to.

(a) Criteria.

(i) Equipment shall be deactivated and locked or tagged out before an employee is placed in a position where there is a hazard created by exposure to the components of ski lift or tows, equipment and/or systems.

(ii) This procedure relies on positive communication to indicate when lock-out safety is assured. At any time this crew is working at a location remote from the control station, this procedure shall be used by only one work crew whose members are working in close proximity to one another.

(iii) The operator and all potentially exposed employees shall have a positive means of communication at all times. If anyone loses the communication means, it shall be restored before exposure can occur or lock-out or tag-out can be broken.

(iv) Other radio transmissions breaking in or overriding the communications between control operator and remote work crew, if not controlled, can be a problem. There are considerations that should be followed:

(A) The first preferred method is to provide an isolated radio channel for communications between operator and remote work crew.

(B) If an isolated radio frequency is not possible, the entire area crew should be trained to recognize the radio conversation characteristics of this type of work to be notified when the work is in progress and be required to restrict use of their radios.

(v) All personnel working under this procedure shall be thoroughly trained in the specific procedures to be followed and their individual requirements. The ski lift or tow controls shall be under control of a fully qualified operator at all times.

(vi) Signs shall be posted in motor rooms on the control panel or the master disconnect stating "men working on lifts."

(vii) The control operator shall not leave the close proximity of the control station unless the master disconnect is thrown to the off position and padlocked.

(viii) The "standby drive" shall be locked out of service in such a manner that precludes the operation of the lift by jumping ignition, throwing a clutch, or hooking up a coupling, etc., whenever work is being performed on the equipment or system.

Methods for securing "standby drive" may be, but are not limited to the following:

(A) Removal to secure a location or locking up "standby" drive coupling chain, belts, etc.;

(B) Denying access to the standby motor by locking motor room door.

(ix) When the crew is working at either terminal in proximity of bullwheels, shafts, guideage, gears, belts, chains, etc., the master disconnect shall be thrown to the off position and padlocked.

(b) Work chair.

(i) Prior to crew loading on work chair, controls and communications shall be thoroughly checked to confirm that they are in good working condition.

(ii) The operator and work crew shall discuss and determine the safe speed for that particular lift. At no time

shall the work chair travel around either terminal bullwheel except at a very slow speed.

(iii) Employees riding in the work chair shall face the direction of travel when chair is in motion.

(iv) Employees in work chair shall pay special attention to ensure that equipment or tools, etc., will not be entangled on towers, ramps, or terminals as work chair passes by.

(v) Safety belts are required and there is a designated device on each work chair to hook onto. At no time will it be allowed to hook onto the tower or tower equipment while in the work chair, or hook onto a moving part of the lift if standing on the tower.

(c) Operator and controls.

(i) Manual reset stop switches are required on all lifts. The operator shall check and confirm that the lift cannot be started from any control location when the stop switch is depressed. The operator will leave the stop switch depressed until remote crew directs that they are ready to move.

(ii) Communications between operator and remote work crew will be on name basis. This is especially important if there are other radio communications or other crews working on other lifts.

(2) Summation.

(a) If all these rules are adhered to, the operator can use the control circuit stop switch for repetitive type maintenance on towers. If the remote crew is to be at the location for some time, it is recommended that the operator throw the master disconnect switch to the off position and padlock it.

(b) A padlock on the disconnect switch is required when anybody is working on either terminal.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-59-135, filed 11/14/88.]

Chapter 296-62 WAC

OCCUPATIONAL HEALTH STANDARDS--SAFETY STANDARDS FOR CARCINOGENS

WAC

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- 296-62-07336 Acrylonitrile.
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- 296-62-07340 Appendix D--Sampling and analytical methods for acrylonitrile.
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- 296-62-07342 1,2-Dibromo-3-chloropropane.
- 296-62-07343 Appendix A--Substance safety data sheet for DBCP.
- 296-62-07344 Appendix B--Substance technical guidelines for DBCP.
- 296-62-07345 Repealed.
- 296-62-07346 Appendix C--Medical surveillance guidelines for DBCP.
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- 296-62-07381 Appendices.
- 296-62-07383 Appendix A--Substance safety data sheet for ethylene oxide (nonmandatory).
- 296-62-07385 Appendix B--Substance technical guidelines for ethylene oxide (nonmandatory).
- 296-62-07387 Appendix C--Medical surveillance guidelines for ethylene oxide (nonmandatory).
- 296-62-07389 Appendix D--Sampling and analytical methods for ethylene oxide (nonmandatory).

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- 296-62-07517 Asbestos.
- 296-62-07521 Lead.
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- 296-62-07525 Appendix A substance safety data sheet--Benzene.
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 296-62-07731 Dates.
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 296-62-07735 Appendix A—WISHA reference method—Mandatory.
 296-62-07737 Appendix B—Detailed procedure for asbestos sampling and analysis—Nonmandatory.
 296-62-07739 Appendix C—Qualitative and quantitative fit testing procedures—Mandatory.
 296-62-07741 Appendix D—Medical questionnaires—Mandatory.
 296-62-07743 Appendix E—Interpretation and classification of chest roentgenograms—Mandatory.
 296-62-07745 Appendix F—Work practices and engineering controls for automotive brake repair operations—Nonmandatory.
 296-62-07747 Appendix G—Substance technical information for asbestos—Nonmandatory.
 296-62-07749 Appendix H—Medical surveillance guidelines for asbestos—Nonmandatory.
 296-62-07751 Appendix I—Work practices and engineering controls for major asbestos removal, renovation, and demolition operations—Nonmandatory.
 296-62-07753 Appendix J—Work practices and engineering controls for small-scale, short-duration asbestos renovation and maintenance operations—Nonmandatory.
 296-62-07761 Nonasbestiform tremolite, anthophyllite, and actinolite.

PART N—COTTON DUST

- 296-62-14531 Repealed.
 296-62-14533 Cotton dust.
 296-62-14537 Appendix B—I through B-III—Respiratory questionnaire.
 296-62-14539 Appendix C—Spirometry prediction tables for normal males and females.
 296-62-14541 Appendix D—Pulmonary function standards for cotton dust standard.
 296-62-146 Repealed.
 296-62-14601 Repealed.
 296-62-14603 Repealed.
 296-62-14605 Repealed.
 296-62-14607 Repealed.

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- 296-62-3150 Start-up dates.
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 296-62-3160 Appendix A—Personal protective equipment test methods.
 296-62-3170 Appendix B—General description and discussion of the levels of protection and protective gear.
 296-62-3180 Appendix C—Compliance guidelines.
 296-62-3190 Appendix D—References.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

- 296-62-07341 Acrylonitrile. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-16-009 (Order 86-28), § 296-62-07341, filed 7/25/86. Statutory Authority: RCW 49.17.040, 49.17.050, and 49.17.240. 81-18-029 (Order 81-21), § 296-62-07341, filed 8/27/81; 81-16-015 (Order 81-20), § 296-62-07341, filed 7/27/81; 80-11-010 (Order 80-14), § 296-62-07341, filed 8/8/80. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30, and 43.22 RCW. 78-07-052 (Order 78-10), § 296-62-07341, filed 6/28/78.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
 296-62-07345 1,2-Dibromo-3-chloropropane. [Statutory Authority: RCW 49.17.040 and 49.17.050. 86-16-009 (Order 86-28), § 296-62-07345, filed 7/25/86. Statutory Authority: RCW 49.17.040, 49.17.050, and 49.17.240. 81-18-029 (Order 81-21), § 296-62-07345, filed 8/27/81; 81-16-015 (Order 81-20), § 296-62-07345, filed 7/27/81; 80-11-010 (Order 80-14), § 296-62-07345, filed 8/8/80. Statutory Authority: RCW 49.17.040, 49.17.050, and 49.17.240, chapters 42.30, and 43.22 RCW. 78-07-052 (Order 78-10), § 296-62-07345, filed 6/28/78.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
 296-62-07353 Ethylene oxide. [Statutory Authority: RCW 49.17.050(2) and 49.14.040 [49.17.040]. 87-07-022 (Order 87-01), § 296-62-07353, filed 3/12/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-16-009 (Order 86-28), § 296-62-07353, filed 7/25/86; 85-10-004 (Order 85-09), § 296-62-07353, filed 4/19/85; 85-01-022 (Order 84-24), § 296-62-07353, filed 12/11/84.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
 296-62-07729 Observation of monitoring. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07729, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
 296-62-14531 Exposure to cotton dust in cotton gins. [Statutory Authority: RCW 49.17.040, 49.17.050, and 49.17.240. 81-18-029 (Order 81-21), § 296-62-14531, filed 8/27/81; 81-16-015 (Order 81-20), § 296-62-14531, filed 7/27/81; 80-11-010 (Order 80-14), § 296-62-14531, filed 8/8/80. Statutory Authority: RCW 49.17.040, 49.17.150 and 49.17.240. 79-02-037 (Order 79-1), § 296-62-14531, filed 1/23/79.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
 296-62-146 Appendices. [Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-62-146, filed 8/27/81.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
 296-62-14601 Appendix A—Requirements for classification and respiratory use of workers exposed to cotton dust in gins. [Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-62-14601, filed 8/27/81.] Repealed by 88-23-054 (Order 88-25), filed 11/14/88. Statutory Authority: Chapter 49.17 RCW.

- 296-62-14603 Appendix B-1—Respiratory questionnaire. [Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-62-14603, filed 8/27/81.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-62-14605 Appendix C—Spirometry prediction tables for normal males and females. [Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-62-14605, filed 8/27/81.] Repealed by 88-23-054 (Order 88-25), filed 11/14/88. Statutory Authority: Chapter 49.17 RCW.
- 296-62-14607 Appendix D—Pulmonary function standards for cotton dust standard. [Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-62-14607, filed 8/27/81.] Repealed by 88-23-054 (Order 88-25), filed 11/14/88. Statutory Authority: Chapter 49.17 RCW.

PART C—HAZARD COMMUNICATION

WAC 296-62-054 Hazard communication purpose.

(1) The purpose of this section is to ensure that the hazards of all chemicals produced or imported are evaluated, and that information concerning their hazards is transmitted to employers and employees. This transmittal of information is to be accomplished by means of comprehensive hazard communication programs, which are to include container labeling and other forms of warning, material safety data sheets and employee training.

(2) This occupational safety and health standard is intended to address comprehensively the issue of evaluating the potential hazards of chemicals, and communicating information concerning hazards and appropriate protective measures to employees. Evaluating the potential hazards of chemicals, and communicating information concerning hazards and appropriate protective measures to employees, may include, for example, but is not limited to, provisions for: Developing and maintaining a written hazard communication program for the workplace, including lists of hazardous chemicals present; labeling of containers of chemicals in the workplace, as well as of containers of chemicals being shipped to other workplaces; preparation and distribution of material safety data sheets to employees and downstream employers; and development and implementation of employee training programs regarding hazards of chemicals and protective measures.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-62-054, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 84-22-012 (Order 84-22), § 296-62-054, filed 10/30/84; 84-13-001 (Order 84-14), § 296-62-054, filed 6/7/84.]

WAC 296-62-05403 Scope and application. (1)

This section requires chemical manufacturers or importers to assess the hazards of chemicals which they produce or import, and all employers to provide information to their employees about the hazardous chemicals to which they are exposed, by means of a hazard communication program which includes; labels and other forms of warning, material safety data sheets, and information and training. In addition, this section requires distributors to transmit the required information to employers.

(2) This section applies to any chemical which is known to be present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency.

(3) This section applies to laboratories only as follows:

(a) Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced;

(b) Employers shall maintain any material safety data sheets that are received with incoming shipments of hazardous chemicals, and ensure that they are readily accessible to laboratory employees; and,

(c) Employers shall ensure that laboratory employees are apprised of the hazards of the chemicals in their workplaces in accordance with WAC 296-62-05415.

(4) In work operations where employees only handle chemicals in sealed containers which are not opened under normal conditions of use (such as are found in marine cargo handling, warehousing, or retail sales), this section applies to these operations only as follows:

(a) Employers shall ensure that labels on incoming containers of hazardous chemicals are not removed or defaced;

(b) Employers shall maintain copies of any material safety data sheets that are received with incoming shipments of the sealed containers of hazardous chemicals, shall obtain a material safety data sheet for sealed containers of hazardous chemicals received without a material safety data sheet if an employee requests the material safety data sheet, and shall ensure that the material safety data sheets are readily accessible during each work shift to employees when they are in their work area(s); and

(c) Employers shall ensure that employees are provided with information and training in accordance with WAC 296-62-05415 to the extent necessary to protect them in the event of a spill or leak of a hazardous chemical from a sealed container.

(5) This section does not require labeling of the following chemicals:

(a) Any pesticide as such term is defined in the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 et seq.), when subject to the labeling requirements of that act and labeling regulations issued under that act by the Environmental Protection Agency;

(b) Any food, food additive, color additive, drug, cosmetic, or medical or veterinary device, including materials intended for use as ingredients in such products (e.g., flavors and fragrances), as such terms are defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.) and regulations issued under that act, when they are subject to the labeling requirements of that act and labeling regulations issued under that act by the Food and Drug Administration;

(c) Any distilled spirits (beverage alcohols), wine, or malt beverages intended for nonindustrial use, as such terms are defined in the Federal Alcohol Administration Act (27 U.S.C. 201 et seq.) and regulations issued under that act, when subject to the labeling requirements of that act and labeling regulations issued under that act by the Bureau of Alcohol, Tobacco, and Firearms; and,

(d) Any consumer product or hazardous substance as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.) respectively, when subject to a consumer product safety standard or labeling requirement of those acts, or regulations issued under those acts by the Consumer Product Safety Commission.

(6) This section does not apply to:

(a) Any hazardous waste as such term is defined by the Hazardous Waste Management Act chapter 70.105 RCW, when subject to regulations issued under that act by the department of ecology which describes specific safety, labeling, personnel training and other standards for the accumulation, handling and management of hazardous waste;

(b) Tobacco or tobacco products;

(c) Wood or wood products;

(d) Articles;

(e) Food, drugs, cosmetics, or alcoholic beverages in a retail establishment which are packaged for sale to consumers;

(f) Foods, drugs, or cosmetics intended for personal consumption by employees while in the workplace;

(g) Any transportation of a hazardous chemical or substance, provided such transportation is subject to regulations issued by the United States department of transportation or the Washington utilities and transportation commission;

(h) Any consumer product or hazardous substance, as those terms are defined in the Consumer Product Safety Act (15 U.S.C. 2051 et seq.) and Federal Hazardous Substances Act (15 U.S.C. 1261 et seq.) respectively, where the employer can demonstrate it is used in the workplace in the same manner as normal consumer use, and which use results in a duration and frequency of exposure which is not greater than exposures experienced by consumers; and

(i) Any drug, as that term is defined in the Federal Food, Drug, and Cosmetic Act (21 U.S.C. 301 et seq.), when it is in solid, final form for direct administration to the patient (i.e., tablets or pills.)

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-62-05403, filed 7/6/88; 87-24-051 (Order 87-24), § 296-62-05403, filed 11/30/87. Statutory Authority: RCW 49.17.230, 49.70.180, 49.17.040, 49.17.050 and 49.17.240. 86-12-004 (Order 86-22), § 296-62-05403, filed 5/22/86. Statutory Authority: RCW 49.17.040 and 49.17.050. 85-10-004 (Order 85-09), § 296-62-05403, filed 4/19/85; 84-22-012 (Order 84-22), § 296-62-05403, filed 10/30/84; 84-13-001 (Order 84-14), § 296-62-05403, filed 6/7/84.]

WAC 296-62-05405 Definitions applicable to this section. (1) Article means a manufactured item:

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

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

(c) Which does not release, or otherwise result in exposure to, a hazardous chemical under normal conditions of use.

(2) Chemical means any element, chemical compound or mixture of elements and/or compounds.

(3) Chemical manufacturer means an employer with a workplace where chemical(s) are produced for use or distribution.

(4) Chemical name means the scientific designation of a chemical in accordance with the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC) or the Chemical Abstracts Service (CAS) rules of nomenclature, or a name which will clearly identify the chemical for the purpose of conducting a hazard evaluation.

(5) Combustible liquid means any liquid having a flashpoint at or above 100°F (37.8°C), but below 200°F (93.3°C), except any mixture having components with flashpoints of 200°F (93.3°C), or higher, the total volume of which make up ninety-nine percent or more of the total volume of the mixture.

(6) Common name means any designation or identification such as code name, code number, trade name, brand name or generic name used to identify a chemical other than by its chemical name.

(7) Compressed gas means:

(a) A gas or mixture of gases having, in a container, an absolute pressure exceeding 40 psi at 70°F (21.1°C); or

(b) A gas or mixture of gases having, in a container, an absolute pressure exceeding 104 psi at 130°F (54.4°C) regardless of the pressure at 70°F (21.1°C); or

(c) A liquid having a vapor pressure exceeding 40 psi at 100°F (37.8°C) as determined by ASTM D-323-72.

(8) Container means any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of this section, pipes or piping systems are not considered to be containers.

(9) Designated representative means any individual or organization to whom an employee gives written authorization to exercise such employee's rights under this section. A recognized or certified collective bargaining agent shall be treated automatically as a designated representative without regard to written employee authorization.

(10) Director means the director of the department of labor and industries or his/her designee.

(11) Distributor means a business, other than a chemical manufacturer or importer, which supplies hazardous chemicals to other distributors or to employers.

(12) Employee means an employee of an employer who is employed in the business of his or her employer whether by way of manual labor or otherwise and every person in this state who is engaged in the employment of or who is working under an independent contract the essence of which is personal labor for an employer under this standard whether by way of manual labor or otherwise. However, for the purposes of this section, employee shall not mean immediate family members of the officers of any corporation, partnership, sole proprietorship, or other business entity or officers of any closely held corporation engaged in agricultural production of crops or livestock.

(13) Employer means any person, firm, corporation, partnership, business trust, legal representative, or other

business entity that engages in any business, industry, profession, or activity in this state and employs one or more employees or who contract with one or more persons, the essence of which is the personal labor of such person or persons and includes the state, counties, cities, and all municipal corporations, public corporations, political subdivisions of the state, and charitable organizations.

(14) Explosive means a chemical that causes a sudden, almost instantaneous release of pressure, gas, and heat when subjected to sudden shock, pressure, or high temperature.

(15) Exposure or exposed means that an employee is/was subjected to a hazardous chemical in the course of employment through any route of entry (inhalation, ingestion, skin contact or absorption, etc.), and includes potential (e.g., accidental or possible) exposure.

(16) Flammable means a chemical that falls into one of the following categories:

(a) Aerosol flammable: An aerosol that when tested by the method described in 16 CFR 1500.45 yields a flame projection exceeding eighteen inches at full valve opening, or a flashback (a flame extending back to the valve) at any degree of valve opening;

(b) Gas, flammable;

(i) A gas that, at ambient temperature and pressure, forms a flammable mixture with air at a concentration of thirteen percent by volume or less; or

(ii) A gas that, at ambient temperature and pressure, forms a range of flammable mixtures with air wider than twelve percent by volume, regardless of the lower limit;

(c) Liquid, flammable: 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;

(d) Solid, flammable: A solid, other than a blasting agent or explosive as defined in WAC 296-52-030, that is liable to cause fire through friction, absorption of moisture, spontaneous chemical change, or retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious hazard. A chemical shall be considered to be a flammable solid if, when tested by the method described in 16 CFR 1500.44, it ignites and burns with a self-sustained flame at a rate greater than one-tenth of an inch per second along its major axis.

(17) Flashpoint means the minimum temperature at which a liquid gives off a vapor in sufficient concentration to ignite when tested as follows:

(a) Tagliabue closed tester: (See American National Standard Method of Test for Flash Point by Tag Closed Tester, Z11.24-1979 (ASTM D 56-79)) for liquids with a viscosity of less than 45 Saybolt Universal Seconds (SUS) at 100°F (37.8°C), that do not contain suspended solids and do not have a tendency to form a surface film under test; or

(b) Pensky-Martens closed tester: (See American National Standard Method of Test for Flash Point by

Pensky-Martens Closed Tester, Z11.7-1979 (ASTM D 93-79)) for liquids with a viscosity equal to or greater than 45 SUS at 100°F (37.8°C), or that contain suspended solids, or that have a tendency to form a surface film under test; or

(c) Setaflash closed tester: (See American National Standard Method of Test for Flash Point by Setaflash Closed Tester (ASTM D 3278-78)).

Note: Organic peroxides, which undergo autoaccelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified in (a), (b), or (c) of this subsection.

(18) Foreseeable emergency means any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment which could result in an uncontrolled release of a hazardous chemical into the workplace.

(19) Hazardous chemical means any chemical which is a physical hazard or a health hazard.

(20) Hazard warning means any words, pictures, symbols, or combination thereof appearing on a label or other appropriate form of warning which convey the hazard(s) of the chemical(s) in the container(s).

(21) Health hazard means a chemical for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. Appendix A provides further definitions and explanations of the scope of health hazards covered by this section, and Appendix B describes the criteria to be used to determine whether or not a chemical is to be considered hazardous for purposes of this standard.

(22) Identity means any chemical or common name which is indicated on the material safety data sheet (MSDS) for the chemical. The identity used shall permit cross-references to be made among the required list of hazardous chemicals, the label and the MSDS.

(23) Immediate use means that the hazardous chemical will be under the control of and used only by the person who transfers it from a labeled container and only within the work shift in which it is transferred.

(24) Importer means the first business within Washington which receives hazardous chemicals produced in other states or countries, for the purpose of supplying them to distributors or purchasers within Washington.

(25) Label means any written, printed, or graphic material displayed on or affixed to containers of hazardous chemicals.

(26) Material safety data sheet (MSDS) means written or printed material concerning a hazardous chemical which is prepared in accordance with WAC 296-62-05413.

(27) Mixture means any combination of two or more chemicals if the combination is not, in whole or in part, the result of a chemical reaction.

(28) Organic peroxide means an organic compound that contains the bivalent-0-0-structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

(29) Oxidizer means a chemical other than a blasting agent or explosive as defined in WAC 296-52-417, that initiates or promotes combustion in other materials, thereby causing fire either of itself or through the release of oxygen or other gases.

(30) Physical hazard means a chemical for which there is scientifically valid evidence that it is a combustible liquid, a compressed gas, explosive, flammable, an organic peroxide, an oxidizer, pyrophoric, unstable (reactive) or water-reactive.

(31) Produce means to manufacture, process, formulate, or repackage.

(32) Purchaser means an employer with a workplace who purchases a hazardous chemical for use within that workplace.

(33) Pyrophoric means a chemical that will ignite spontaneously in air at a temperature of 130°F (54.4°C) or below.

(34) Responsible party means someone who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

(35) Specific chemical identity means the chemical name, Chemical Abstracts Service (CAS) registry number, or any other information that reveals the precise chemical designation of the substance.

(36) Trade secret means any confidential formula, pattern, process, device, information or compilation of information that is used in an employer's business, and that gives the employer an opportunity to obtain an advantage over competitors who do not know or use it. WAC 296-62-05427, Appendix D, provides a legal definition of trade secret and WAC 296-62-05417 sets out the criteria to be used in evaluating trade secrets.

(37) Unstable (reactive) means a chemical which in the pure state, or as produced or transported, will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure or temperature.

(38) Use means to package, handle, react, or transfer.

(39) Water-reactive means a chemical that reacts with water to release a gas that is either flammable or presents a health hazard.

(40) Work area means a room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.

(41) Workplace means an establishment at one geographical location containing one or more work areas.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-62-05405, filed 7/6/88; 87-24-051 (Order 87-24), § 296-62-05405, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-05405, filed 4/27/87. Statutory Authority: RCW 49.17.230, 49.70.180, 49.17.040, 49.17.050 and 49.17.240. 86-12-004 (Order 86-22), § 296-62-05405, filed 5/22/86. Statutory Authority: RCW 49.17.040 and 49.17.050.

85-10-004 (Order 85-09), § 296-62-05405, filed 4/19/85; 84-22-012 (Order 84-22), § 296-62-05405, filed 10/30/84; 84-13-001 (Order 84-14), § 296-62-05405, filed 6/7/84.]

WAC 296-62-05407 Hazard determination. (1) Chemical manufacturers and importers shall evaluate chemicals produced in their workplaces or imported by them to determine if they are hazardous. Employers are not required to evaluate chemicals unless they choose not to rely on the evaluation performed by the chemical manufacturer or importer for the chemical to satisfy this requirement.

(2) Chemical manufacturers, importers or employers evaluating chemicals shall identify and consider the available scientific evidence concerning physical and health hazards. For health hazards, evidence which is statistically significant and which is based on at least one positive study conducted in accordance with established scientific principles is considered to be sufficient to establish a hazardous effect if the results of the study meet the definition of health hazard in this section. WAC 296-62-05421, Appendix A, shall be consulted for the scope of health hazards covered, and WAC 296-62-05423, Appendix B, shall be consulted for the criteria to be followed with respect to the completeness of the evaluation, and the data to be reported.

(3) The chemical manufacturer, importer or employer evaluating chemicals shall treat the following sources as establishing that the chemicals listed in them are hazardous:

(a) Chapter 296-62 WAC, Occupational health standards—Safety standards for carcinogens; or,

(b) *Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment*, American Conference of Governmental Industrial Hygienists (ACGIH) (latest edition).

Note: The chemical manufacturer, importer, or employer is still responsible for evaluating the hazards associated with the chemicals in these source lists in accordance with the requirements of the standard.

(4) Chemical manufacturers, importers and employers evaluating chemicals shall treat the following sources as establishing that a chemical is a carcinogen or potential carcinogen for hazard communication purposes:

(a) National Toxicology Program (NTP), Annual Report on Carcinogens (latest edition);

(b) International Agency for Research on Cancer (IARC) Monographs (latest editions); or

(c) Chapter 296-62 WAC, Occupational health standards—Safety standards for carcinogens – Part F—Carcinogens.

Note: The *Registry of Toxic Effects of Chemical Substances* published by the National Institute for Occupational Safety and Health indicates whether a chemical has been found by NTP or IARC to be a potential carcinogen.

(5) The chemical manufacturer, importer or employer shall determine the hazards of mixtures of chemicals as follows:

(a) If a mixture has been tested as a whole to determine its hazards, the results of such testing shall be used to determine whether the mixture is hazardous;

(b) If a mixture has not been tested as a whole to determine whether the mixture is a health hazard, the mixture shall be assumed to present the same health hazards as do the components which comprise one percent (by weight or volume) or greater of the mixture, except that the mixture shall be assumed to present a carcinogenic hazard if it contains a component in concentrations of 0.1 percent or greater which is considered to be a carcinogen under WAC 296-62-05407(4);

(c) If a mixture has not been tested as a whole to determine whether the mixture is a physical hazard, the chemical manufacturer, importer, or employer may use whatever scientifically valid data is available to evaluate the physical hazard potential of the mixture; and,

(d) If the chemical manufacturer, importer, or employer has evidence to indicate that a component present in the mixture in concentrations of less than one percent (or in the case of carcinogens, less than 0.1 percent) could be released in concentrations which would exceed an established WISHA permissible exposure limit or ACGIH threshold limit value, or could present a health hazard to employees in those concentrations, the mixture shall be assumed to present the same hazard.

(6) Chemical manufacturers, importers, or employers evaluating chemicals shall describe in writing the procedures they use to determine the hazards of the chemical they evaluate. The written procedures are to be made available, upon request, to employees, their designated representatives, the director or his/her designee. The written description may be incorporated into the written hazard communication program required under WAC 296-62-05409.

[Statutory Authority: Chapter 49.17 RCW, 88-14-108 (Order 88-11), § 296-62-05407, filed 7/6/88. Statutory Authority: RCW 49.17-230, 49.70.180, 49.17.040, 49.17.050 and 49.17.240, 86-12-004 (Order 86-22), § 296-62-05407, filed 5/22/86. Statutory Authority: RCW 49.17.040 and 49.17.050, 84-13-001 (Order 84-14), § 296-62-05407, filed 6/7/84.]

WAC 296-62-05409 Written hazard communication program. (1) Employers shall develop, implement, and maintain at the workplace a written hazard communication program for their workplaces which at least describes how the criteria specified in WAC 296-62-05411, 296-62-05413 and 296-62-05415, for labels and other forms of warning, material safety data sheets, and employee information and training will be met, and which also includes the following:

(a) A list of the hazardous chemicals known to be present using an identity that is referenced on the appropriate material safety data sheet (the list may be compiled for the workplace as a whole or for individual work areas);

(b) The methods the employer will use to inform employees of the hazards of nonroutine tasks (for example, the cleaning of reactor vessels), and the hazards associated with chemicals contained in unlabeled pipes in their work areas.

(2) Multi-employer workplaces. Employers who produce, use, or store hazardous chemicals at a workplace in such a way that the employees of other employer(s) may be exposed (for example, employees of

a construction contractor working on site) shall additionally ensure that the hazard communication programs developed and implemented under this section include the following:

(a) The methods the employer will use to provide the other employer(s) with a copy of the material safety data sheet, or to make it available at a central location in the workplace, for each hazardous chemical the other employer(s)' employees may be exposed to while working;

(b) The methods the employer will use to inform the other employer(s) of any precautionary measures that need to be taken to protect employees during the workplace's normal operating conditions and in foreseeable emergencies; and

(c) The methods the employer will use to inform the other employer(s) of the labeling system used in the workplace.

(3) The employer may rely on an existing hazard communication program to comply with these requirements, provided that it meets the criteria established in this section.

(4) The employer shall make the written hazard communication program available, upon request, to employees, their designated representatives, and the director or his/her designee in accordance with the requirements of WAC 296-62-05209.

[Statutory Authority: Chapter 49.17 RCW, 88-14-108 (Order 88-11), § 296-62-05409, filed 7/6/88. Statutory Authority: RCW 49.17-040 and 49.17.050, 84-13-001 (Order 84-14), § 296-62-05409, filed 6/7/84.]

WAC 296-62-05411 Labels and other forms of warning. (1) The chemical manufacturer, importer, or distributor shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged or marked with the following information:

(a) Identity of the hazardous chemical(s);

(b) Appropriate hazard warnings; and

(c) Name and address of the chemical manufacturer, importer, or other responsible party.

(2) For solid metal (such as a steel beam or a metal casting) that is not exempted as an article due to its downstream use, the required label may be transmitted to the customer at the time of the initial shipment, and need not be included with subsequent shipments to the same employer unless the information on the label changes. The label may be transmitted with the initial shipment itself, or with the material safety data sheet that is to be provided prior to or at the time of the first shipment. This exception to requiring labels on every container of hazardous chemicals is only for the solid metal itself and does not apply to hazardous chemicals used in conjunction with, or known to be present with, the metal and to which employees handling the metal may be exposed (for example, cutting fluids or lubricants.)

(3) Chemical manufacturers, importers, or distributors shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged, or marked in accordance with this section in a manner

which does not conflict with the requirements of the Hazardous Materials Transportation Act (18 U.S.C. 1801 et seq.) and regulations issued under that act by the department of transportation.

(4) If the hazardous chemical is regulated by WISHA in a substance-specific health standard, the chemical manufacturer, importer, distributor or employer shall ensure that the labels or other forms of warning used are in accordance with the requirements of that standard.

(5) Except as provided in subsection (6) and (7) of this section, the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:

(a) Identity of the hazardous chemical(s) contained therein; and

(b) Appropriate hazard warnings.

(6) The employer may use signs, placards, process sheets, batch tickets, operating procedures, or other such written materials in lieu of affixing labels to individual stationary process containers, as long as the alternative method identifies the containers to which it is applicable and conveys the information required by subsection (5) of this section to be on a label. The written materials shall be readily accessible to the employees in their work area throughout each work shift.

(7) The employer is not required to label portable containers into which hazardous chemicals are transferred from labeled containers, and which are intended only for the immediate use of the employee who performs the transfer.

(8) The employer shall not remove or deface existing labels on incoming containers of hazardous chemicals, unless the container is immediately marked with the required information.

(9) The employer shall ensure that labels or other forms of warning are legible, in English, and prominently displayed on the container, or readily available in the work area throughout each work shift. Employers having employees who speak other languages may add the information in their language to the material presented, as long as the information is presented in English as well.

(10) The chemical manufacturer, importer, distributor or employer need not affix new labels to comply with this section if existing labels already convey the required information.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-62-05411, filed 7/6/88. Statutory Authority: RCW 49.17-.040 and 49.17.050. 85-10-004 (Order 85-09), § 296-62-05411, filed 4/19/85; 84-13-001 (Order 84-14), § 296-62-05411, filed 6/7/84.]

WAC 296-62-05413 Material safety data sheets.

(1) Chemical manufacturers and importers shall obtain or develop a material safety data sheet for each hazardous chemical they produce or import. Employers shall have a material safety data sheet for each hazardous chemical which they use.

(2) Each material safety data sheet shall be in English and shall contain at least the following information:

(a) The identity used on the label, and, except as provided for in WAC 296-62-05417 on trade secrets:

(i) If the hazardous chemical is a single substance, its chemical and common name(s);

(ii) If the hazardous chemical is a mixture which has been tested as a whole to determine its hazards, the chemical and common name(s) of the ingredients which contribute to these known hazards, and the common name(s) of the mixture itself; or,

(iii) If the hazardous chemical is a mixture which has not been tested as a whole:

(A) The chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise 1% or greater of the composition, except that chemicals identified as carcinogens under WAC 296-62-05407(4) shall be listed if the concentrations are 0.1% or greater; and,

(B) The chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise less than one percent (0.1% for carcinogens) of the mixture, if there is evidence that the ingredient(s) could be released from the mixture in concentrations which would exceed an established WISHA permissible exposure limit or ACGIH Threshold Limit Value, or could present a health hazard to employees; and,

(C) The chemical and common name(s) of all ingredients which have been determined to present a physical hazard when present in the mixture;

(b) Physical and chemical characteristics of the hazardous chemical (such as vapor pressure, flash point);

(c) The physical hazards of the hazardous chemical, including the potential for fire, explosion, and reactivity;

(d) The acute and chronic health hazards of the hazardous chemical, including signs and symptoms of exposure, and any medical conditions which are generally recognized as being aggravated by exposure to the chemical;

(e) The primary route(s) of entry;

(f) The WISHA permissible exposure limit, ACGIH threshold limit value, and any other exposure limit used or recommended by the chemical manufacturer, importer, or employer preparing the material safety data sheet, where available;

(g) Whether the hazardous chemical is listed in the National Toxicology Program (NTP) Annual Report on Carcinogens (latest edition) or has been found to be a potential carcinogen in the International Agency for Research on Cancer (IARC) Monographs (latest editions), or by WISHA;

(h) Any generally applicable precautions for safe handling and use which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for clean-up of spills and leaks;

(i) Any generally applicable control measures which are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, such as appropriate engineering controls, work practices, or personal protective equipment;

(j) Emergency and first aid procedures;

(k) The date of preparation of the material safety data sheet or the last change to it; and,

(l) The name, address and telephone number of the chemical manufacturer, importer, employer or other responsible party preparing or distributing the material safety data sheet, who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

(3) If no relevant information is found for any given category on the material safety data sheet, the chemical manufacturer, importer or employer preparing the material safety data sheet shall mark it to indicate that no applicable information was found.

(4) Where complex mixtures have similar hazards and contents (i.e. the chemical ingredients are essentially the same, but the specific composition varies from mixture to mixture), the chemical manufacturer, importer or employer may prepare one material safety data sheet to apply to all of these similar mixtures.

(5) The chemical manufacturer, importer or employer preparing the material safety data sheet shall ensure that the information recorded accurately reflects the scientific evidence used in making the hazard determination. If the chemical manufacturer, importer or employer becomes newly aware of any significant information regarding the hazards of a chemical, or ways to protect against the hazards, this new information shall be added to the material safety data sheet within three months. If the chemical is not currently being produced or imported the chemical manufacturer or importer shall add the information to the material safety data sheet before the chemical is introduced into the workplace again.

(6) Chemical manufacturers or importers shall ensure that distributors and employers are provided an appropriate material safety data sheet with their initial shipment, and with the first shipment after a material safety data sheet is updated. The chemical manufacturer or importer shall either provide material safety data sheets with the shipped containers or send them to the employer prior to or at the time of the shipment. If the material safety data sheet is not provided with a shipment that has been labeled as a hazardous chemical, the employer shall obtain one from the chemical manufacturer, importer, or distributor as soon as possible.

(7) Distributors shall ensure that material safety data sheets, and updated information, are provided to other distributors and employers. Retail distributors which sell hazardous chemicals to commercial customers shall provide a material safety data sheet to such employers upon request, and shall post a sign or otherwise inform them that a material safety data sheet is available. Chemical manufacturers, importers, and distributors need not provide material safety data sheets to retail distributors which have informed them that the retail distributor does not sell the product to commercial customers or open the sealed container to use it in their own workplaces.

(8) The employer shall maintain copies of the required material safety data sheets for each hazardous

chemical in the workplace, and shall ensure that they are readily accessible during each work shift to employees when they are in their work area(s).

(9) Where employees must travel between workplaces during a workshift, i.e., their work is carried out at more than one geographical location, the material safety data sheets may be kept at a central location at the primary workplace facility. In this situation, the employer shall ensure that employees can immediately obtain the required information in an emergency.

(10) Material safety data sheets may be kept in any form, including operating procedures, and may be designed to cover groups of hazardous chemicals in a work area where it may be more appropriate to address the hazards of a process rather than individual hazardous chemicals. However, the employer shall ensure that in all cases the required information is provided for each hazardous chemical, and is readily accessible during each work shift to employees when they are in their work area(s).

(11) Material safety data sheets shall also be made readily available, upon request, to designated representatives and to the director or his/her designee in accordance with the requirements of WAC 296-62-05209.

(12) If a purchaser has not received a material safety data sheet within thirty calendar days after making a written request to the chemical manufacturer, importer, or distributor in accordance with WAC 296-62-05413(6), he/she may make a written request for assistance to the Department of Labor and Industries, Right-to-Know Program, Industrial Hygiene Section, P.O. Box 207, Olympia, Washington 98504. Such written request shall include:

(a) A copy of the purchaser's written request to the chemical manufacturer, importer, or distributor;

(b) The name of the product suspected of containing a hazardous chemical;

(c) The identification number of the product if available;

(d) A copy of the product label if available; and

(e) The name and address of the chemical manufacturer, importer, or distributor from whom the product was obtained.

Upon receipt of a written request for material safety data sheet, the department shall attempt to procure the material safety data sheet from the chemical manufacturer, importer or distributor and upon procurement, shall forward a copy of the material safety data sheet at no cost to the purchaser.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-62-05413, filed 7/6/88. Statutory Authority: RCW 49.17-230, 49.70.180, 49.17.040, 49.17.050 and 49.17.240. 86-12-004 (Order 86-22), § 296-62-05413, filed 5/22/86. Statutory Authority: RCW 49.17.040 and 49.17.050. 85-10-004 (Order 85-09), § 296-62-05413, filed 4/19/85; 84-22-012 (Order 84-22), § 296-62-05413, filed 10/30/84; 84-13-001 (Order 84-14), § 296-62-05413, filed 6/7/84.]

WAC 296-62-05417 Trade secrets. (1) The chemical manufacturer, importer or employer may withhold the specific chemical identity including the chemical name and other specific identification of a hazardous

chemical, from the material safety data sheet, provided that:

(a) The claim that the information withheld is a trade secret can be supported;

(b) Information contained in the material safety data sheet concerning the properties and effects of the hazardous chemical is disclosed;

(c) The material safety data sheet indicates that the specific chemical identity is being withheld as a trade secret; and,

(d) The specific chemical identity is made available to health professionals, employees, and designated representatives, in accordance with the applicable provisions of this section.

(2) Where a treating physician or nurse determines that a medical emergency exists and the specific chemical identity of a hazardous chemical is necessary for emergency or first-aid treatment, the chemical manufacturer, importer, or employer shall immediately disclose the specific chemical identity of a trade secret chemical to that treating physician or nurse, regardless of the existence of a written statement of need or a confidentiality agreement. The chemical manufacturer, importer, or employer may require a written statement of need and confidentiality agreement, in accordance with the provisions of subsections (3) and (4) of this section, as soon as circumstances permit.

(3) In nonemergency situations, a chemical manufacturer, importer, or employer shall, upon request, disclose a specific chemical identity, otherwise permitted to be withheld under subsection (1) of this section, to a health professional (i.e. physician, registered nurse, industrial hygienist, toxicologist, or epidemiologist) providing medical or other occupational health services to exposed employee(s), and to employees or designated representatives, if:

(a) The request is in writing;

(b) The request describes with reasonable detail one or more of the following occupational health needs for the information:

(i) To assess the hazards of the chemicals to which employees will be exposed;

(ii) To conduct or assess sampling of the workplace atmosphere to determine employee exposure levels;

(iii) To conduct preassignment or periodic medical surveillance of exposed employees;

(iv) To provide medical treatment to exposed employees;

(v) To select or assess appropriate personal protective equipment for exposed employees;

(vi) To design or assess engineering controls or other protective measures for exposed employees; and,

(vii) To conduct studies to determine the health effects of exposure.

(c) The request explains in detail why the disclosure of the specific chemical identity is essential and that, in lieu thereof, the disclosure of the following information to the health professional, employee, or designated representatives, would not satisfy the purposes described in (b) of this subsection:

(i) The properties and effects of the chemical;

(ii) Measures for controlling workers' exposure to the chemical;

(iii) Methods of monitoring and analyzing worker exposure to the chemical; and,

(iv) Methods of diagnosing and treating harmful exposures to the chemical;

(d) The request includes a description of the procedures to be used to maintain the confidentiality of the disclosed information; and,

(e) The health professional, and the employer or contractor of the services of the health professional (i.e., downstream employer, labor organization, or individual employee), employee, or designated representative, agree in a written confidentiality agreement that the health professional employee, or designated representative, will not use the trade secret information for any purpose other than the health need(s) asserted and agree not to release the information under any circumstances other than to the department, as provided in subsection (6) of this section, except as authorized by the terms of the agreement or by the chemical manufacturer, importer, or employer.

(4) The confidentiality agreement authorized by subsection (3)(e) of this section:

(a) May restrict the use of the information to the health purposes indicated in the written statement of need;

(b) May provide for appropriate legal remedies in the event of a breach of the agreement, including stipulation of a reasonable preestimate of likely damages; and,

(c) May not include requirements for the posting of a penalty bond.

(5) Nothing in this section is meant to preclude the parties from pursuing noncontractual remedies to the extent permitted by law.

(6) If the health professional, employee, or designated representative receiving the trade secret information decides that there is a need to disclose it to the department, the chemical manufacturer, importer, or employer who provided the information shall be informed by the health professional, employee, or designated representative prior to, or at the same time as, such disclosure.

(7) If the chemical manufacturer, importer, or employer denies a written request for disclosure of a specific chemical identity, the denial must:

(a) Be provided to the health professional, employee, or designated representative, within thirty days of the request;

(b) Be in writing;

(c) Include evidence to support the claim that the specific chemical identity is a trade secret;

(d) State the specific reasons why the request is being denied; and,

(e) Explain in detail how alternative information may satisfy the specific medical or occupational health need without revealing the specific chemical identity.

(8) The health professional, employee, or designated representative, whose request for information is denied under subsection (3) of this section may refer the request and the written denial of the request to the department for consideration.

(9) When a health professional, employee, or designated representative refers the denial to the department under subsection (8) of this section, the director or his/her designee shall consider the evidence to determine if:

(a) The chemical manufacturer, importer, or employer has supported the claim that the specific chemical identity is a trade secret;

(b) The health professional, employee, or designated representative, has supported the claim that there is a medical or occupational health need for the information; and,

(c) The health professional, employee, or designated representative, has demonstrated adequate means to protect the confidentiality.

(10) If the director or his/her designee determines that the specific chemical identity requested under subsection (3) of this section is not a bona fide trade secret, or that it is a trade secret but the requesting health professional, employee, or designated representative has a legitimate medical or occupational health need for the information, has executed a written confidentiality agreement, and has shown adequate means to protect the confidentiality of the information, the chemical manufacturer, importer, or employer will be subject to citation by the department.

(11) If a chemical manufacturer, importer, or employer demonstrates to the department that the execution of a confidentiality agreement would not provide sufficient protection against the potential harm from the unauthorized disclosure of a trade secret specific chemical identity, the director or his/her designee may issue such orders or impose such additional limitations or conditions upon the disclosure of the requested chemical information as may be appropriate to assure that the occupational health services are provided without an undue risk of harm to the chemical manufacturer, importer, or employer.

(12) If, following the issuance of a citation and any protective orders, the chemical manufacturer, importer, or employer continues to withhold the information, further action may be taken by the department in accordance with chapter 49.17 RCW.

(13) Notwithstanding the existence of a trade secret claim, a chemical manufacturer, importer, or employer shall, upon request, disclose to the director or his/her designee any information which this section requires the chemical manufacturer, importer, or employer to make available. Where there is a trade secret claim, such claim shall be made no later than at the time the information is provided to the director or his/her designee so that suitable determinations of trade secret status can be made and the necessary protections can be implemented.

(14) Nothing in this section shall be construed as requiring the disclosure under any circumstances of process or percentage of mixture information which is trade secret.

RCW 49.17.040 and 49.17.050. 84-22-012 (Order 84-22), § 296-62-05417, filed 10/30/84; 84-13-001 (Order 84-14), § 296-62-05417, filed 6/7/84.]

WAC 296-62-05421 Appendix A--Health hazard definitions (mandatory). Although safety hazards related to the physical characteristics of a chemical can be objectively defined in terms of testing requirements (e.g., flammability), health hazard definitions are less precise and more subjective. Health hazards may cause measurable changes in the body—such as decreased pulmonary function. These changes are generally indicated by the occurrence of signs and symptoms in the exposed employees—such as shortness of breath, a nonmeasurable, subjective feeling. Employees exposed to such hazards must be apprised of both the change in body function and the signs and symptoms that may occur to signal that change.

The determination of occupational health hazards is complicated by the fact that many of the effects or signs and symptoms occur commonly in nonoccupationally exposed populations, so that effects of exposure are difficult to separate from normally occurring illnesses. Occasionally, a substance causes an effect that is rarely seen in the population at large, such as angiosarcomas caused by vinyl chloride exposure, thus making it easier to ascertain that the occupational exposure was the primary causative factor. More often, however, the effects are common, such as lung cancer. The situation is further complicated by the fact that most chemicals have not been adequately tested to determine their health hazard potential, and data do not exist to substantiate these effects.

There have been many attempts to categorize effects and to define them in various ways. Generally, the terms "acute" and "chronic" are used to delineate between effects on the basis of severity or duration. "Acute" effects usually occur rapidly as a result of short-term exposures, and are of short duration. "Chronic" effects generally occur as a result of long-term exposure, and are of long duration.

The acute effects referred to most frequently are those defined by the American National Standards Institute (ANSI) standard for Precautionary Labeling of Hazardous Industrial Chemicals (Z129.1-1982) — irritation, corrosivity, sensitization and lethal dose. Although these are important health effects, they do not adequately cover the considerable range of acute effects which may occur as a result of occupational exposure, such as, for example, narcosis.

Similarly, the term chronic effect is often used to cover only carcinogenicity, teratogenicity, and mutagenicity. These effects are obviously a concern in the workplace, but again, do not adequately cover the area of chronic effects, excluding, for example, blood dyscrasias (such as anemia), chronic bronchitis and liver atrophy.

The goal of defining precisely, in measurable terms, every possible health effect that may occur in the workplace as a result of chemical exposures cannot realistically be accomplished. This does not negate the need for

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-62-05417, filed 7/6/88. Statutory Authority: RCW 49.17-.230, 49.70.180, 49.17.040, 49.17.050 and 49.17.240. 86-12-004 (Order 86-22), § 296-62-05417, filed 5/22/86. Statutory Authority:

employees to be informed of such effects and protected from them.

Appendix B, which is also mandatory, outlines the principles and procedures of hazard assessment.

For purposes of this section, health hazards include but are not limited to any chemicals which meet any of the following definitions, as determined by the criteria set forth in Appendix B.

(1) Carcinogen. A chemical is considered to be a carcinogen if:

(a) It has been evaluated by the International Agency for Research on Cancer (IARC), and found to be a carcinogen or potential carcinogen; or

(b) It is listed as a carcinogen or potential carcinogen in the Annual Report on Carcinogens published by the National Toxicology Program (NTP) (latest edition); or,

(c) It is regulated by WISHA as a carcinogen.

(2) Corrosive. A chemical that causes visible destruction of, or irreversible alterations in, living tissue by chemical action at the site of contact. For example, a chemical is considered to be corrosive if, when tested on the intact skin of albino rabbits by the method described by the U.S. Department of Transportation in Appendix A to 49 CFR Part 173, it destroys or changes irreversibly the structure of the tissue at the site of contact following an exposure period of four hours. This term shall not refer to action on inanimate surfaces.

(3) Highly toxic. A chemical falling within any of the following categories:

(a) A chemical that has a median lethal dose (LD_{50}) of 50 milligrams or less per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.

(b) A chemical that has a median lethal dose (LD_{50}) of 200 milligrams or less per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.

(c) A chemical that has a median lethal concentration (LC_{50}) in air of 200 parts per million by volume or less of gas or vapor, or 2 milligrams per liter or less of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.

(4) Irritant. A chemical, which is not corrosive, but which causes a reversible inflammatory effect on living tissue by chemical action at the site of contact. A chemical is a skin irritant if, when tested on the intact skin of albino rabbits by the methods of 16 CFR 1500.41 for four hours exposure or by other appropriate techniques, it results in an empirical score of five or more. A chemical is an eye irritant if so determined under the procedure listed in 16 CFR 1500.42 or other appropriate techniques.

(5) Sensitizer. A chemical that causes a substantial proportion of exposed people or animals to develop an allergic reaction in normal tissue after repeated exposure to the chemical.

(6) Toxic. A chemical falling within any of the following categories:

(a) A chemical that has a median lethal dose (LD_{50}) of more than 50 milligrams per kilogram but not more than 500 milligrams per kilogram of body weight when administered orally to albino rats weighing between 200 and 300 grams each.

(b) A chemical that has a median lethal dose (LD_{50}) of more than 200 milligrams per kilogram but not more than 1,000 milligrams per kilogram of body weight when administered by continuous contact for 24 hours (or less if death occurs within 24 hours) with the bare skin of albino rabbits weighing between two and three kilograms each.

(c) A chemical that has a median lethal concentration (LC_{50}) in air of more than 200 parts per million but not more than 2,000 parts per million by volume of gas or vapor, or more than two milligrams per liter but not more than 20 milligrams per liter of mist, fume, or dust, when administered by continuous inhalation for one hour (or less if death occurs within one hour) to albino rats weighing between 200 and 300 grams each.

(7) Target organ effects. The following is a target organ categorization of effects which may occur, including examples of signs and symptoms and chemicals which have been found to cause such effects. These examples are presented to illustrate the range and diversity of effects and hazards found in the workplace, and the broad scope employers must consider in this area, but are not intended to be all-inclusive.

(a) Hepatotoxins:	Chemicals which produce liver damage.
Signs & symptoms:	Jaundice, liver enlargement
Chemicals:	Carbon tetrachloride, nitrosamines.
(b) Nephrotoxins:	Chemicals which produce kidney damage.
Signs & symptoms:	Edema; proteinuria
Chemicals:	Halogenated hydrocarbons; uranium.
(c) Neurotoxins:	Chemicals which produce their primary toxic effects on the nervous system.
Signs & symptoms:	Narcosis; behavioral changes; decrease in motor functions.
Chemicals:	Mercury, carbon disulfide.
(d) Agents which act on the blood or hematopoietic system:	Decrease hemoglobin function; deprive the body tissues of oxygen.
Signs & symptoms:	Cyanosis; loss of consciousness
Chemicals:	Carbon monoxide; cyanides.
(e) Agents which damage the lung:	Chemicals which irritate or damage the pulmonary tissue.
Signs & symptoms:	Cough; tightness in chest; shortness of breath.
Chemicals:	Silica; asbestos.
(f) Reproductive toxins:	Chemicals which affect the reproductive capabilities including chromosomal damage (mutations) and effects on fetuses (teratogenesis).
Signs & symptoms:	Birth defects; sterility
Chemicals:	Lead; DBCP.

- (g) Cutaneous hazards: Chemicals which affect the dermal layer of the body.
 Signs & symptoms: Defatting of the skin; rashes; irritation
 Chemicals: Ketones; chlorinated compounds.
- (h) Eye hazards: Chemicals which affect the eye or visual capacity.
 Signs & symptoms: Conjunctivitis; corneal damage.
 Chemicals: Organic solvents; acids.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-62-05421, filed 7/6/88. Statutory Authority: RCW 49.17-.040 and 49.17.050. 85-10-004 (Order 85-09), § 296-62-05421, filed 4/19/85; 84-22-012 (Order 84-22), § 296-62-05421, filed 10/30/84; 84-13-001 (Order 84-14), § 296-62-05421, filed 6/7/84.]

WAC 296-62-05423 Appendix B--Hazard determination (mandatory). The quality of a hazard communication program is largely dependent upon the adequacy and accuracy of the hazard determination. The hazard determination requirement of this standard is performance-oriented. Chemical manufacturers, importers, and employers evaluating chemicals are not required to follow any specific methods for determining hazards, but they must be able to demonstrate that they have adequately ascertained the hazards of the chemicals produced or imported in accordance with the criteria set forth in this appendix.

Hazard evaluation is a process which relies heavily on the professional judgment of the evaluator, particularly in the area of chronic hazards. The performance-orientation of the hazard determination does not diminish the duty of the chemical manufacturer, importer or employer to conduct a thorough evaluation, examining all relevant data and producing a scientifically defensible evaluation. For purposes of this standard, the following criteria shall be used in making hazard determinations that meet the requirements of this standard.

(1) Carcinogenicity. As described in WAC 296-62-05407(4) and Appendix A of this section, a determination by the National Toxicology Program, the International Agency for Research on Cancer, or WISHA that a chemical is a carcinogen or potential carcinogen will be considered conclusive evidence for purposes of this section.

(2) Human data. Where available, epidemiological studies and case reports of adverse health effects shall be considered in the evaluation.

(3) Animal data. Human evidence of health effects in exposed populations is generally not available for the majority of chemicals produced or used in the workplace. Therefore, the available results of toxicological testing in animal populations shall be used to predict the health effects that may be experienced by exposed workers. In particular, the definitions of certain acute hazards refer to specific animal testing results (see Appendix A).

(4) Adequacy and reporting of data. The results of any studies which are designed and conducted according to established scientific principles, and which report statistically significant conclusions regarding the health effects of a chemical, shall be a sufficient basis for a hazard determination and reported on any material safety data sheet.

The chemical manufacturer, importer, or employer may also report the results of other scientifically valid studies which tend to refute the findings of hazard.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-62-05423, filed 7/6/88. Statutory Authority: RCW 49.17-.040 and 49.17.050. 84-13-001 (Order 84-14), § 296-62-05423, filed 6/7/84.]

WAC 296-62-05425 Appendix C--Information sources (advisory). The following is a list of available data sources which the chemical manufacturer, importer, or employer may wish to consult to evaluate the hazards of chemicals they produce or import:

(1) Any information in their own company files such as toxicity testing results or illness experience of company employees.

(2) Any information obtained from the supplier of the chemical, such as material safety data sheets or product safety bulletins.

(3) Any pertinent information obtained from the following source list (latest editions should be used):

Condensed Chemical Dictionary

Van Nostrand Reinhold Co.
 135 West 50th Street
 New York, NY 10020

The Merck Index: An Encyclopedia of Chemicals and Drugs

Merck and Company, Inc.
 126 E. Lincoln Avenue
 Rahway, NJ 07065

IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man

Geneva: World Health Organization
 International Agency for Research on Cancer, 1972-1977
 Present (Multivolume work) Summaries are available in supplemental volumes.
 49 Sheridan Street
 Albany, New York

Industrial Hygiene and Toxicology, by F.A. Patty

John Wiley & Sons, Inc.
 New York, NY
 (Five volumes)

Clinical Toxicology of Commercial Products

Gleason, Gosselin and Hodge

Casarett and Doull's Toxicology; The Basic Science of Poisons

Doull, Klaassen, and Amdur
 Macmillan Publishing Co., Inc.
 New York, NY

Industrial Toxicology, by Alice Hamilton and Harriet L. Hardy

Publishing Sciences Group, Inc.
 Acton, MA

Toxicology of the Eye, by W. Morton Grant

Charles C. Thomas
 301-327 East Lawrence Avenue
 Springfield, IL

Recognition of Health Hazards in Industry

William A. Burgess
 John Wiley and Sons
 605 Third Avenue
 New York, NY 10158

Chemical Hazards of the Workplace

Nick H. Proctor and James P. Hughes
 J.P. Lipincott Company
 6 Winchester Terrace
 New York, NY 10022

Handbook of Chemistry and Physics

Chemical Rubber Company
18901 Cranwood Parkway
Cleveland, OH 44128

Threshold Limit Values for Chemical Substances and Physical Agents in the Work Environment and Biological Exposure Indices with Intended Changes

American Conference of Governmental Industrial Hygienists
6500 Glenway Avenue, Bldg. D-5
Cincinnati, OH 45211

Note: Information on the physical hazards of chemicals may be found in publication's of the National Fire Protection Association, Boston, MA.

National Toxicology Program (NTP) Annual Report on Carcinogens (Latest Edition)

National Technical Information Service (NTIS)
5285 Port Royal Road
Springfield, VA 22101

Note: The following documents may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

Occupational Health Guidelines

NIOSH/OSHA (NIOSH Pub. No. 81-123)

NIOSH Pocket Guide to Chemical Hazards

NIOSH Pub. No. 85-14

Registry of Toxic Effects of Chemical Substances

NIOSH Pub. No. 80-102 Miscellaneous Documents published by the National Institute for Occupational Safety and Health

- (1) Criteria documents
- (2) Special Hazard Reviews
- (3) Occupational Hazard Assessment
- (4) Current Intelligence Bulletins
- (5) WISHA's Occupational Health standards—Safety standards for carcinogens, chapter 296-62 WAC - Part F—Carcinogens.

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Service Provider	File Name
Bibliographic Retrieval Services (BRS), 1200 Route 7, Latham, NY 12110.	Biosis Previews CA Search Medlars NTIS Hazardline American Chemical Society Journal Excerpta Medica IRCS Medical Science Journal Pre-Med Intl. Pharmaceutical Abstracts Paper Chem
Lockheed - DIALOG Information Service, Inc., 3460 Hill View Avenue, Palo Alto, CA 94304.	Biosis Prev. Files CA Search Files CAB Abstracts Chemical Exposure Chemname Chemsis Files Chemzero Embase Files Environmental Bibliographies Enviroline Federal Research in Progress IRL Life Science Collection NTIS

Service Provider

File Name

SDC - Orbit, SDC
Information Service,
2500 Colorado Avenue,
Santa Monica, CA 90406.

National Library of Medicine,
Department of Health and
Human Services, Public
Health Service, National
Institutes of Health,
Bethesda, MD 20209.

Pergamon International
Information Corp.,
1340 Old Chain Bridge, Rd.,
McLean, VA 22101.

Questel, Inc.,
1625 Eye Street, NW,
Suite 818,
Washington, DC 20006.

Chemical Information System
ICI (ICIS), Bureau of
National Affairs,
1133 15th Street, NW,
Suite 300,
Washington, DC 20005.

Occupational Health
Services,
400 Plaza Drive,
Secaucus, NJ 07094.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-62-05425, filed 7/6/88. Statutory Authority: RCW 49.17-.230, 49.70.180, 49.17.040, 49.17.050 and 49.17.240. 86-12-004 (Order 86-22), § 296-62-05425, filed 5/22/86. Statutory Authority: RCW 49.17.040 and 49.17.050. 85-10-004 (Order 85-09), § 296-62-05425, filed 4/19/85; 84-13-001 (Order 84-14), § 296-62-05425, filed 6/7/84.]

WAC 296-62-05427 Appendix D. Definition of "trade secret" (mandatory)

The following is a reprint of the *Restatement of Torts* section 757, comment b (1939):

"b. *Definition of trade secret.* A trade secret may consist of any formula, pattern, device or compilation of information which is used in one's business, and which gives him an opportunity to obtain an advantage over competitors who do not know or use it. It may be a formula for a chemical compound, a process of manufacturing, treating or preserving materials, a pattern for a machine or other device, or a list of customers. It differs from other secret information in a business (see § 759 of the *Restatement of Torts* which is not included in this Appendix) in that it is not simply information as to single or ephemeral events in the conduct of the business, as, for example, the amount or other terms of a secret bid for a contract or the salary of certain employees, or the security investments made or contemplated, or the date fixed for the announcement of a new policy or for bringing out a new model or the like. A trade secret is a

process or device for continuous use in the operations of the business. Generally it relates to the production of goods, as, for example, a machine or formula for the production of an article. It may, however, relate to the sale of goods or to other operations in the business, such as a code for determining discounts, rebates or other concessions in a price list or catalogue, or a list of specialized customers, or a method of bookkeeping or other office management.

Secrecy. The subject matter of a trade secret must be secret. Matters of public knowledge or of general knowledge in an industry cannot be appropriated by one as his secret. Matters which are completely disclosed by the goods which one markets cannot be his secret. Substantially, a trade secret is known only in the particular business in which it is used. It is not requisite that only the proprietor of the business know it. He may, without losing his protection, communicate it to employees involved in its use. He may likewise communicate it to other pledged to secrecy. Others may also know of it independently, as, for example, when they have discovered the process or formula by independent invention and are keeping it secret. Nevertheless, a substantial element of secrecy must exist, so that, except by the use of improper means, there would be difficulty in acquiring the information. An exact definition of a trade secret is not possible. Some factors to be considered in determining whether given information is one's trade secret are: (1) The extent to which the information is known outside of his business; (2) the extent to which it is known by employees and others involved in his business; (3) the extent of measures taken by him to guard the secrecy of the information; (4) the value of the information to him and his competitors; (5) the amount of effort or money expended by him in developing the information; (6) the ease or difficulty with which the information could be properly acquired or duplicated by others.

Novelty and prior art. A trade secret may be a device or process which is patentable; but it need not be that. It may be a device or process which is clearly anticipated in the prior art or one which is merely a mechanical improvement that a good mechanic can make. Novelty and invention are not requisite for a trade secret as they are for patentability. These requirements are essential to patentability because a patent protects against unlicensed use of the patented device or process even by one who discovers it properly through independent research. The patent monopoly is a reward to the inventor. But such is not the case with a trade secret. Its protection is not based on a policy of rewarding or otherwise encouraging the development of secret processes or devices. The protection is merely against breach of faith and reprehensible means of learning another's secret. For this limited protection it is not appropriate to require also the kind of novelty and invention which is a requisite of patentability. The nature of the secret is, however, an important factor in determining the kind of relief that is appropriate against one who is subject to liability under the rule stated in this Section. Thus, if the secret consists of a device or process which is a novel

invention, one who acquires the secret wrongfully is ordinarily enjoined from further use of it and is required to account for the profits derived from his past use. If, on the other hand, the secret consists of mechanical improvements that a good mechanic can make without resort to the secret, the wrongdoer's liability may be limited to damages, and an injunction against future use of the improvements made with the aid of the secret may be inappropriate.

[Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-05427, filed 4/27/87. Statutory Authority: RCW 49.17.230, 49.70.180, 49.17.040, 49.17.050 and 49.17.240. 86-12-004 (Order 86-22), § 296-62-05427, filed 5/22/86.]

PART E--RESPIRATORY PROTECTION

WAC 296-62-07113 Selection of respirators. (1)

General considerations. Proper selection of respirators shall be made in accordance with the classification, capabilities, and limitations listed in tables I through IV of this section. Additional guidance may be obtained by referring to American National Standard Practices for Respiratory Protection Z88.2 - 1980.

(2) Respirator protection factor (PF). Respirators shall be selected according to the characteristics of the hazards involved, the capabilities and limitations of the respirators, and the ability of each respirator wearer to obtain a satisfactory fit with a respirator. Taking into account the capabilities and limitations of respirators and the results of respirator-fitting tests, a table of respirator protection factors has been prepared (see Table V). A respirator protection factor is a measure of the degree of protection provided by a respirator to a wearer. Multiplying either (a) the permissible time-weighted average concentration or the permissible ceiling concentration, whichever is applicable, for a toxic substance, or (b) the maximum permissible airborne concentration for a radionuclide by a protection factor assigned to a respirator gives the maximum concentration of the hazardous substance in which the respirator can be used. Limitations of filters, cartridges, and canisters also shall be considered (see Table V).

(3) Respirator-fitting tests. A qualitative or quantitative respirator-fitting test shall be used to determine the ability of each individual respirator wearer to obtain a satisfactory fit with a negative-pressure respirator. The results of qualitative or quantitative respirator fitting-tests shall be used to select specific types, makes, and models of negative-pressure respirators for use by individual respirator wearers. A respirator-fitting test shall be carried out for each wearer of a negative-pressure respirator equipped with a facepiece. Respirator-fitting tests shall not be required for positive-pressure respirators or for mouthpiece respirators.

(a) Qualitative respirator-fitting test - A person wearing a respirator is exposed to an irritant smoke, an odorous vapor, or other suitable test agent. An air-purifying respirator must be equipped with an air-purifying element(s) which effectively removes the test agent from inspired air. If the respirator wearer is unable to detect penetration of the test agent into the respirator,

the respirator wearer has achieved a satisfactory fit with the respirator.

(b) Quantitative respirator-fitting test - A person wears a respirator in a test atmosphere containing a test agent in the form of an aerosol, vapor, or gas. Instrumentation, which samples the test atmosphere and the air inside the respiratory-inlet covering of the respirator, is used to measure quantitatively the penetration of the test agent into the respiratory-inlet covering.

(c) When carrying out a qualitative or quantitative respirator-fitting test, the respirator wearer shall carry out a series of exercises which simulate work movements.

(d) When carrying out respirator-fitting tests, it shall be an acceptable procedure to make the following modifications to respirators provided that such modifications do not affect the seal of the respirators to wearers.

(i) When carrying out a qualitative or quantitative respirator-fitting test which uses an aerosol as the test agent, it shall be acceptable procedure to equip an air-purifying respirator with a high-efficiency filter.

(ii) When carrying out a qualitative or quantitative respirator-fitting test which uses a vapor or gas as the test agent, it shall be acceptable procedure to equip an air-purifying respirator with an appropriate cartridge or canister which removes the vapor or gas from air.

(iii) When carrying out a quantitative respirator-fitting test, it shall be acceptable procedure to attach a sampling probe to the respirator which is connected by flexible tubing to an instrument which measures the penetration of the test agent into the respirator.

(e) If a qualitative respirator-fitting test has been used in respirator selection, a person shall be allowed to use only the specific make(s) and model(s) of respirator(s) for which the person obtained a satisfactory fit, and the respirator protection factor listed under

"qualitative test" in Table V shall apply. Under no circumstances shall a person be allowed to use any respirator for which the results of the qualitative respirator fitting test indicate that the person is unable to obtain a satisfactory fit.

(f) If a quantitative respirator-fitting test has been used in selecting a respirator, the test results shall be used to assign a respirator protection factor to each person for each specific make and model of respirator tested. The assigned respirator protection factor shall be applied when the person wears the specific respirator in a hazardous atmosphere, but it shall not exceed the respirator protection factor listed under "quantitative test" in table V for the particular type of respirator.

(4) Respirator-fitting test records. Records of respirator-fitting tests shall be kept for at least the duration of employment. These records shall include the following information:

(a) Type of respirator-fitting test used;

(b) Specific make and model of respirator tested;

(c) Name of person tested;

(d) Name of test operator;

(e) Date of test;

(f) Results of respirator-fitting tests;

(i) Success or failure of person to obtain satisfactory fit if a qualitative respirator-fitting test was carried out.

(ii) Respirator protection factor based upon test results if a quantitative respirator-fitting test was carried out.

(5) Face dimensions and facepiece sizes. The wide range of face dimensions may require more than a single size of respirator facepiece to provide a proper fit to all respirator users. Therefore, respirator facepieces of more than one size should be available in any respirator-selection program involving respirators equipped with facepieces.

Table 1
Classification of Respiratory Hazards According to Their Biological Effect

Oxygen Deficiency	Gas and Vapor Contaminants	Particulate Contaminants (Dust, fog, fume, mist, smoke, and spray)
<p>Minimum legal requirements: 18.0% by volume for respirable air at sea-level conditions. (See Note 1.)</p> <p>Occurrence: Confined or unventilated cellars, wells, mines, ship holds, tanks, burning buildings, and enclosures containing inert atmospheres.</p> <p>Atmospheric oxygen content (percent by volume) versus expected conditions:</p> <p>20.9%: Oxygen content of normal air at sea-level conditions.</p> <p>Oxygen Volume Percent at Sea Level</p> <p>Physiological Effects</p>	<p>Asphyxiants: Interfere with utilization of oxygen in the body.</p> <p>Simple asphyxiants: Physiologically inert substances that dilute oxygen in the air (for example: nitrogen, hydrogen, helium, methane). See Oxygen Deficiency, Column 1.</p> <p>Chemical asphyxiants: Low concentrations interfere with supply or utilization of oxygen in the body (for example: carbon monoxide, hydrogen cyanide, cyanogen, and nitriles).</p> <p>Irritants: Corrosive in action. May cause irritation and inflammation of parts of the respiratory system (also skin and eyes) and pulmonary edema (for example: ammonia hydrogen chloride, formaldehyde, sulfur dioxide, chlorine, ozone, nitrogen dioxide, phosgene, and arsenic trichloride).</p> <p>Anesthetics: Causes loss of feeling and sensation with unconsciousness and death possible (for example: nitrous oxide, hydrocarbons, and ethers). Some anesthetics injure body organs (for example: carbon tetrachloride [liver and kidneys], chloroform [liver and heart], benzene [bone marrow], and carbon disulfide [nervous system]).</p> <p>Sensitizers: Cause increased probability of physiological reactions (for example: isocyanates, epoxy resin systems).</p> <p>Systemic poisons: Damage organs and systems in the body (for example: mercury [nervous system and various organs], phosphorus [bone], hydrogen sulfide [respiratory paralysis], and arsine [red blood cells and liver]).</p> <p>Carcinogens: produce cancer in some individuals after a latent period (for example: vinyl chloride, benzene).</p>	<p>Relatively inert: May cause discomfort and minor irritation, but generally without injury at reasonable concentrations (for example: marble, gypsum).</p> <p>Pulmonary-fibrosis-producing: produce nodulation and fibrosis in the lung, possibly leading to complications (for example: quartz, asbestos).</p> <p>Carcinogens: Produce cancer in some individuals after latent period (for example: asbestos, chromates, radioactive particulates).</p> <p>Chemical irritants: Produce irritation, inflammation, and ulceration in the upper respiratory tract (for example: acidic mists, alkalies).</p> <p>Systemic poisons: Produce pathologic reactions in various systems of the body (for example: lead, manganese, cadmium).</p> <p>Allergy-producing: Produce reactions such as itching, sneezing, and asthmas (for example: pollens, spices, and animal fur).</p> <p>Febrile-reaction-producing: Produce chills followed by fever (for example: fumes of zinc and copper).</p>
<p>Combination of Gas, Vapor, and Particulate Contaminants</p> <p>Combinations of contaminants may occur simultaneously in the atmosphere. Contaminants may be entire different substances (dusts and gases from blasting) or the particulate and vapor forms of the same substance. Synergistic effects (joint action of two or more agents that results in an effect which greater than the sum of their individual effects) may occur. Such effects may require extraordinary protective measures.</p>		

NOTE 1: See definition in WAC 296-62-07105 for "oxygen deficiency - not immediately dangerous to life or health" and "oxygen deficiency - immediately dangerous to life or health."

Table 2
Classification of Respiratory Hazards According to Their Properties Which Influence Respirator Selection

Gas and Vapor Contaminants	Particulate Contaminants
<p>Inert: Substances that do not react with other substances under most conditions, but create a respiratory hazard by displacing air and producing oxygen deficiency (for example: helium, neon, argon).</p>	<p>Particles are produced by mechanical means by disintegration processes such as grinding, crushing, drilling, blasting, and spraying; or by physiochemical reactions such as combustion, vaporization, distillation, sublimation, calcination, and condensation. Particles are classified as follows:</p>
<p>Acidic: Substances that are acids or that react with water to produce an acid. In water, they produce positively charged hydrogen ions (H^{+1}) and a pH of less than 7. They taste sour, and many are corrosive to tissues (for example: hydrogen chloride, sulfur dioxide, fluorine, nitrogen dioxide, acetic acid, carbon dioxide, hydrogen sulfide, and hydrogen cyanide).</p>	<p>Dust: A solid, mechanically produced particle with sizes varying from submicroscopic to visible or macroscopic.</p>
<p>Alkaline: Substances that are alkalis or that react with water to produce an alkali. In water, they result in the production of negatively charged hydroxyl ions (OH^{-1}) and a pH greater than 7. They taste bitter, and many are corrosive to tissues (for example: ammonia, amines, phosphine, arsine, and stibine).</p>	<p>Spray: A liquid, mechanically produced particle with sizes generally in the visible or macroscopic range.</p>
<p>Organic: The components of carbon. Examples are saturated hydrocarbons (methane, ethane, butane) unsaturated hydrocarbons (ethylene, acetylene) alcohols (methyl ether, ethyl ether) aldehydes (formaldehyde), ketones (methyl ketone), organic acids (formic acid, acetic acid), halides (chloroform, carbon tetrachloride), amides (formamide, acetamide), nitriles (acetonitrile), isocyanates (toluene diisocyanate), amines (methylamine), epoxies (epoxyethane, propylene oxide), and aromatics (benzene, toluene, xylene).</p>	<p>Fume: A solid condensation particle of extremely small particle size, generally less than one micrometer in diameter.</p>
<p>Organometallic: Compounds in which metals are chemically bonded to organic groups (for example: ethyl silicate, tetraethyl lead, and organic phosphate).</p>	<p>Mist: A liquid condensation particle with sizes ranging from submicroscopic to visible or macroscopic.</p>
<p>Hydrides: Compounds in which hydrogen is chemically bonded to metals and certain other elements (for example: diborane and tetraborane).</p>	<p>Fog: A mist of sufficient concentration to perceptibly obscure vision.</p>
	<p>Smoke: A system which includes the products of combustion, pyrolysis, or chemical reaction of substances in the form of visible and invisible solid and liquid particles and gaseous products in air. Smoke is usually of sufficient concentration to perceptibly obscure vision.</p>

Table 3
Classification and Description of Respirators by Mode of Operation

Air-Supplying Respirators	Air-Purifying Respirators
<p>Respirable atmosphere independent of the ambient air is supplied to the wearer.</p>	<p>Ambient air, prior to being inhaled, is passed through a filter, cartridge, or canister which removes particles, vapors, gases, or a combination of these contaminants. The breathing action of the wearer operates the nonpowered type of respirator. The powered type contains a blower - stationary or carried by the wearer - which passes ambient air through an air-purifying component and then supplies purified air to the respirator-inlet covering. The nonpowered type is equipped with a facepiece or mouthpiece and nose clamp. The powered type is equipped with a facepiece, helmet, hood, or suit.</p>
<p>Self-Contained Breathing Apparatus (SCBA) A supply of air, oxygen, or oxygen-generated material is carried by the wearer. Normally equipped with full facepiece, but may be equipped with a quarter-mask facepiece, half-mask facepiece, helmet, hood or mouthpiece and nose clamp.</p>	<p>Vapor-and Gas-Removing Respirators Equipped with cartridge(s) or canister(s) to remove a single vapor or gas (for example: chlorine gas), a single class of vapors or gases (for example: organic vapors), or a combination of two or more classes of vapors or gases (for example: organic vapors and acidic gases) from air.</p>
<p>(1) Closed-Circuit SCBA (oxygen only, negative pressure^a or positive pressure^b).</p>	<p>Particulate-Removing Respirators Equipped with filter(s) to remove a single type of particulate matter (for example: dust) or a combination of two or more types of particulate matter (for example: dust and fume) from air. Filter may be a replaceable part or a permanent part of the respirator. Filter may be of the single-use or the reusable type.</p>
<p>(a) Compressed liquid oxygen type. Equipped with a facepiece or mouthpiece and nose clamp. High-pressure oxygen from a gas cylinder passes through a high-pressure reducing valve, and in some designs, through a low-pressure admission valve to a breathing bag or container. Liquid oxygen is converted to low-pressure gaseous oxygen and delivered to the breathing bag. The wearer inhales from the bag, through a corrugated tube connected to a mouthpiece or facepiece and a one-way check valve. Exhaled air passes through another check valve and tube into a container of carbon-dioxide removing chemical and reenters the breathing bag. Make-up oxygen enters the bag continuously or as the bag deflates sufficiently to actuate an admission valve. A pressure-relief system is provided, and a manual bypass and saliva trap may be provided depending upon the design.</p>	<p>Combination Particulate-and Vapor-and Gas-Removing Respirators Equipped with cartridge(s) or canister(s) to remove particulate matter, vapors and gases from air. The filter may be a permanent part or a replaceable part of a cartridge or canister.</p>
<p>(b) Oxygen-generating type. Equipped with a facepiece or mouthpiece and nose clamp. Water vapor in the exhaled breath reacts with chemical in the canister to release oxygen to the breathing bag. The wearer inhales from the bag through a corrugated tube and one-way check valve at the facepiece.</p>	<p>Supplied-Air Respirators (1) Hose Mask Equipped with a facepiece, breathing tube, rugged safety harness, and large-diameter heavy-duty non-kinking air-supply hose. The breathing tube and air-supply hose are securely attached to the harness. The facepiece is equipped with an exhalation valve. The harness has provision for attaching a safety line. (a) Hose mask with blower. Air is supplied by a motor-driven or hand-operated blower. The wearer can continue to inhale through the hose if the blower fails. Up to 300 feet (91 meters) of hose length is permissible. (b) Hose mask without blower. The wearer provides motivating force to pull air through the hose. The hose inlet is anchored and fitted with a funnel or like object covered with a fine mesh screen to prevent entrance of coarse particulate matter. Up to 75 feet (23 meters) of hose length is permissible.</p>
	<p>(2) Air-Line Respirator Respirable air is supplied through a small-diameter hose from a compressor or compressed-air cylinder(s). The hose is attached to the wearer by a belt or other suitable means and can be detached rapidly in an emergency. A flow-control valve or orifice is provided to govern the rate of air flow to the wearer. Exhaled air passes to the ambient atmosphere through a valve(s) or opening(s) in the enclosure (facepiece, helmet, hood, or suit). Up to 300 feet (91 meters) of hose length is permissible.</p>

Continued

Table 3
Classification and Description of Respirators by Mode of Operation (Continued)

Atmosphere-Supplying Respirators	Air-Purifying Respirators
<p>Self-Contained Breathing Apparatus (SCBA) (Continued) Exhaled air passes through a second check valve/breathing tube assembly into the canister. The oxygen-release rate is governed by the volume of exhaled air. Carbon dioxide in the exhaled breath is removed by the canister filter.</p> <p>(2) Open-Circuit (SCBA) (compressed air, compressed oxygen, liquid air, liquid oxygen). A bypass system is provided in case of regulator failure except on escape-type units.</p> <p>(a) Demand-type.^c Equipped with a facepiece or mouthpiece and nose clamp. The demand valve permits oxygen or air flow only during inhalation. Exhaled breath passes to ambient atmosphere through a valve(s) in the facepiece.</p> <p>(b) Pressure-demand type.^d Equipped with a facepiece only. Positive pressure is maintained in the facepiece. The apparatus may have provision for the wearer to select the demand or pressure-demand mode of operation, in which case the demand mode should be used only when donning or removing the apparatus.</p>	<p>Supplied-Air Respirators (Continued)</p> <p>(a) Continuous-flow class. Equipped with a facepiece, hood, helmet, or suit. At least 115 liters (four cubic feet) of air per minute to tight-fitting facepieces and 170 liters (six cubic feet) of air per minute to loose fitting helmets, hoods and suits is required. Air is supplied to a suit through a system of internal tubes to the head, trunk and extremities through valves located in appropriate parts of the suit.</p> <p>(b) Demand type.^c Equipped with a facepiece only. The demand valve permits flow of air only during inhalation.</p> <p>(c) Pressure-demand type.^d Equipped with a facepiece only. A positive pressure is maintained in the facepiece.</p>
<p>Combination Air-Line Respirators with Auxiliary Self-Contained Air Supply Includes an air-line respirator with an auxiliary self-contained air supply. To escape from a hazardous atmosphere in the event the primary air supply fails to operate, the wearer switches to the auxiliary self-contained air supply. Devices approved for both entry into and escape from dangerous atmospheres have a low-pressure warning alarm and contain at least a 15-minute self-contained air supply.</p>	
<p>Combination Atmosphere-Supplying and Air-Purifying Respirators</p>	
<p>Provide the wearer with the option of using either of two different modes of operation: (1) an atmosphere-supplying respirator with an auxiliary air-purifying attachment which provides protection in the event the air supply fails or (2) an air-purifying respirator with an auxiliary self-contained air supply which is used when the atmosphere may exceed safe conditions for use of an air-purifying respirator.</p>	
<p>^aDevice produces negative pressure in respiratory-inlet covering during inhalation.</p>	
<p>^bDevice produces positive pressure in respiratory-inlet covering during both inhalation and exhalation.</p>	
<p>^cEquipped with a demand valve that is activated on initiation of inhalation and permits the flow of breathing atmosphere to the facepiece. On exhalation, pressure in the facepiece becomes positive and the demand valve is deactivated.</p>	
<p>^dA positive pressure is maintained in the facepiece by a spring-loaded or balanced regulator and exhalation valve.</p>	

Table 4
Capabilities and Limitations of Respirators

Atmosphere-Supplying Respirators		Air-Purifying Respirators	
<p>(See WAC 296-62-07111 for specifications on respirable atmospheres.) Atmospheric-supplying respirators provide protection against oxygen deficiency and toxic atmospheres. The breathing atmosphere is independent of ambient atmospheric conditions.</p> <p>General Limitations: Except for some air-line suits, no protection is provided against skin irritation by materials such as ammonia and hydrogen chloride, or against sorption of materials such as hydrogen cyanide, trichloro, or organic phosphate pesticides through the skin. Facepieces present special problems to individuals required to wear prescription lenses. Use of atmosphere-supplying respirators in atmospheres immediately dangerous to life or health is limited to specific devices under specified conditions (see Table 5.)</p>		<p>General Limitations: Air-purifying respirators do not protect against oxygen-deficient atmospheres nor against skin irritation by, or sorption through the skin of, airborne contaminants.</p> <p>The maximum contaminant concentration against which an air-purifying respirator will protect is determined by the design efficiency and capacity of the cartridge, canister, or filter and the facepiece-to-face seal on the user. For gases and vapors, the maximum concentration for which the air-purifying element is designed is specified by the manufacturer or is listed on labels of cartridges and canisters.</p> <p>Nonpowered air-purifying respirators will not provide the maximum design protection specified unless the facepiece or mouthpiece/nose clamp is carefully fitted to the wearer's face to prevent inward leakage (WAC 296-62-07115(4)). The time period over which protection is provided is dependent on canister, cartridge, or filter type; concentration of contaminant; humidity levels in the ambient atmosphere; and the wearer's respiratory rate.</p> <p>The proper type of canister, cartridge, or filter must be selected for the particular atmosphere and conditions. Nonpowered air-purifying respirators may cause discomfort due to a noticeable resistance to inhalation. This problem is minimized in powered respirators. Respirator facepieces present special problems to individuals required to wear prescription lenses. These devices do have the advantage of being small, light, and simple in operation.</p> <p>Use of air-purifying respirators in atmospheres immediately dangerous to life or health is limited to specific devices under specified conditions (See Table 5).</p>	
<p>Self-Contained Breathing Apparatus (SCBA)</p> <p>The wearer carries his own breathing atmosphere.</p> <p>Limitations: The period over which the device will provide protection is limited by the amount of air or oxygen in the apparatus, the ambient atmospheric pressure (service life of open-circuit devices is cut in half by a doubling of the atmospheric pressure), and the type of work being performed. Some SCBA devices have a short service life (less than 15 minutes) and are suitable only for escape (self-rescue) from an irrespirable atmosphere.</p> <p>Chief limitations of SCBA devices are their weight or bulk, or both, limited service life, and the training required for their maintenance and safe use.</p> <p>(1) Closed-Circuit SCBA The closed-circuit operation conserves oxygen and permits longer service life at reduced weight.</p>	<p>Supplied-Air Respirators</p> <p>The respirable air supply is not limited to the quantity the individual can carry, and the devices are lightweight and simple.</p> <p>Limitations: Limited to use in atmospheres from which the wearer can escape unharmed without the aid of the respirator.</p> <p>The wearer is restricted in movement by the hose and must return to a respirable atmosphere by retracing his route of entry. The hose is subject to being severed or pinched off.</p> <p>(1) Hose Mask. The hose (inlet or blower must be located and secured in a respirable atmosphere. (a) Hose mask with blower. If the blower fails, the unit still provides protection, although a negative pressure exists in the facepiece during inhalation. (b) Hose mask without blower. Maximum hose length may restrict application of device.</p>	<p>Vapor and Gas-Removing Respirators</p> <p>Limitations: No protection is provided against particulate contaminants. A rise in canister or cartridge temperature indicates that a gas or vapor is being removed from the inspired air.</p> <p>An uncomfortably high temperature indicates a high concentration of gas or vapor and requires an immediate return to fresh air.</p>	<p>Particulate-Removing Respirators</p> <p>Limitations: Protection against non-volatile particles only. No protection against gases and vapors.</p> <p>Not for use in atmospheres immediately dangerous to life or health unless the device is a powered-type respirator with escape provisions (see Table 5).</p>

Continued

Table 4
Capabilities and Limitations of Respirators (Continued)

Atmosphere-Supplying Respirators		Air-Purifying Respirators	
Self-Contained Breathing Apparatus (Cont.)	Supplied-Air Respirators (Cont.)	Vapor and Gas-Removing Respirators (Cont.)	Particulate-Removing Respirators (Cont.)
<p>The negative-pressure type produces a negative pressure in the respiratory-inlet covering during inhalation, and this may permit inward leakage of contaminants; whereas the positive-pressure type always maintains a positive pressure in the respiratory-inlet covering and is less apt to permit inward leakage of contaminants.</p> <p>(2) Open Circuit SCBA. The demand type produces a negative pressure in the respiratory-inlet covering during inhalation, whereas the pressure-demand type maintains a positive pressure in the respiratory-inlet covering during inhalation and is less apt to permit inward leakage of contaminants.</p>	<p>(2) Air-Line Respirator (Continuous Flow, Demand and Pressure-Demand Types). The demand type produces a negative pressure in the facepiece on inhalation, whereas continuous-flow and pressure-demand types maintain a positive pressure in the respiratory-inlet covering and are less apt to permit inward leakage of contaminants.</p> <p>Air-line suits may protect against atmospheres that irritate the skin or that may be absorbed through the unbroken skin.</p> <p>Limitations: Air-line respirators provide no protection if the air supply fails. Some contaminants, such as tritium, may penetrate the material of an air-line suit and limit its effectiveness.</p> <p>Other contaminants, such as fluorine, may react chemically with the material of an air-line suit and damage it.</p>	<p>Use should be avoided in atmospheres where the contaminant(s) lack sufficient warning properties (that is, odor, taste, or irritation at a concentration in air at or above the permissible exposure limit). (Vapor- and gas-removing respirators are not approved for contaminants that lack adequate warning properties.</p> <p>Not for use in atmospheres immediately dangerous to life or health unless the device is a powered-type respirator with escape provisions (see Table 5).</p> <p>(1) Full Facepiece Respirator. Provides protection against eye irritation in addition to respiratory protection.</p> <p>(2) Quarter-Mask and Half-Mask Facepiece Respirator. A fabric covering (facelet) available from some manufacturers shall not be used.</p> <p>(3) Mouthpiece Respirator. Shall be used only for escape application. Mouth breathing prevents detection of contaminant by odor. Nose clamp must be securely in place to prevent prevent nasal breathing.</p> <p>A small lightweight device that can be donned quickly.</p>	<p>(1) Full Facepiece Respirator. Provides protection against eye irritation in addition to respiratory protection.</p> <p>(2) Quarter-Mask and Half-Mask Facepiece Respirator. A fabric covering (facelet) available from some manufacturers shall not be used unless approved for use with respirator.</p> <p>(3) Mouthpiece Respirator. Mouth breathing prevents detection of contaminant by odor. Nose clamp must be securely in place to prevent nasal breathing.</p> <p>A small, lightweight device that can be donned quickly.</p>
<p>Combination Airline Respirators with Auxiliary SC Air Supply</p> <p>The auxiliary self-contained air supply on this type of device allows the wearer to escape from a dangerous atmosphere. This device with auxiliary self-contained air supply is approved for escape and may be used for entry when it contains at least 15-minute auxiliary self-contained air supply. (See Table 5).</p>			
<p>Combination Particulate-and-Vapor-and Gas-Removing Respirators</p> <p>The advantages and disadvantages of the component sections of the combination respirator as described above apply.</p>			
<p>Combination Atmosphere-Supplying and Air-Purifying Respirators</p> <p>The advantages and disadvantages, expressed above, of the mode of operation being used will govern. The mode with the greater limitations (air-purifying mode) will mainly determine the overall capabilities and limitations of the respirator, since the wearer may for some reason fail to change the mode of operation even though conditions would require such a change.</p>			

Table 5
RESPIRATOR PROTECTION FACTORS^a

Type of Respirator	Permitted for Use in Oxygen-Deficient Atmosphere	Permitted for Use in Immediately-Dangerous-to-Life-or-Health Atmosphere ^f	Qualitative Test	Quantitative Test
Particulate-filter, quarter-mask or half-mask facepiece ^{b,c}	No	No	10	As measured on each person with maximum of 100.
Vapor- or gas-removing, quarter-mask or half-mask facepiece ^c	No	No	10, or maximum use limit of cartridge or canister for vapor or gas, whichever is less.	As measured on each person with maximum of 100, or maximum use limit of cartridge or canister for vapor or gas ^{i,j} , whichever is less.
Combination particulate-filter and vapor- or gas-removing, quarter-mask or half-mask facepiece ^{b,c}	No	No	10, or maximum use limit of cartridge or canister for vapor or gas, whichever is less.	As measured on each person with maximum of 100, or maximum use limit of cartridge or canister for vapor or gas ^{i,j} , whichever is less.
Particulate-filter, full facepiece ^b	No	No	100	As measured on each person with maximum of 100 if dust, fume, or mist filter is used or maximum of 1,000 if high-efficiency filter is used.
Vapor- or gas-removing, full facepiece	No	No	100, or maximum use limit of cartridge or canister for vapor or gas, whichever is less.	As measured on each person with maximum of 1,000 or maximum use limit of cartridge or canister for vapor or gas ^{i,j} , whichever is less.
Combination particulate-filter and vapor- or gas-removing, full facepiece ^b	No	No	100, or maximum use limit of cartridge or canister for vapor or gas, whichever is less.	As measured on each person with maximum of 100 if dust, fume, or mist filter is used and maximum of 1,000 if high-efficiency filter is used, or maximum use limit of cartridge or canister for vapor or gas ^{i,j} , whichever is less.
Powered particulate-filter, any respiratory-inlet covering ^{b,c,d}	No	No (yes, if escape provisions are provided ^d)	N/A No tests are required due to positive-pressure operation of respirator. The maximum protection factor is 100 if dust, fume, or mist filter is used and 3,000 if high-efficiency filter is used.	N/A
Powered vapor- or gas-removing, any respiratory-inlet covering ^{c,d}	No	No (yes, if escape provisions are provided ^d)	N/A No tests are required due to positive-pressure operation of respirator. The maximum protection factor is 3,000 or maximum use limit of cartridge or canister for vapor or gas ^{i,j} , whichever is less.	N/A
Powered combination particulate-filter and vapor- or gas-removing, any respiratory-inlet covering ^{b,c,d}	No	No (yes, if escape provisions are provided ^d)	N/A No tests are required due to positive-pressure operation of respirator. The maximum protection factor is 100 if dust, fume, or mist filter is used and 3,000 if high-efficiency filter is used, or maximum use limit of cartridge or canister for vapor or gas ^{i,j} , whichever is less.	N/A
Air-line, demand, quarter-mask or half-mask facepiece, with or without escape provisions ^{c,e}	Yes ^f	No	10	As measured on each person, but limited to the use of the respirator in concentrations of contaminants below the immediately-dangerous-to-life-or-health (IDLH) values.

(Continued)

Table 5
RESPIRATOR PROTECTION FACTORS^a
(Continued)

Type of Respirator	Permitted for Use in Oxygen-Deficient Atmosphere	Permitted for Use in Immediately-Dangerous-to-Life-or-Health Atmosphere ^f	Qualitative Test	Quantitative Test
Air-line, demand, full facepiece, with or without escape provisions ^a	Yes ^f	No	100	As measured on each person, but limited to the use of the respirators in concentrations of contaminants below the immediately-dangerous-to-life-or-health (IDLH) values.
Air-line, continuous-flow or pressure-demand type, any facepiece without escape provisions ^c	Yes ^f	No	N/A	N/A
Air-line, continuous-flow or pressure-demand type, any facepiece with escape provisions ^{c, g}	Yes ^g	Yes	N/A	N/A
Air-line, continuous flow, helmet, hood, or suit, without escape provisions	Yes ^f	No	N/A	N/A
Air-line continuous flow, helmet, hood, or suit, with escape provisions ^a	Yes ^g	No	N/A	N/A
Hose mask, with or without blower, full facepiece	Yes ^f	No	10	As measured on each person, but limited to the use of the respirator in concentrations of contaminants below the immediately-dangerous-to-life-or-health (IDLH) values.
Self-contained breathing apparatus, demand-type open-circuit, or negative-pressure-type closed-circuit, quarter-mask or half-mask facepiece ^c	Yes ^f	No	10	As measured on each person, but limited to the use of the respirator in concentrations of contaminants below the immediately-dangerous-to-life-or-health (IDLH) values.
Self-contained breathing apparatus, demand-type open-circuit or negative-pressure-type closed-circuit, full facepiece or mouthpiece/nose clamp ^c	Yes (Yes ^g if respirator is used for mine rescue and mine recovery operations.)	No (Yes if respirator is used for mine rescue and mine recovery operations.)	100	As measured on each person, but limited to the use of the respirator in concentrations of contaminants below the immediately-dangerous-to-life-or-health (IDLH) values, except when the respirator is used for mine rescue and mine recovery operations

Table 5
RESPIRATOR PROTECTION FACTORS^a
(Continued)

Type of Respirator	Permitted for Use in Oxygen-Deficient Atmosphere	Permitted for Use in Immediately-Dangerous-to-Life-or-Health Atmosphere ^f	Qualitative Test	Quantitative Test
Self-contained breathing apparatus, pressure-demand type open-circuit or positive-pressure type closed-circuit, quarter-mask or half-mask facepiece, full facepiece, or mouthpiece/nose clamp ^c	Yes ^g	Yes	N/A	N/A
Combination respirators	The type and mode of operation having the lowest respirator protection factor shall be applied to the Combination Respirator not listed.			

N/A/ means not applicable since a respirator-fitting test is not carried out.

^aA respirator protection factor is a measure of the degree of protection provided by a respirator to a respirator wearer. Multiplying the permissible time-weighted average concentration or the permissible ceiling concentration, whichever is applicable, for a toxic substance, or the maximum permissible airborne concentration for a radionuclide, by a protection factor assigned to a respirator gives the maximum concentration of the hazardous substance for which the respirator can be used. Limitations of filters, cartridges, and canisters used in air-purifying respirators shall be considered in determining protection factors.

^bWhen the respirator is used for protection against airborne particulate matter having a permissible time-weighted average concentration less than 0.05 milligram particulate matter per cubic meter of air or less than 2 million particles per cubic foot of air, or for protection against airborne radionuclide particulate matter, the respirator shall be equipped with a high-efficiency filter(s).

^cIf the air contaminant causes eye irritation, the wearer of a respirator equipped with a quarter-mask or half-mask facepiece or mouthpiece and nose clamp shall be permitted to use a protective goggle or to use a respirator equipped with a full facepiece.

^dIf the powered air-purifying respirator is equipped with a facepiece, the escape provision means that the wearer is able to breathe through the filter, cartridge, or a canister and through the pump. If the powered air-purifying respirator is equipped with a helmet, hood, or suit, the escape provision shall be an auxiliary self-contained supply of respirable air.

^eThe escape provision shall be an auxiliary self-contained supply of respirable air.

^fFor definition of "oxygen deficiency - not immediately dangerous to life or health" see WAC 296-62-07105.

^gFor definition of "oxygen deficiency - immediately dangerous to life or health" see WAC 296-62-07105.

^hThe protection factor measurement exceeds the limit of sensitivity of the test apparatus. Therefore, the respirator has been classified for use in atmospheres having unknown concentrations of contaminants.

ⁱThe service life of a vapor-or-gas removing cartridge canister depends on the specific vapor or gas, the concentration of the vapor or gas in air, the temperature and humidity of the air, the type and quantity of the sorbent in the cartridge or canister, and the activity of the respirator wearer. Cartridges and canisters may provide only very short service lives for certain vapors and gases. Vapor/gas service life testing is recommended to ensure that cartridges and canisters provide adequate service lives. Reference should be made to published reports which give vapor/gas life data for cartridges and canisters.

^jVapor-and-gas removing respirators are not approved for contaminants that lack adequate warning properties of odor, irritation, or taste at concentrations in air at or above the permissible exposure limits.

NOTE: Respirator protection factors for air-purifying-type respirators equipped with a mouthpiece/nose clamp form of respirator-inlet covering are not given, since such respirators are approved only for escape purposes.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-62-07113, filed 7/6/88. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-16-016 (Order 81-19), § 296-62-07113, filed 7/27/81.]

WAC 296-62-07115 Use of respirators. (1) Standard operating procedures. Written standard operating procedures shall cover a complete respirator program and shall include information necessary for the proper use of respirators, including training of respirator wearers, respirator sealing tests, issuance of respirators, inspection of respirators prior to use, monitoring respirator use, monitoring respiratory hazard, and planning for routine, nonroutine, emergency, and rescue uses of respirators.

(a) The written standard operating procedures shall include plans necessary to ensure the safe routine use and nonroutine use of respirators. Emergency and rescue uses of respirators shall be anticipated, and the written standard operating procedures shall include plans necessary to ensure the safe emergency and rescue uses of respirators. Persons who wear respirators routinely, who wear respirators nonroutinely, and who may be required to wear respirators for emergency and rescue work shall

be given adequate information concerning plans covering these respirator uses to ensure the safe use of respirators.

(b) Standard operating procedures for emergency and rescue use of respirators. It is recognized that it is not possible to foresee every emergency and rescue use of respirators for every kind of operation. Nevertheless, a wide variety of possible conditions requiring the emergency or rescue use of respirators can be envisioned and an adequate emergency and rescue respirator-response capability can be achieved through a serious effort to anticipate the worst possible consequences of particular malfunctions or mishaps.

The written standard operating procedures governing the emergency and rescue uses of respirators shall be developed in the following manner:

(i) An analysis of the emergency and rescue uses of respirators that may occur in each operation shall be made by careful consideration of materials, equipment, processes, and personnel involved. Such an analysis shall be reviewed by the person who is thoroughly familiar with the particular operation. Consideration shall be given to past occurrences requiring emergency or rescue uses of respirators as well as conditions which resulted in

such respirator applications. The possible consequences of equipment or power failures, uncontrolled chemical reactions, fire, explosion, or human error shall be given consideration. All potential hazards which may result in emergency or rescue use of respirators shall be listed.

(ii) Based upon the analysis, appropriate types of respirators shall be selected, an adequate number shall be provided for each area where they may be needed for emergency or rescue use, and these respirators shall be maintained and stored so that they are readily accessible and operational when needed.

(iii) In areas where the wearer, with failure of the respirator, could be overcome by a toxic or oxygen-deficient atmosphere, at least one additional person shall be present. Communications (visual, voice, or signal line) shall be maintained between both or all individuals present. Planning shall be such that one individual will be unaffected by any likely incident and have the proper rescue equipment to be able to assist the other(s) in case of emergency.

(iv) When self-contained breathing apparatus or air-line respirators with an escape provision are used in atmospheres immediately dangerous to life or health, standby workers must be present at the nearest fresh air base with suitable rescue equipment.

(v) Persons using air line respirators in atmospheres immediately hazardous to life or health shall be equipped with safety harnesses and safety lines for lifting or removing persons from hazardous atmospheres or other and equivalent provisions for the rescue of persons from hazardous atmospheres shall be used. A standby worker or workers with suitable self-contained breathing apparatus shall be at the nearest fresh air base for emergency rescue.

(2) Training. The supervisor, the person issuing respirators, and the respirator wearers shall be given adequate training by a qualified person(s) to ensure the proper use of respirators. Written records shall be kept of the names of the persons trained and the dates when training occurred.

(a) Training of supervisor. A supervisor - that is, a person who has the responsibility of overseeing the work activities of one or more persons who must wear respirators - shall be given adequate training to ensure the proper use of respirators.

(b) Training of person issuing respirators. A person assigned the task of issuing respirators to persons who must wear respirators for protection against harmful atmospheres shall be given adequate training to ensure that the correct respirator is issued for each application in accordance with written standard operating procedures.

(c) Training of respirator wearer. To ensure the proper and safe use of a respirator, the minimum training of each respirator wearer shall include the following elements:

- (i) The reasons for the need of respiratory protection.
- (ii) The nature, extent, and effects of respiratory hazards to which the person may be exposed.
- (iii) An explanation of why engineering controls are not being applied or are not adequate and of what effort

is being made to reduce or eliminate the need for respirators.

(iv) An explanation of why a particular type of respirator has been selected for a specific respiratory hazard.

(v) An explanation of the operation, and the capabilities and limitations, of the respirator selected.

(vi) Instruction in inspecting, donning, checking the fit of, and wearing the respirator.

(vii) An opportunity for each respirator wearer to handle the respirator, learn how to don and wear it properly, check its seals, wear it in a safe atmosphere, and wear it in a test atmosphere.

(viii) An explanation of how maintenance and storage of the respirator is carried out.

(ix) Instructions in how to recognize and cope with emergency situations.

(x) Instructions as needed for special respirator use.

(xi) Regulations concerning respirator use.

(A) Wearing instructions and training. Wearing instructions and training, including practice demonstrations, shall be given to each respirator wearer and shall cover:

(I) Donning, wearing, and removing the respirator.

(II) Adjusting the respirator so that its respiratory-inlet covering is properly fitted on the wearer and so that the respirator causes a minimum of discomfort to the wearer.

(III) Allowing the respirator wearer to wear the respirator in a safe atmosphere for an adequate period of time to ensure that the wearer is familiar with the operational characteristics of the respirator.

(IV) Providing the respirator wearer an opportunity to wear the respirator in a test atmosphere to demonstrate that the respirator provides protection to the wearer. A test atmosphere is any atmosphere in which the wearer can carry out activities simulating work movements and respirator leakage or respirator malfunction can be detected by the wearer.

(B) Retraining. Each respirator wearer shall be retrained as necessary to assure effective respirator use. Refresher training shall be given at least annually and shall include the provisions of (c)(vii) through (xi)(A)(III) of this subsection.

(3) Respirator sealing problems. Respirators shall not be worn when conditions prevent a seal of the respirator to the wearer.

(a) A person who has hair (stubble, moustache, sideburns, beard, low hairline, bangs) which passes between the face and the sealing surface of the facepiece of the respirator shall not be permitted to wear such a respirator.

(b) A person who has hair (moustache, beard) which interferes with the function of a respirator valve(s) shall not be permitted to wear the respirator.

(c) A spectacle which has temple bars or straps which pass between the sealing surface of a respirator full facepiece and the wearer's face shall not be used.

(d) A head covering which passes between the sealing surface of a respirator facepiece and the wearer's face shall not be used.

(e) The wearing of a spectacle, a goggle, a faceshield, a welding helmet, or other eye and face protective device which interferes with the seal of a respirator to the wearer shall not be allowed.

(f) If scars, hollow temples, excessively protruding cheekbones, deep creases in facial skin, the absence of teeth or dentures, or unusual facial configurations prevent a seal of a respirator facepiece to a wearer's face, the person shall not be permitted to wear the respirator.

(g) If missing teeth or dentures prevent a seal of a respirator mouthpiece in a person's mouth, the person shall not be allowed to wear a respirator equipped with a mouthpiece.

(h) If a person has a nose of a shape or size which prevents the closing of the nose by the nose clamp of a mouthpiece/nose-clamp type of respirator, the person shall not be permitted to wear this type of respirator.

(4) Respirator sealing tests. To ensure proper protection, the wearer of a respirator equipped with a facepiece shall check the seal of the facepiece prior to each entry into a hazardous atmosphere. This may be done using procedures recommended by respirator manufacturers or by approved field tests.

(5) Issuance of respirators. The proper respirator shall be specified for each application and shall be listed in the written standard operating procedures. If a respirator is marked for the worker to whom it is assigned or for other identification purposes, the markings shall not affect the respirator performance in any way.

(6) Respirator inspection prior to use. Each person issued a respirator for routine, nonroutine, emergency, or rescue use shall inspect the respirator prior to its use to ensure that it is in good operating condition.

(7) Monitoring respirator use. The use of respirators on a routine or nonroutine basis shall be monitored to ensure that the correct respirators are being used, that the respirators are being worn properly and that the respirators being used are in good working condition.

(8) Evaluation of respiratory hazard during use. The level of the respiratory hazard in the workplace to which a person wearing a respirator is exposed shall be evaluated periodically.

(9) Leaving a hazardous area. A respirator wearer shall be permitted to leave the hazardous area for any respirator-related cause. Reasons which may cause a respirator wearer to leave a hazardous area include, but are not limited to, the following:

(a) Failure of the respirator to provide adequate protection.

(b) Malfunction of the respirator.

(c) Detection of leakage of air contaminant into the respirator.

(d) Increase in resistance of respirator to breathing.

(e) Severe discomfort in wearing the respirator.

(f) Illness of respirator wearer, including: Sensation of dizziness, nausea, weakness, breathing difficulty, coughing, sneezing, vomiting, fever, and chills.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-62-07115, filed 7/6/88. Statutory Authority: RCW 49.17-.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-07115, filed 11/30/83; 82-08-026 (Order 82-10), § 296-62-07115, filed 3/30/82.]

Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-16-016 (Order 81-19), § 296-62-07115, filed 7/27/81.]

PART F--CARCINOGENS

WAC 296-62-073 Carcinogens--Scope and application. (1) All sections of this chapter which include WAC 296-62-073 in the section number apply to the manufacturing, processing, repackaging, releasing, handling or storing of carcinogens.

(2) This section shall not apply to solid or liquid mixtures containing less than 0.1 percent by weight or volume of the carcinogens listed in WAC 296-62-07302.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-073, filed 11/30/87. Statutory Authority: RCW 49.17-.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-62-073, filed 11/13/80; Order 76-6, § 296-62-073, filed 3/1/76; Order 74-35, § 296-62-073, filed 9/20/74.]

WAC 296-62-07304 Definitions. The definitions set forth in this section apply throughout WAC 296-62-073 through 296-62-07316.

(1) Absolute filter - is one capable of retaining 99.97 percent of a mono disperse aerosol of 0.3 micron size particles.

(2) Authorized employee - an employee whose duties require him to be in the regulated area and who has been specifically assigned to those duties by the employer.

(3) Clean change room - a room where employees put on clean clothing and/or protective equipment in an environment free of carcinogens listed in WAC 296-62-07302. The clean change room shall be contiguous to and have an entry from a shower room, when the shower room facilities are otherwise required in this section.

(4) Closed system - an operation involving carcinogens listed in WAC 296-62-07302 where containment prevents the release of carcinogens into regulated areas, or the external environment.

(5) Decontamination - the inactivation of a carcinogen listed in WAC 296-62-07302 or its safe disposal.

(6) Disposal - the safe removal of a carcinogen listed in WAC 296-62-07302 from the work environment.

(7) Emergency - an unforeseen circumstance or set of circumstances resulting in the release of a carcinogen which may result in exposure to or contact with any carcinogen listed in WAC 296-62-07302.

(8) External environment - any environment external to regulated and nonregulated areas.

(9) Isolated system - a fully enclosed structure other than the vessel of containment of a listed carcinogen which is impervious to the passage of listed carcinogens and which would prevent the entry of carcinogens into regulated areas, nonregulated areas, or the external environment, should leakage or spillage from the vessel of containment occur.

(10) Laboratory-type hood - a device enclosed on three sides and the top and bottom, designed and maintained so as to draw air inward at an average linear face velocity of 150 feet per minute with a minimum of 125 feet per minute, designed, constructed and maintained

such that an operation involving a listed carcinogen within the hood does not require the insertion of any portion of any employees' body other than his hands and arms.

(11) Nonregulated area – any area under the control of the employer where entry and exit is neither restricted nor controlled.

(12) Open-vessel system – an operation involving listed carcinogens in an open vessel, which is not in an isolated system, a laboratory-type hood, nor in any other system affording equivalent protection against the entry of carcinogens into regulated areas, nonregulated areas, or the external environment.

(13) Protective clothing – clothing designed to protect an employee against contact with or exposure to listed carcinogens.

(14) Regulated area – an area where entry and exit is restricted and controlled.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07304, filed 11/30/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 81-07-048 (Order 81-4), § 296-62-07304, filed 3/17/81. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-62-07304, filed 11/13/80.]

WAC 296-62-07310 Signs, information and training. (1) Signs.

(a) Entrances to regulated areas shall be posted with signs bearing the legend:

CANCER-SUSPECT AGENT

AUTHORIZED PERSONNEL ONLY

(b) Entrances to regulated areas containing operations covered in WAC 296-62-07306 (2)(e) shall be posted with signs bearing the legend:

CANCER-SUSPECT AGENT EXPOSED IN THIS AREA

IMPERVIOUS SUIT INCLUDING GLOVES,
BOOTS, AND AIR-SUPPLIED HOOD
REQUIRED AT ALL TIMES

AUTHORIZED PERSONNEL ONLY

(c) Appropriate signs and instructions shall be posted at the entrance to, and exit from, regulated areas, informing employees of the procedures that must be followed in entering and leaving a regulated area.

(2) Container contents, identification.

(a) Containers of carcinogens named in WAC 296-62-07302 and containers required in WAC 296-62-07306 (2)(d)(v) and 296-62-07306 (2)(f)(vii)(B) and 296-62-07306 (2)(f)(viii)(B) which are accessible only to, and handled only by authorized employees, or by other employees training in accordance with WAC 296-62-07310(5), may have contents identification limited to a generic or proprietary name, or other proprietary identification of the carcinogen and percent.

(b) Containers of carcinogens and containers required under WAC 296-62-07306 (2)(d)(v) and 296-62-07306 (2)(f)(vii)(B) and 296-62-07306 (2)(f)(viii)(B)

which are accessible to, or handled by employees other than authorized employees or employees trained in accordance with WAC 296-62-07310(5) shall have contents identification which includes the full chemical name and Chemical Abstracts Service Registry number as listed in WAC 296-62-07302.

(c) Containers shall have the warning words "CANCER-SUSPECT AGENT" displayed immediately under or adjacent to the contents identification.

(d) Containers which have carcinogenic contents with corrosive or irritating properties shall have label statements warning of such hazards, noting, if appropriate, particularly sensitive or affected portions of the body.

(3) Lettering. Lettering on signs and instructions required by WAC 296-62-07310(1) shall be a minimum letter height of two inches. Labels on containers required under this section shall not be less than one-half the size of the largest lettering on the package, and not less than eight point type in any instance: Provided, that no such required lettering need be more than one inch in height.

(4) Prohibited statements. No statements shall appear on or near any required sign, label, or instruction which contradicts or detracts from the effect of any required warning, information or instruction.

(5) Training and indoctrination.

(a) Each employee prior to being authorized to enter a regulated area, shall receive a training and indoctrination program including, but not necessarily limited to:

(i) The nature of the carcinogenic hazards of listed carcinogens, including local and systemic toxicity;

(ii) The specific nature of the operation involving carcinogens which could result in exposure;

(iii) The purpose for and application of the medical surveillance program, including, as appropriate, methods of self-examination;

(iv) The purpose for and application of decontamination practices and purposes;

(v) The purpose for and significance of emergency practices and procedures;

(vi) The employee's specific role in emergency procedures;

(vii) Specific information to aid the employee in recognition and evaluation of conditions and situations which may result in the release of listed carcinogens;

(viii) The purpose for and application of specific first-aid procedures and practices;

(ix) A review of this section at the employee's first training and indoctrination program and annually thereafter.

(b) Specific emergency procedures shall be prescribed, and posted, and employees, shall be familiarized with their terms, and rehearsed in their application.

(c) All materials relating to the program shall be provided upon request to the director.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07310, filed 11/30/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 81-07-048 (Order 81-4), § 296-62-07310, filed 3/17/81. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-62-07310, filed 11/13/80.]

PART G--CARCINOGENS (SPECIFIC)

WAC 296-62-07336 Acrylonitrile. (1) Scope and application.

(a) This section applies to all occupational exposure to acrylonitrile (AN), Chemical Abstracts Service Registry No. 000107131, except as provided in (b) and (c) of this subsection.

(b) This section does not apply to exposures which result solely from the processing, use, and handling of the following materials:

(i) ABS resins, SAN resins, nitrile barrier resins, solid nitrile elastomers, and acrylic and modacrylic fibers, when these listed materials are in the form of finished polymers, and products fabricated from such finished polymers;

(ii) Materials made from and/or containing AN for which objective data is reasonably relied upon to demonstrate that the material is not capable of releasing AN in airborne concentrations in excess of 1 ppm as an eight-hour time-weighted average, under the expected conditions of processing, use, and handling which will cause the greatest possible release; and

(iii) Solid materials made from and/or containing AN which will not be heated above 170°F during handling, use, or processing.

(c) An employer relying upon exemption under (1)(b)(ii) shall maintain records of the objective data supporting that exemption, and of the basis of the employer's reliance on the data as provided in subsection (17) of this section.

(2) Definitions, as applicable to this section:

(a) "Acrylonitrile" or "AN" - acrylonitrile monomer, chemical formula $\text{CH}_2=\text{CHCN}$.

(b) "Action level" - a concentration of AN of 1 ppm as an eight-hour time-weighted average.

(c) "Authorized person" - any person specifically authorized by the employer whose duties require the person to enter a regulated area, or any person entering such an area as a designated representative of employees for the purpose of exercising the opportunity to observe monitoring procedures under subsection (18) of this section.

(d) "Decontamination" means treatment of materials and surfaces by water washdown, ventilation, or other means, to assure that the materials will not expose employees to airborne concentrations of AN above 1 ppm as an eight-hour time-weighted average.

(e) "Director" - the director of labor and industries, or his authorized representative.

(f) "Emergency" - any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment, which is likely to, or does, result in unexpected exposure to AN in excess of the ceiling limit.

(g) "Liquid AN" means AN monomer in liquid form, and liquid or semiliquid polymer intermediates, including slurries, suspensions, emulsions, and solutions, produced during the polymerization of AN.

(h) "Polyacrylonitrile" or "PAN" - polyacrylonitrile homopolymers or copolymers, except for materials as exempted under subsection (1)(b) of this section.

(3) Permissible exposure limits.

(a) Inhalation.

(i) Time-weighted average limit (TWA). The employer shall assure that no employee is exposed to an airborne concentration of acrylonitrile in excess of two parts acrylonitrile per million parts of air (2 ppm), as an eight-hour time-weighted average.

(ii) Ceiling limit. The employer shall assure that no employee is exposed to an airborne concentration of acrylonitrile in excess of 10 ppm as averaged over any fifteen-minute period during the working day.

(b) Dermal and eye exposure. The employer shall assure that no employee is exposed to skin contact or eye contact with liquid AN or PAN.

(4) Notification of use and emergencies.

(a) Use. Within ten days of the effective date of this standard, or within fifteen days following the introduction of AN into the workplace, every employer shall report, unless he has done so pursuant to the emergency temporary standard, the following information to the director for each such workplace:

(i) The address and location of each workplace in which AN is present;

(ii) A brief description of each process of operation which may result in employee exposure to AN;

(iii) The number of employees engaged in each process or operation who may be exposed to AN and an estimate of the frequency and degree of exposure that occurs; and

(iv) A brief description of the employer's safety and health program as it relates to limitation of employee exposure to AN. Whenever there has been a significant change in the information required by this subsection, the employer shall promptly amend such information previously provided to the director.

(b) Emergencies and remedial action. Emergencies, and the facts obtainable at that time, shall be reported within 24 hours of the initial occurrence to the director. Upon request of the director, the employer shall submit additional information in writing relevant to the nature and extent of employee exposures and measures taken to prevent future emergencies of a similar nature.

(5) Exposure monitoring.

(a) General.

(i) Determinations of airborne exposure levels shall be made from air samples that are representative of each employee's exposure to AN over an eight-hour period.

(ii) For the purposes of this section, employee exposure is that which would occur if the employee were not using a respirator.

(b) Initial monitoring. Each employer who has a place of employment in which AN is present shall monitor each such workplace and work operation to accurately determine the airborne concentrations of AN to which employees may be exposed. Such monitoring may be done on a representative basis, provided that the employer can demonstrate that the determinations are representative of employee exposures.

(c) Frequency.

(i) If the monitoring required by this section reveals employee exposure to be below the action level, the employer may discontinue monitoring for that employee. The employer shall continue these quarterly measurements until at least two consecutive measurements taken at least seven days apart, are below the action level, and thereafter the employer may discontinue monitoring for that employee.

(ii) If the monitoring required by this section reveals employee exposure to be at or above the action level but below the permissible exposure limits, the employer shall repeat such monitoring for each such employee at least quarterly.

(iii) If the monitoring required by this section reveals employee exposure to be in excess of the permissible exposure limits, the employer shall repeat these determinations for each such employee at least monthly. The employer shall continue these monthly measurements until at least two consecutive measurements, taken at least seven days apart, are below the permissible exposure limits, and thereafter the employer shall monitor at least quarterly.

(d) Additional monitoring. Whenever there has been a production, process, control or personnel change which may result in new or additional exposure to AN, or whenever the employer has any other reason to suspect a change which may result in new or additional exposures to AN, additional monitoring which complies with this subsection shall be conducted.

(e) Employee notification.

(i) Within five working days after the receipt of monitoring results, the employer shall notify each employee in writing of the results which represent that employee's exposure.

(ii) Whenever the results indicate that the representative employee exposure exceeds the permissible exposure limits, the employer shall include in the written notice a statement that the permissible exposure limits were exceeded and a description of the corrective action being taken to reduce exposure to or below the permissible exposure limits.

(f) Accuracy of measurement. The method of measurement of employee exposures shall be accurate, to a confidence level of 95 percent, to within plus or minus 25 percent for concentrations of AN at or above the permissible exposure limits, and plus or minus 35 percent for concentrations of AN between the action level and the permissible exposure limits.

(g) Weekly survey of operations involving liquid AN. In addition to monitoring of employee exposures to AN as otherwise required by this subsection, the employer shall survey areas of operations involving liquid AN at least weekly to detect points where AN liquid or vapor are being released into the workplace. The survey shall employ an infra-red gas analyzer calibrated for AN, a multipoint gas chromatographic monitor, or comparable system for detection of AN. A listing of levels detected and areas of AN release, as determined from the survey, shall be posted prominently in the workplace, and shall remain posted until the next survey is completed.

(6) Regulated areas.

(a) The employer shall establish regulated areas where AN concentrations are in excess of the permissible exposure limits.

(b) Regulated areas shall be demarcated and segregated from the rest of the workplace, in any manner that minimizes the number of persons who will be exposed to AN.

(c) Access to regulated areas shall be limited to authorized persons or to persons otherwise authorized by the act or regulations issued pursuant thereto.

(d) The employer shall assure that in the regulated area, food or beverages are not present or consumed, smoking products are not present or used, and cosmetics are not applied, (except that these activities may be conducted in the lunchrooms, change rooms and showers required under subsections (13)(a)-(13)(c) of this section.

(7) Methods of compliance.

(a) Engineering and work practice controls.

(i) The employer shall institute engineering or work practice controls to reduce and maintain employee exposures to AN, to or below the permissible exposure limits, except to the extent that the employer establishes that such controls are not feasible.

(ii) Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limits, the employer shall nonetheless use them to reduce exposures to the lowest levels achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of subsection (8) of this section.

(b) Compliance program.

(i) The employer shall establish and implement a written program to reduce employee exposures to or below the permissible exposure limits solely by means of engineering and work practice controls, as required by subsection (7)(a) of this section.

(ii) Written plans for these compliance programs shall include at least the following:

(A) A description of each operation or process resulting in employee exposure to AN above the permissible exposure limits;

(B) Engineering plans and other studies used to determine the controls for each process;

(C) A report of the technology considered in meeting the permissible exposure limits;

(D) A detailed schedule for the implementation of engineering or work practice controls; and

(E) Other relevant information.

(iii) The employer shall complete the steps set forth in the compliance program by the dates in the schedule.

(iv) Written plans for such a program shall be submitted upon request to the director, and shall be available at the worksite for examination and copying by the director, or any affected employee or representative.

(v) The plans required by this subsection shall be revised and updated at least every six months to reflect the current status of the program.

(8) Respiratory protection.

(a) General. The employer shall assure that respirators are used where required pursuant to this section to reduce employee exposure to within the permissible exposure limits and in emergencies. Compliance with the permissible exposure limits may not be achieved by the use of respirators except:

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

(ii) In work operations such as maintenance and repair activities in which the employer establishes that engineering and work practice controls are not feasible; or

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

(iv) In emergencies.

(b) Respirator selection.

(i) Where respiratory protection is required under this section, the employer shall select and provide at no cost to the employee, the appropriate type of respirator from Table I and shall assure that the employee wears the respirator provided.

TABLE I

RESPIRATORY PROTECTION FOR ACRYLONITRILE (AN)

Concentration of AN or Condition of Use	Respirator Type
(a) Less than or equal to 25 x permissible exposure limits.	(i) Any Type C supplied air respirator.
(b) Less than or equal to 100 x permissible exposure limits.	(i) Any supplied air respirator with full facepiece; or
	(ii) Any self-contained breathing apparatus with full facepiece.
(c) Less than or equal to 250 x permissible exposure limits.	(i) Supplied air respirator in positive pressure mode with full facepiece, helmet, hood, or suit.
	(ii) Open circuit self-contained breathing apparatus with full facepiece in positive pressure mode.
(d) Greater than 250 x permissible exposure limits.	(i) Supplied air respirator with full facepiece and an auxiliary self-contained air supply, operated in pressure demand mode; or
	(ii) Open circuit self-contained breathing apparatus with full facepiece in positive pressure mode.
(e) Emergency entry into unknown concentration or firefighting	(i) Any self-contained breathing apparatus with full facepiece in positive pressure mode.
(f) Escape.	(i) Any organic vapor gas mask; or
	(ii) Any self-contained breathing.

(ii) The employer shall select respirators from those approved for use with AN by the National Institute for Occupational Safety and Health under the provisions of WAC 296-62-071.

(c) Respirator program.

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

(ii) Testing. Fit testing of respirators shall be performed to assure that the respirator selected provides the protection required by Table I.

(A) Qualitative fit. The employer shall perform qualitative fit tests at the time of initial fitting and at least

semiannually thereafter for each employee wearing respirators.

(B) Quantitative fit. Each employer with more than ten employees wearing negative pressure respirators shall perform quantitative fit testing at the time of initial fitting and at least semiannually thereafter for each such employee.

(iii) Employees who wear respirators shall be allowed to wash their faces and respirator facepieces to prevent potential skin irritation associated with respirator use.

(9) Emergency situations.

(a) Written plans.

(i) A written plan for emergency situations shall be developed for each workplace where AN is present. Appropriate portions of the plan shall be implemented in the event of an emergency.

(ii) The plan shall specifically provide that employees engaged in correcting emergency conditions shall be equipped as required in subsection (8) of this section until the emergency is abated.

(b) Alerting employees.

(i) Where there is the possibility of employee exposure to AN in excess of the ceiling limit due to the occurrence of an emergency, a general alarm shall be installed and maintained to promptly alert employees of such occurrences.

(ii) Employees not engaged in correcting the emergency shall be evacuated from the area and shall not be permitted to return until the emergency is abated.

(10) Protective clothing and equipment.

(a) Provision and use. Where eye or skin contact with liquid AN or PAN may occur, the employer shall provide at no cost to the employee, and assure that employees wear, appropriate protective clothing or other equipment in accordance with WAC 296-24-07501 and 296-24-07801 to protect any area of the body which may come in contact with liquid AN or PAN.

(b) Cleaning and replacement.

(i) The employer shall clean, launder, maintain, or replace protective clothing and equipment required by this subsection, as needed to maintain their effectiveness. In addition, the employer shall provide clean protective clothing and equipment at least weekly to each affected employee.

(ii) The employer shall assure that impermeable protective clothing which contacts or is likely to have contacted liquid AN shall be decontaminated before being removed by the employee.

(iii) The employer shall assure that AN- or PAN-contaminated protective clothing and equipment is placed and stored in closable containers which prevent dispersion of the AN or PAN outside the container.

(iv) The employer shall assure that an employee whose nonimpermeable clothing becomes wetted with liquid AN shall immediately remove that clothing and proceed to shower. The clothing shall be decontaminated before it is removed from the regulated area.

(v) The employer shall assure that no employee removes AN- or PAN-contaminated protective equipment

or clothing from the change room, except for those employees authorized to do so for the purpose of laundering, maintenance, or disposal.

(vi) The employer shall inform any person who launders or cleans AN-or PAN-contaminated protective clothing or equipment of the potentially harmful effects of exposure to AN.

(vii) The employer shall assure that containers of contaminated protective clothing and equipment which are to be removed from the workplace for any reason are labeled in accordance with subsection (16)(c)(ii) of this section, and that such labels remain affixed when such containers leave the employer's workplace.

(11) Housekeeping.

(a) All surfaces shall be maintained free of accumulations of liquid AN and of PAN.

(b) For operations involving liquid AN, the employer shall institute a program for detecting leaks and spills of liquid AN, including regular visual inspections.

(c) Where spills of liquid AN are detected, the employer shall assure that surfaces contacted by the liquid AN are decontaminated. Employees not engaged in decontamination activities shall leave the area of the spill, and shall not be permitted in the area until decontamination is completed.

(d) Liquids. Where AN is present in a liquid form, or as a resultant vapor, all containers or vessels containing AN shall be enclosed to the maximum extent feasible and tightly covered when not in use, with adequate provision made to avoid any resulting potential explosion hazard.

(e) Surfaces.

(i) Dry sweeping and the use of compressed air for the cleaning of floors and other surfaces where AN and PAN are found is prohibited.

(ii) Where vacuuming methods are selected, either portable units or a permanent system may be used.

(A) If a portable unit is selected, the exhaust shall be attached to the general workplace exhaust ventilation system or collected within the vacuum unit, equipped with high efficiency filters or other appropriate means of contaminant removal, so that AN is not reintroduced into the workplace air; and

(B) Portable vacuum units used to collect AN may not be used for other cleaning purposes and shall be labeled as prescribed by subsection (16)(c)(ii) of this section.

(iii) Cleaning of floors and other contaminated surfaces may not be performed by washing down with a hose, unless a fine spray has first been laid down.

(12) Waste disposal. AN and PAN waste, scrap, debris, bags, containers or equipment, shall be disposed of in sealed bags or other closed containers which prevent dispersion of AN outside the container, and labeled as prescribed in subsection (16)(c)(ii) of this section.

(13) Hygiene facilities and practices. Where employees are exposed to airborne concentrations of AN above the permissible exposure limits, or where employees are required to wear protective clothing or equipment pursuant to subsection (11) of this section, or where otherwise found to be appropriate, the facilities required by

WAC 296-24-12009 shall be provided by the employer for the use of those employees, and the employer shall assure that the employees use the facilities provided. In addition, the following facilities or requirements are mandated.

(a) Change rooms. The employer shall provide clean change rooms in accordance with WAC 296-24-12011.

(b) Showers.

(i) The employer shall provide shower facilities in accordance with WAC 296-24-12009(3).

(ii) In addition, the employer shall also assure that employees exposed to liquid AN and PAN shower at the end of the work shift.

(iii) The employer shall assure that, in the event of skin or eye exposure to liquid AN, the affected employee shall shower immediately to minimize the danger of skin absorption.

(c) Lunchrooms.

(i) Whenever food or beverages are consumed in the workplace, the employer shall provide lunchroom facilities which have a temperature controlled, positive pressure, filtered air supply, and which are readily accessible to employees exposed to AN above the permissible exposure limits.

(ii) In addition, the employer shall also assure that employees exposed to AN above the permissible exposure limits wash their hands and face prior to eating.

(14) Medical surveillance.

(a) General.

(i) The employer shall institute a program of medical surveillance for each employee who is or will be exposed to AN above the action level. The employer shall provide each such employee with an opportunity for medical examinations and tests in accordance with this subsection.

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

(b) Initial examinations. At the time of initial assignment, or upon institution of the medical surveillance program, the employer shall provide each affected employee an opportunity for a medical examination, including at least the following elements:

(i) A work history and medical history with special attention to skin, respiratory, and gastrointestinal systems, and those non-specific symptoms, such as headache, nausea, vomiting, dizziness, weakness, or other central nervous system dysfunctions that may be associated with acute or chronic exposure to AN.

(ii) A physical examination giving particular attention to central nervous system, gastrointestinal system, respiratory system, skin and thyroid.

(iii) A 14" x 17" posteroanterior chest x-ray.

(iv) Further tests of the intestinal tract, including fecal occult blood screening, and proctosigmoidoscopy, for all workers 40 years of age or older, and for any other affected employees for whom, in the opinion of the physician, such testing is appropriate.

(c) Periodic examinations.

(i) The employer shall provide examinations specified in this subsection at least annually for all employees specified in subsection (14)(a) of this section.

(ii) If an employee has not had the examinations prescribed in subsection (14)(b) of this section within six months of termination of employment, the employer shall make such examination available to the employee upon such termination.

(d) Additional examinations. If the employee for any reason develops signs or symptoms commonly associated with exposure to AN, the employer shall provide appropriate examination and emergency medical treatment.

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

(i) A copy of this standard and its appendices;

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

(iii) The employee's representative exposure level;

(iv) The employee's anticipated or estimated exposure level (for preplacement examinations or in cases of exposure due to an emergency);

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

(vi) Information from previous medical examinations of the affected employee, which is not otherwise available to the examining physician.

(f) Physician's written opinion.

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

(A) The results of the medical examination and test performed;

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

(C) Any recommended limitations upon the employee's exposure to AN or upon the use of protective clothing and equipment such as respirators; and

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

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

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

(15) Employee information and training.

(a) Training program.

(i) The employer shall institute a training program for all employees where there is occupational exposure to AN and shall assure their participation in the training program.

(ii) The training program shall be provided at the time of initial assignment, or upon institution of the training program, and at least annually thereafter, and the employer shall assure that each employee is informed of the following:

(A) The information contained in Appendices A, B and C;

(B) The quantity, location, manner of use, release or storage of AN and the specific nature of operations which could result in exposure to AN, as well as any necessary protective steps;

(C) The purpose, proper use, and limitations of respirators and protective clothing;

(D) The purpose and a description of the medical surveillance program required by subsection (14) of this section;

(E) The emergency procedures developed, as required by subsection (9) of this section; and

(F) The engineering and work practice controls, their function and the employee's relationship thereto; and

(G) A review of this standard.

(b) Access to training materials.

(i) The employer shall make a copy of this standard and its appendices readily available to all affected employees.

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

(16) Signs and labels.

(a) General.

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

(ii) The employer shall assure that no statement appears on or near any sign or label, required by this subsection, which contradicts or detracts from such effects of the required sign or label.

(b) Signs.

(i) The employer shall post signs to clearly indicate all workplaces where AN concentrations exceed the permissible exposure limits. The signs shall bear the following legend:

DANGER
ACRYLONITRILE (AN)
CANCER HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS REQUIRED

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

(c) Labels.

(i) The employer shall assure that precautionary labels are affixed to all containers of AN, and to containers of PAN and products fabricated from PAN, except for those materials for which objective data is provided as to the conditions specified in subsection (1)(b) of this section. The employer shall assure that the labels remain affixed when the AN or PAN are sold, distributed or otherwise leave the employer's workplace.

(ii) The employer shall assure that the precautionary labels required by this subsection are readily visible and legible. The labels shall bear the following legend:

DANGER
CONTAINS ACRYLONITRILE (AN)
CANCER HAZARD

(17) Recordkeeping.

(a) Objective data for exempted operations.

(i) Where the processing, use, and handling of products fabricated from PAN are exempted pursuant to subsection (1)(b) of this section, the employer shall establish and maintain an accurate record of objective data reasonably relied upon in support of the exemption.

(ii) This record shall include the following information:

(A) The relevant condition in subsection (1)(b) upon which exemption is based;

(B) The source of the objective data;

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

(D) A description of the operation exempted and how the data supports the exemption; and

(E) Other data relevant to the operations, materials, and processing covered by the exemption.

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

(b) Exposure monitoring.

(i) The employer shall establish and maintain an accurate record of all monitoring required by subsection (5) of this section.

(ii) This record shall include:

(A) The dates, number, duration, and results of each of the samples taken, including a description of the sampling procedure used to determine representative employee exposure;

(B) A description of the sampling and analytical methods used and the data relied upon to establish that the methods used meet the accuracy and precision requirements of subsection (5)(f) of this section;

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

(D) Name, social security number and job classification of the employee monitored and of all other employees whose exposure the measurement is intended to represent.

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

(c) Medical surveillance.

(i) The employer shall establish and maintain an accurate record for each employee subject to medical surveillance as required by subsection (14) of this section.

(ii) This record shall include:

(A) A copy of the physicians' written opinions;

(B) Any employee medical complaints related to exposure to AN;

(C) A copy of the information provided to the physician as required by subsection (14)(f) of this section; and

(D) A copy of the employee's medical and work history.

(iii) The employer shall assure that this record be maintained for at least forty years or for the duration of employment plus twenty years, whichever is longer.

(d) Availability.

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

(ii) Records required by subdivisions (a) through (c) of this subsection shall be provided upon request to employees, designated representatives, and the assistant director in accordance with WAC 296-62-05201 through 296-62-05209 and 296-62-05213 through 296-62-05217. Records required by subdivision (a) of this section shall be provided in the same manner as exposure monitoring records.

(iii) The employer shall assure that employee medical records required to be maintained by this section, be made available, upon request, for examination and copying, to the affected employee or former employee, or to a physician designated by the affected employee, former employee, or designated representative.

(e) Transfer of records.

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

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

(iii) At the expiration of the retention period for the records required to be maintained pursuant to this section, the employer shall transmit these records to the director.

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

(18) Observation of monitoring.

(a) Employee observation. The employer shall provide affected employees, or their designated representatives, an opportunity to observe any monitoring of employee exposure to AN conducted pursuant to subsection (5) of this section.

(b) Observation procedures.

(i) Whenever observation of the monitoring of employee exposure to AN requires entry into an area where the use of protective clothing or equipment is required, the employer shall provide the observer with personal protective clothing or equipment required to be worn by employees working in the area, assure the use of such clothing and equipment, and require the observer to comply with all other applicable safety and health procedures.

(ii) Without interfering with the monitoring, observers shall be entitled:

(A) To receive an explanation of the measurement procedures;

(B) To observe all steps related to the measurement of airborne concentrations of AN performed at the place of exposure; and

(C) To record the results obtained.

(19) Effective date. This standard will become effective July 28, 1978.

(20) Appendices. The information contained in the appendices is not intended, by itself, to create any additional obligation not otherwise imposed, or to detract from any obligation.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-62-07336, filed 5/11/88.]

WAC 296-62-07337 Appendix A--Substance safety data sheet for acrylonitrile. (1) Substance identification.

(a) Substance: Acrylonitrile (CH₂ CHCN).

(b) Synonyms: Propenenitrile; vinyl cyanide; cyanoethylene; AN; VCN; acylon; carbacryl; fumigrian; ventox.

(c) Acrylonitrile can be found as a liquid or vapor, and can also be found in polymer resins, rubbers, plastics, polyols, and other polymers having acrylonitrile as a raw or intermediate material.

(d) AN is used in the manufacture of acrylic and modiacrylic fibers, acrylic plastics and resins, speciality polymers, nitrile rubbers, and other organic chemicals. It has also been used as a fumigant.

(e) Appearance and odor: Colorless to pale yellow liquid with a pungent odor which can only be detected at concentrations above the permissible exposure level, in a range of 13-19 parts AN per million parts of air (13-19 ppm).

(f) Permissible exposure: Exposure may not exceed either:

(i) Two parts AN per million parts of air (2 ppm) averaged over the eight-hour workday; or

(ii) Ten parts AN per million parts of air (10 ppm) averaged over any fifteen-minute period in the workday.

(iii) In addition, skin and eye contact with liquid AN is prohibited.

(2) Health hazard data.

(a) Acrylonitrile can affect your body if you inhale the vapor (breathing), if it comes in contact with your eyes or skin, or if you swallow it. It may enter your body through your skin.

(b) Effects of overexposure:

(i) Short-term exposure: Acrylonitrile can cause eye irritation, nausea, vomiting, headache, sneezing, weakness, and light-headedness. At high concentrations, the effects of exposure may go on to loss of consciousness and death. When acrylonitrile is held in contact with the skin after being absorbed into shoe leather or clothing, it may produce blisters following several hours of no apparent effect. Unless the shoes or clothing are removed immediately and the area washed, blistering will occur. Usually there is no pain or inflammation associated with blister formation.

(ii) Long-term exposure: Acrylonitrile has been shown to cause cancer in laboratory animals and has been associated with higher incidences of cancer in humans. Repeated or prolonged exposure of the skin to acrylonitrile may produce irritation and dermatitis.

(iii) Reporting signs and symptoms: You should inform your employer if you develop any signs or symptoms and suspect they are caused by exposure to acrylonitrile.

(3) Emergency first aid procedures.

(a) Eye exposure: If acrylonitrile gets into your eyes, wash your eyes immediately with large amounts of water, lifting the lower and upper lids occasionally. Get medical attention immediately. Contact lenses should not be worn when working with this chemical.

(b) Skin exposure: If acrylonitrile gets on your skin, immediately wash the contaminated skin with water. If acrylonitrile soaks through your clothing, especially your shoes, remove the clothing immediately and wash the skin with water. If symptoms occur after washing, get medical attention immediately. Thoroughly wash the clothing before reusing. Contaminated leather shoes or other leather articles should be discarded.

(c) Inhalation: If you or any other person breathes in large amounts of acrylonitrile, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. Keep the affected person warm and at rest. Get medical attention as soon as possible.

(d) Swallowing: When acrylonitrile has been swallowed, give the person large quantities of water immediately. After the water has been swallowed, try to get the person to vomit by having him touch the back of his throat with his finger. Do not make an unconscious person vomit. Get medical attention immediately.

(e) Rescue: Move the affected person from the hazardous exposure. If the exposed person has been overcome, notify someone else and put into effect the established emergency procedures. Do not become a casualty yourself. Understand your emergency rescue procedures and know the location of the emergency equipment before the need arises.

(f) Special first aid procedures: First aid kits containing an adequate supply (at least two dozen) of amyl nitrite pearls, each containing 0.3 ml, should be maintained at each site where acrylonitrile is used. When a person is suspected of receiving an overexposure to acrylonitrile, immediately remove that person from the contaminated area using established rescue procedures. Contaminated clothing must be removed and the acrylonitrile washed from the skin immediately. Artificial respiration should be started at once if breathing has stopped. If the person is unconscious, amyl nitrite may be used as an antidote by a properly trained individual in accordance with established emergency procedures. Medical aid should be obtained immediately.

(4) Respirators and protective clothing.

(a) Respirators:

(i) You may be required to wear a respirator for non-routine activities, in emergencies, while your employer is in the process of reducing acrylonitrile exposures through engineering controls, and in areas where engineering controls are not feasible. If respirators are worn, they must have a Mine Safety and Health Administration (MSHA or MESA) or National Institute for Occupational Safety and Health (NIOSH) label of approval for use with organic vapors. (Older respirators may have a Bureau of Mines approval label.) For effective protection, respirators must fit your face and head snugly. Respirators should not be loosened or removed in work situations where their use is required.

(ii) Acrylonitrile does not have a detectable odor except at levels above the permissible exposure limits. Do not depend on odor to warn you when a respirator cartridge or canister is exhausted. Cartridges or canisters must be changed daily or before the end-of-service-life, whichever comes first. Reuse of these may allow acrylonitrile to gradually filter through the cartridge and cause exposures which you cannot detect by odor. If you can smell acrylonitrile while wearing a respirator, proceed immediately to fresh air. If you experience difficulty breathing while wearing a respirator, tell your employer.

(b) Supplied-air suits: In some work situations, the wearing of supplied-air suits may be necessary. Your employer must instruct you in their proper use and operation.

(c) Protective clothing:

(i) You must wear impervious clothing, gloves, face shield, or other appropriate protective clothing to prevent skin contact with liquid acrylonitrile. Where protective clothing is required, your employer is required to provide clean garments to you as necessary to assume that the clothing protects you adequately.

(ii) Replace or repair impervious clothing that has developed leaks.

(iii) Acrylonitrile should never be allowed to remain on the skin. Clothing and shoes which are not impervious to acrylonitrile should not be allowed to become contaminated with acrylonitrile, and if they do the clothing and shoes should be promptly removed and decontaminated. The clothing should be laundered or discarded after the AN is removed. Once acrylonitrile penetrates shoes or other leather articles, they should not be worn again.

(d) Eye protection: You must wear splashproof safety goggles in areas where liquid acrylonitrile may contact your eyes. In addition, contact lenses should not be worn in areas where eye contact with acrylonitrile can occur.

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

(a) Acrylonitrile is a flammable liquid, and its vapors can easily form explosive mixtures in air.

(b) Acrylonitrile must be stored in tightly closed containers in a cool, well-ventilated area, away from heat, sparks, flames, strong oxidizers (especially bromine), strong bases, copper, copper alloys, ammonia, and amines.

(c) Sources of ignition such as smoking and open flames are prohibited wherever acrylonitrile is handled, used, or stored in a manner that could create a potential fire or explosion hazard.

(d) You should use nonsparking tools when opening or closing metal containers of acrylonitrile, and containers must be bonded and grounded when pouring or transferring liquid acrylonitrile.

(e) You must immediately remove any nonimpervious clothing that becomes wetted with acrylonitrile, and this clothing must not be reworn until the acrylonitrile is removed from the clothing.

(f) Impervious clothing wet with liquid acrylonitrile can be easily ignited. This clothing must be washed down with water before you remove it.

(g) If your skin becomes wet with liquid acrylonitrile, you must promptly and thoroughly wash or shower with soap or mild detergent to remove any acrylonitrile from your skin.

(h) You must not keep food, beverages, or smoking materials, nor are you permitted to eat or smoke in regulated areas where acrylonitrile concentrations are above the permissible exposure limits.

(i) If you contact liquid acrylonitrile, you must wash your hands thoroughly with soap or mild detergent and water before eating, smoking, or using toilet facilities.

(j) Fire extinguishers and quick drenching facilities must be readily available, and you should know where they are and how to operate them.

(k) Ask your supervisor where acrylonitrile is used in your work area and for any additional plant safety and health rules.

(6) Access to information.

(a) Each year, your employer is required to inform you of the information contained in this Substance Safety Data Sheet for acrylonitrile. In addition, your employer must instruct you in the proper work practices for using acrylonitrile, emergency procedures, and the correct use of protective equipment.

(b) Your employer is required to determine whether you are being exposed to acrylonitrile. You or your representative has the right to observe employee measurements and to record the results obtained. Your employer is required to inform you of your exposure. If your employer determines that you are being overexposed, he or she is required to inform you of the actions which are being taken to reduce your exposure to within permissible exposure limits.

(c) Your employer is required to keep records of your exposures and medical examinations. These records must be kept by the employer for at least forty years or for the period of your employment plus twenty years, whichever is longer.

(d) Your employer is required to release your exposure and medical records to you or your representative upon your request.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-62-07337, filed 5/11/88.]

WAC 296-62-07338 Appendix B--Substance technical guidelines for acrylonitrile. (1) Physical and chemical data.

(a) Substance identification:

(i) Synonyms: AN; VCN; vinyl cyanide; propenenitrile; cyanoethylene; Acrylon; Carbacryl; Fumigrain; Ventox.

(ii) Formula: $\text{CH}_2=\text{CHCN}$.

(iii) Molecular weight: 53.1.

(b) Physical data:

(i) Boiling point (760 mm Hg): 77.3°C (171°F);

(ii) Specific gravity (water=1): 0.81 (at 20°C or 68°F);

(iii) Vapor density (air=1 at boiling point of acrylonitrile): 1.83;

(iv) Melting point: -83°C (-117°F);

(v) Vapor pressure (@20°F): 83 mm Hg;

(vi) Solubility in water, percent by weight @20°C (68°F): 7.35;

(vii) Evaporation rate (Butyl Acetate=1): 4.54; and

(viii) Appearance and odor: Colorless to pale yellow liquid with a pungent odor at concentrations above the permissible exposure level. Any detectable odor of acrylonitrile may indicate overexposure.

(2) Fire, explosion, and reactivity hazard data.

(a) Fire:

(i) Flash point: -1°C (30°F) (closed cup).

(ii) Autoignition temperature: 481°C (898°F).

(iii) Flammable limits air, percent by volume: Lower: 3, Upper: 17.

(iv) Extinguishing media: Alcohol foam, carbon dioxide, and dry chemical.

(v) Special fire-fighting procedures: Do not use a solid stream of water, since the stream will scatter and spread the fire. Use water to cool containers exposed to a fire.

(vi) Unusual fire and explosion hazards: Acrylonitrile is a flammable liquid. Its vapors can easily form explosive mixtures with air. All ignition sources must be controlled where acrylonitrile is handled, used, or stored in a manner that could create a potential fire or explosion hazard. Acrylonitrile vapors are heavier than air and may travel along the ground and be ignited by open flames or sparks at locations remote from the site at which acrylonitrile is being handled.

(vii) For purposes of compliance with the requirements of WAC 296-24-330, acrylonitrile is classified as a class IB flammable liquid. For example, 7,500 ppm, approximately one-fourth of the lower flammable limit, would be considered to pose a potential fire and explosion hazard.

(viii) For purposes of compliance with WAC 296-24-59207, acrylonitrile is classified as a Class B fire hazard.

(ix) For purpose of compliance with WAC 296-24-95613, locations classified as hazardous due to the presence of acrylonitrile shall be Class I, Group D.

(b) Reactivity:

(i) Conditions contributing to instability: Acrylonitrile will polymerize when hot, and the additional heat liberated by the polymerization may cause containers to explode. Pure AN may self-polymerize, with a rapid build-up of pressure, resulting in an explosion hazard. Inhibitors are added to the commercial product to prevent self-polymerization.

(ii) Incompatibilities: Contact with strong oxidizers (especially bromine) and strong bases may cause fires and explosions. Contact with copper, copper alloys, ammonia, and amines may start serious decomposition.

(iii) Hazardous decomposition products: Toxic gases and vapors (such as hydrogen cyanide, oxides of nitrogen, and carbon monoxide) may be released in a fire involving acrylonitrile and certain polymers made from acrylonitrile.

(iv) Special precautions: Liquid acrylonitrile will attack some forms of plastics, rubbers, and coatings.

(3) Spill, leak, and disposal procedures.

(a) If acrylonitrile is spilled or leaked, the following steps should be taken:

(i) Remove all ignition sources.

(ii) The area should be evacuated at once and re-entered only after the area has been thoroughly ventilated and washed down with water.

(iii) If liquid acrylonitrile or polymer intermediate, collect for reclamation or absorb in paper, vermiculite, dry sand, earth, or similar material, or wash down with water into process sewer system.

(b) Persons not wearing protective equipment should be restricted from areas of spills or leaks until clean-up has been completed.

(c) Waste disposal methods: Waste materials shall be disposed of in a manner that is not hazardous to employees or to the general population. Spills of acrylonitrile and flushing of such spills shall be channeled for appropriate treatment or collection for disposal. They shall not be channeled directly into the sanitary sewer system. In selecting the method of waste disposal, applicable local, state, and federal regulations should be consulted.

(4) Monitoring and measurement procedures.

(a) Exposure above the permissible exposure limit:

(i) Eight-hour exposure evaluation: Measurements taken for the purpose of determining employee exposure under this section are best taken so that the average eight-hour exposure may be determined from a single eight-hour sample or two four-hour samples. Air samples should be taken in the employee's breathing zone (air that would most nearly represent that inhaled by the employee).

(ii) Ceiling evaluation: Measurements taken for the purpose of determining employee exposure under this section must be taken during periods of maximum expected airborne concentrations of acrylonitrile in the employee's breathing zone. A minimum of three measurements should be taken on one work shift. The average of all measurements taken is an estimate of the employee's ceiling exposure.

(iii) Monitoring techniques: The sampling and analysis under this section may be performed by collecting the acrylonitrile vapor on charcoal adsorption tubes or other composition adsorption tubes, with subsequent chemical analysis. Sampling and analysis may also be performed by instruments such as real-time continuous monitoring systems, portable direct-reading instruments, or passive dosimeters. Analysis of resultant samples should be by gas chromatograph.

(iv) Appendix D lists methods of sampling and analysis which have been tested by NIOSH and OSHA for use with acrylonitrile. NIOSH and OSHA have validated modifications of NIOSH Method S-156 (see Appendix D) under laboratory conditions for concentrations below 1 ppm. The employer has the obligation of selecting a monitoring method which meets the accuracy and precision requirements of the standard under his/her unique field conditions. The standard requires that methods of monitoring must be accurate, to a 95-percent confidence level, to ± 35 -percent for concentrations of AN at or above 2 ppm, and to ± 50 -percent for concentrations below 2 ppm. In addition to the methods described in Appendix D, there are numerous other

methods available for monitoring for AN in the workplace. Details on these other methods have been submitted by various companies to the rulemaking record, and are available at the OSHA Docket Office.

(b) Since many of the duties relating to employee exposure are dependent on the results of monitoring and measuring procedures, employers shall assure that the evaluation of employee exposures is performed by a competent industrial hygienist or other technically qualified person.

(5) Protective clothing.

(a) Employees shall be provided with and required to wear appropriate protective clothing to prevent any possibility of skin contact with liquid AN. Because acrylonitrile is absorbed through the skin, it is important to prevent skin contact with liquid AN. Protective clothing shall include impermeable coveralls or similar full-body work clothing, gloves, head-coverings, as appropriate to protect areas of the body which may come in contact with liquid AN.

(b) Employers should ascertain that the protective garments are impermeable to acrylonitrile. Nonimpermeable clothing and shoes should not be allowed to become contaminated with liquid AN. If permeable clothing does become contaminated, it should be promptly removed, placed in a regulated area for removal of the AN, and not worn again until the AN is removed. If leather footwear or other leather garments become wet from acrylonitrile, they should be replaced and not worn again, due to the ability of leather to absorb acrylonitrile and hold it against the skin. Since there is no pain associated with the blistering which may result from skin contact with liquid AN, it is essential that the employee be informed of this hazard so that he or she can be protected.

(c) Any protective clothing which has developed leaks or is otherwise found to be defective shall be repaired or replaced. Clean protective clothing shall be provided to the employee as necessary to assure its protectiveness. Whenever impervious clothing becomes wet with liquid AN, it shall be washed down with water before being removed by the employee. Employees are also required to wear splash-proof safety goggles where there is any possibility of acrylonitrile contacting the eyes.

(6) Housekeeping and hygiene facilities. For purposes of complying with WAC 296-24-120, the following items should be emphasized:

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

(b) Dry sweeping and the use of compressed air is unsafe for the cleaning of floors and other surfaces where liquid AN may be found.

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

(d) Change or dressing rooms with individual clothes storage facilities must be provided to prevent the contamination of street clothes with acrylonitrile. Because of the hazardous nature of acrylonitrile, contaminated protective clothing should be placed in a regulated area designated by the employer for removal of the AN before the clothing is laundered or disposed of.

(7) Miscellaneous precautions.

(a) Store acrylonitrile in tightly-closed containers in a cool, well-ventilated area and take necessary precautions to avoid any explosion hazard.

(b) High exposures to acrylonitrile can occur when transferring the liquid from one container to another.

(c) Nonsparking tools must be used to open and close metal acrylonitrile containers. These containers must be effectively grounded and bonded prior to pouring.

(d) Never store uninhibited acrylonitrile.

(e) Acrylonitrile vapors are not inhibited. They may form polymers and clog vents of storage tanks.

(f) Use of supplied-air suits or other impervious coverings may be necessary to prevent skin contact with and provide respiratory protection from acrylonitrile where the concentration of acrylonitrile is unknown or is above the ceiling limit. Supplied-air suits should be selected, used, and maintained under the immediate supervision of persons knowledgeable in the limitations and potential life-endangering characteristics of supplied-air suits.

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

(8) Common operations. Common operations in which exposure to acrylonitrile is likely to occur include the following: Manufacture of the acrylonitrile monomer; synthesis of acrylic fibers, ABS, SAN, and nitrile barrier plastics and resins, nitrile rubber, surface coatings, specialty chemicals; use as a chemical intermediate; use as a fumigant; and in the cyanoethylation of cotton.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-62-07338, filed 5/11/88.]

WAC 296-62-07339 Appendix C--Medical surveillance guidelines for acrylonitrile. (1) Route of entry.

- (a) Inhalation;
 - (b) Skin absorption;
 - (c) Ingestion.
- (2) Toxicology.

(a) Acrylonitrile vapor is an asphyxiant due to inhibitory action on metabolic enzyme systems. Animals exposed to 75 or 100 ppm for seven hours have shown signs of anoxia; in some animals which died at the higher level, cyanomethemoglobin was found in the blood. Two human fatalities from accidental poisoning have been reported; one was caused by inhalation of an unknown concentration of the vapor, and the other was thought to be caused by skin absorption or inhalation. Most cases of intoxication from industrial exposure have been mild, with rapid onset of eye irritation, headache, sneezing, and nausea. Weakness, lightheadedness, and vomiting may also occur. Exposure to high concentrations may produce profound weakness, asphyxia, and death. The vapor is a severe eye irritant. Prolonged skin

contract with the liquid may result in absorption with systemic effects, and in the formation of large blisters after a latent period of several hours. Although there is usually little or no pain or inflammation, the affected skin resembles a second-degree thermal burn. Solutions spilled on exposed skin, or on areas covered only by a light layer of clothing, evaporate rapidly, leaving no irritation, or, at the most, mild transient redness. Repeated spills on exposed skin may result in dermatitis due to solvent effects.

(b) Results after one year of a planned two-year animal study on the effects of exposure to acrylonitrile have indicated that rats ingesting as little as 35 ppm in their drinking water develop tumors of the central nervous system. The interim results of this study have been supported by a similar study being conducted by the same laboratory, involving exposure of rats by inhalation of acrylonitrile vapor, which has shown similar types of tumors in animals exposed to 80 ppm.

(c) In addition, the preliminary results of an epidemiological study being performed by duPont on a cohort of workers in their Camden, S.C. acrylic fiber plant indicate a statistically significant increase in the incidence of colon and lung cancers among employees exposed to acrylonitrile.

(3) Signs and symptoms of acute overexposure. Asphyxia and death can occur from exposure to high concentrations of acrylonitrile. Symptoms of overexposure include eye irritation, headache, sneezing, nausea and vomiting, weakness, and light-headedness. Prolonged skin contact can cause blisters on the skin with appearance of a second-degree burn, but with little or no pain. Repeated skin contact may produce scaling dermatitis.

(4) Treatment of acute overexposure. Remove employee from exposure. Immediately flush eyes with water and wash skin with soap or mild detergent and water. If AN has been swallowed, and person is conscious, induce vomiting. Give artificial respiration if indicated. More severe cases, such as those associated with loss of consciousness, may be treated by the intravenous administration of sodium nitrite, followed by sodium thiosulfate, although this is not as effective for acrylonitrile poisoning as for inorganic cyanide poisoning.

(5) Surveillance and preventive considerations.

(a) As noted above, exposure to acrylonitrile has been linked to increased incidence of cancers of the colon and lung in employees of the duPont acrylic fiber plant in Camden, S.C. In addition, the animal testing of acrylonitrile has resulted in the development of cancers of the central nervous system in rats exposed by either inhalation or ingestion. The physician should be aware of the findings of these studies in evaluating the health of employees exposed to acrylonitrile.

(b) Most reported acute effects of occupational exposure to acrylonitrile are due to its ability to cause tissue anoxia and asphyxia. The effects are similar to those caused by hydrogen cyanide. Liquid acrylonitrile can be absorbed through the skin upon prolonged contact. The liquid readily penetrates leather, and will produce burns of the feet if footwear contaminated with acrylonitrile is not removed.

(c) It is important for the physician to become familiar with the operating conditions in which exposure to acrylonitrile may occur. Those employees with skin diseases may not tolerate the wearing of whatever protective clothing may be necessary to protect them from exposure. In addition, those with chronic respiratory disease may not tolerate the wearing of negative-pressure respirators.

(d) Surveillance and screening. Medical histories and laboratory examinations are required for each employee subject to exposure to acrylonitrile above the action level. The employer must screen employees for history of certain medical conditions which might place the employee at increased risk from exposure.

(i) Central nervous system dysfunction. Acute effects of exposure to acrylonitrile generally involve the central nervous system. Symptoms of acrylonitrile exposure include headache, nausea, dizziness, and general weakness. The animal studies cited above suggest possible carcinogenic effects of acrylonitrile on the central nervous system, since rats exposed by either inhalation or ingestion have developed similar CNS tumors.

(ii) Respiratory disease. The duPont data indicate an increased risk of lung cancer among employees exposed to acrylonitrile.

(iii) Gastrointestinal disease. The duPont data indicate an increased risk of cancer of the colon among employees exposed to acrylonitrile. In addition, the animal studies show possible tumor production in the stomachs of the rats in the ingestion study.

(iv) Skin disease. Acrylonitrile can cause skin burns when prolonged skin contact with the liquid occurs. In addition, repeated skin contact with the liquid can cause dermatitis.

(e) General. The purpose of the medical procedures outlined in the standard is to establish a baseline for future health monitoring. Persons unusually susceptible to the effects of anoxia or those with anemia would be expected to be at increased risk. In addition to emphasis on the CNS, respiratory and gastro-intestinal systems, the cardiovascular system, liver, and kidney function should also be stressed.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-62-07339, filed 5/11/88.]

WAC 296-62-07340 Appendix D--Sampling and analytical methods for acrylonitrile. (1) There are many methods available for monitoring employee exposures to acrylonitrile. Most of these involve the use of charcoal tubes and sampling pumps, with analysis by gas chromatograph. The essential differences between the charcoal tube methods include, among others, the use of different desorbing solvents, the use of different lots of charcoal, and the use of different equipment for analysis of the samples.

(2) Besides charcoal, considerable work has been performed on methods using porous polymer sampling tubes and passive dosimeters. In addition, there are several portable gas analyzers and monitoring units available on the open market.

(3) This appendix contains details for the methods which have been tested at OSHA Analytical Laboratory in Salt Lake City, and NIOSH in Cincinnati. Each is a variation on NIOSH Method S-156, which is also included for reference. This does not indicate that these methods are the only ones which will be satisfactory. There also may be workplace situations in which these methods are not adequate, due to such factors as high humidity. Copies of the other methods available to OSHA are available in the rulemaking record, and may be obtained from the OSHA docket office. These include, the Union Carbide, Monsanto, Dow Chemical and Dow Badische methods, as well as NIOSH Method P & CAM 127.

(4) Employers who note problems with sample breakthrough should try larger charcoal tubes. Tubes of larger capacity are available, and are often used for sampling vinyl chloride. In addition, lower flow rates and shorter sampling times should be beneficial in minimizing breakthrough problems.

(5) Whatever method the employer chooses, he must assure himself of the method's accuracy and precision under the unique conditions present in his workplace.

(6) NIOSH Method S-156 (unmodified)

Analyte: Acrylonitrile.

Matrix: Air.

Procedure: Absorption on charcoal, desorption with methanol, GC.

(a) Principle of the method. Reference (k)(i) of this subsection.

(i) A known volume of air is drawn through a charcoal tube to trap the organic vapors present.

(ii) The charcoal in the tube is transferred to a small, stoppered sample container, and the analyte is desorbed with methanol.

(iii) An aliquot of the desorbed sample is injected into a gas chromatograph.

(iv) The area of the resulting peak is determined and compared with areas obtained for standards.

(b) Range and sensitivity.

(i) This method was validated over the range of 17.5-70.0 mg/cu m at an atmospheric temperature and pressure of 22°C and 760 mm Hg, using a twenty-liter sample. Under the conditions of sample size (20 liters) the probable useful range of this method is 4.5-135 mg/cu m. The method is capable of measuring much smaller amounts if the desorption efficiency is adequate. Desorption efficiency must be determined over the range used.

(ii) The upper limit of the range of the method is dependent on the adsorptive capacity of the charcoal tube. This capacity varies with the concentrations of acrylonitrile and other substances in the air. The first section of the charcoal tube was found to hold at least 3.97 mg of acrylonitrile when a test atmosphere containing 92.0 mg/cu m of acrylonitrile in air was sampled 0.18 liter per minute for 240 minutes; at that time the concentration of acrylonitrile in the effluent was less than 5 percent of that in the influent. (The charcoal tube consists of two sections of activated charcoal separated by a section of urethane foam. See (f)(ii) of this subsection. If a

particular atmosphere is suspected of containing a large amount of contaminant, a smaller sampling volume should be taken.

(c) Interference.

(i) When the amount of water in the air is so great that condensation actually occurs in the tube, organic vapors will not be trapped efficiently. Preliminary experiments using toluene indicate that high humidity severely decreases the breakthrough volume.

(ii) When interfering compounds are known or suspected to be present in the air, such information, including their suspected identities, should be transmitted with the sample.

(iii) It must be emphasized that any compound which has the same retention time as the analyte at the operating conditions described in this method is an interference. Retention time data on a single column cannot be considered proof of chemical identity.

(iv) If the possibility of interference exists, separation conditions (column packing, temperature, etc.) must be changed to circumvent the problem.

(d) Precision and accuracy.

(i) The coefficient of variation (CV_i) for the total analytical and sampling method in the range of 17.5-70.0 mg/cu m was 0.073. This value corresponds to a 3.3 mg/cu m standard deviation at the (previous) OSHA standard level (20 ppm). Statistical information and details of the validation and experimental test procedures can be found in (k)(ii) of this subsection.

(ii) On the average the concentrations obtained at the 20 ppm level using the overall sampling and analytical method were 6.0 percent lower than the "true" concentrations for a limited number of laboratory experiments. Any difference between the "found" and "true" concentrations may not represent a bias in the sampling and analytical method, but rather a random variation from the experimentally determined "true" concentration. Therefore, no recovery correction should be applied to the final result in (j)(v) of this subsection.

(e) Advantages and disadvantages of the method.

(i) The sampling device is small, portable, and involves no liquids. Interferences are minimal, and most of those which do occur can be eliminated by altering chromatographic conditions. The tubes are analyzed by means of a quick, instrumental method.

(ii) The method can also be used for the simultaneous analysis of two or more substances suspected to be present in the same sample by simply changing gas chromatographic conditions.

(iii) One disadvantage of the method is that the amount of sample which can be taken is limited by the number of milligrams that the tube will hold before overloading. When the sample value obtained for the backup section of the charcoal tube exceeds 25 percent of that found on the front section, the possibility of sample loss exists.

(iv) Furthermore, the precision of the method is limited by the reproducibility of the pressure drop across the tubes. This drop will affect the flow rate and cause the volume to be imprecise, because the pump is usually calibrated for one tube only.

(f) Apparatus.

(i) A calibrated personal sampling pump whose flow can be determined within ± 5 percent at the recommended flow rate. Reference (k)(iii) of this subsection.

(ii) Charcoal tubes: Glass tubes with both ends flame sealed, 7 cm long with a 6 mm O.D. and a 4 mm I.D., containing 2 sections of 20/40 mesh activated charcoal separated by a 2 mm portion of urethane foam. The activated charcoal is prepared from coconut shells and is fired at 600°C prior to packing. The adsorbing section contains 100 mg of charcoal, the backup section 50 mg. A 3 mm portion of urethane foam is placed between the outlet end of the tube and the backup section. A plug of silicated glass wool is placed in front of the adsorbing section. The pressure drop across the tube must be less than 1 inch of mercury at a flow rate of 1 liter per minute.

(iii) Gas chromatograph equipped with a flame ionization detector.

(iv) Column (4 ft \times 1/4 in stainless steel) packed with 50/80 mesh Poropak, type Q.

(v) An electronic integrator or some other suitable method for measuring peak areas.

(vi) Two-milliliter sample containers with glass stoppers or Teflon-lined caps. If an automatic sample injector is used, the associated vials may be used.

(vii) Microliter syringes: Ten-microliter and other convenient sizes for making standards.

(viii) Pipets: 1.0 ml delivery pipets.

(ix) Volumetric flask: 10 ml or convenient sizes for making standard solutions.

(g) Reagents.

(i) Chromatographic quality methanol.

(ii) Acrylonitrile, reagent grade.

(iii) Hexane, reagent grade.

(iv) Purified nitrogen.

(v) Prepurified hydrogen.

(vi) Filtered compressed air.

(h) Procedure.

(i) Cleaning of equipment. All glassware used for the laboratory analysis should be detergent washed and thoroughly rinsed with tap water and distilled water.

(ii) Calibration of personal pumps. Each personal pump must be calibrated with a representative charcoal tube in the line. This will minimize errors associated with uncertainties in the sample volume collected.

(iii) Collection and shipping of samples.

(A) Immediately before sampling, break the ends of the tube to provide an opening at least one-half the internal diameter of the tube (2mm).

(B) The smaller section of charcoal is used as a backup and should be positioned nearest the sampling pump.

(C) The charcoal tube should be placed in a vertical direction during sampling to minimize channeling through the charcoal.

(D) Air being sampled should not be passed through any hose or tubing before entering the charcoal tube.

(E) A maximum sample size of 20 liters is recommended. Sample at a flow of 0.20 liter per minute or

less. The flow rate should be known with an accuracy of at least ± 5 percent.

(F) The temperature and pressure of the atmosphere being sampled should be recorded. If pressure reading is not available, record the elevation.

(G) The charcoal tubes should be capped with the supplied plastic caps immediately after sampling. Under no circumstances should rubber caps be used.

(H) With each batch of ten samples submit one tube from the same lot of tubes which was used for sample collection and which is subjected to exactly the same handling as the samples except that no air is drawn through it. Label this as a blank.

(I) Capped tubes should be packed tightly and padded before they are shipped to minimize tube breakage during shipping.

(J) A sample of the bulk material should be submitted to the laboratory in a glass container with a Teflon-lined cap. This sample should not be transported in the same container as the charcoal tubes.

(iv) Analysis of samples.

(A) Preparation of samples. In preparation for analysis, each charcoal tube is scored with a file in front of the first section of charcoal and broken open. The glass wool is removed and discarded. The charcoal in the first (larger) section is transferred to a 2 ml stoppered sample container. The separating section of foam is removed and discarded; the second section is transferred to another stoppered container. These two sections are analyzed separately.

(B) Desorption of samples. Prior to analysis, 1.0 ml of methanol is pipetted into each sample container. Desorption should be done for 30 minutes. Tests indicate that this is adequate if the sample is agitated occasionally during this period. If an automatic sample injector is used, the sample vials should be capped as soon as the solvent is added to minimize volatilization.

(C) GC conditions. The typical operating conditions for the gas chromatograph are:

(I) 50 ml/min (60 psig) nitrogen carrier gas flow.

(II) 65 ml/min (24 psig) hydrogen gas flow to detector.

(III) 500 ml/min (50 psig) air flow to detector.

(IV) 235°C injector temperature.

(V) 255°C manifold temperature (detector).

(VI) 155°C column temperature.

(D) Injection. The first step in the analysis is the injection of the sample into the gas chromatograph. To eliminate difficulties arising from blowback or distillation within the syringe needle, one should employ the solvent flush injection technique. The 10-microliter syringe is first flushed with solvent several times to wet the barrel and plunger. Three microliters of solvent are drawn into the syringe to increase the accuracy and reproducibility of the injected sample volume. The needle is removed from the solvent, and the plunger is pulled back about 0.2 microliter to separate the solvent flush from the sample with a pocket of air to be used as a marker. The needle is then immersed in the sample, and a five microliter aliquot is withdrawn, taking into consideration the volume of the needle, since the sample in

the needle will be completely injected. After the needle is removed from the sample and prior to injection, the plunger is pulled back 1.2 microliters to minimize evaporation of the sample from the tip of the needle. Observe that the sample occupies 4.9–5.0 microliters in the barrel of the syringe. Duplicate injections of each sample and standard should be made. No more than a 3 percent difference in area is to be expected. An automatic sample injector can be used if it is shown to give reproducibility at least as good as the solvent flush method.

(E) Measurement of area. The area of the sample peak is measured by an electronic integrator or some other suitable form of area measurement, and preliminary results are read from a standard curve prepared as discussed below.

(v) Determination of desorption efficiency.

(A) Importance of determination. The desorption efficiency of a particular compound can vary from one laboratory to another and also from one batch of charcoal to another. Thus, it is necessary to determine at least once the percentage of the specific compound that is removed in the desorption process, provided the same batch of charcoal is used.

(B) Procedure for determining desorption efficiency.

(I) Activated charcoal equivalent to the amount in the first section of the sampling tube (100 mg) is measured into a 2.5 in., 4 mm I.D. glass tube, flame sealed at one end. This charcoal must be from the same batch as that used in obtaining the samples and can be obtained from unused charcoal tubes. The open end is capped with Parafilm. A known amount of hexane solution of acrylonitrile containing 0.239 g/ml is injected directly into the activated charcoal with a microliter syringe, and tube is capped with more Parafilm. When using an automatic sample injector, the sample injector vials, capped with Teflon-faced septa, may be used in place of the glass tube.

(II) The amount injected is equivalent to that present in a twenty-liter air sample at the selected level.

(III) Six tubes at each of three levels (0.5X, 1X, and 2X of the standard) are prepared in this manner and allowed to stand for at least overnight to assure complete adsorption of the analyte onto the charcoal. These tubes are referred to as the sample. A parallel blank tube should be treated in the same manner except that no sample is added to it. The sample and blank tubes are desorbed and analyzed in exactly the same manner as the sampling tube described in (h)(iv) of this subsection.

(IV) Two or three standards are prepared by injecting the same volume of compound into 1.0 ml of methanol with the same syringe used in the preparation of the samples. These are analyzed with the samples.

(V) The desorption efficiency (D.E.) equals the average weight in mg recovered from the tube divided by the weight in mg added to the tube, or

$$\text{D.E.} = \frac{\text{Average weight recovered (mg)}}{\text{weight added (mg)}}$$

(VI) The desorption efficiency is dependent on the amount of analyte collected on the charcoal. Plot the

desorption efficiency versus weight of analyte found. This curve is used in (j)(iv) of this subsection to correct for adsorption losses.

(i) Calibration and standards. It is convenient to express concentration of standards in terms of mg/1.0 ml methanol, because samples are desorbed in this amount of methanol. The density of the analyte is used to convert mg into microliters for easy measurement with a microliter syringe. A series of standards, varying in concentration over the range of interest, is prepared and analyzed under the same GC conditions and during the same time period as the unknown samples. Curves are established by plotting concentration in mg/1.0 ml versus peak area.

Note: Since no internal standard is used in the method, standard solutions must be analyzed at the same time that the sample analysis is done. This will minimize the effect of known day-to-day variations and variations during the same day of the FID response.

(j) Calculations.

(i) Read the weight, in mg, corresponding to each peak area from the standard curve. No volume corrections are needed, because the standard curve is based on mg/1.0 ml methanol and the volume of sample injected is identical to the volume of the standards injected.

(ii) Corrections for the blank must be made for each sample.

$$\text{mg} = \text{mg sample} - \text{mg blank}$$

Where:

mg sample = mg found in front section of sample tube.
mg sample = mg found in front section of blank tube.

Note: A similar procedure is followed for the backup sections.

(iii) Add the weights found in the front and backup sections to get the total weight in the sample.

(iv) Read the desorption efficiency from the curve (reference (h)(v)(B) of this subsection) for the amount found in the front section. Divide the total weight by this desorption efficiency to obtain the corrected mg/sample.

$$\text{Corrected mg/sample} = \frac{\text{Total weight}}{\text{D.E.}}$$

(v) The concentration of the analyte in the air sampled can be expressed in mg/cu m.

$$\text{mg/cu m} = \text{Corrected mg (see (j)(iv))} \times \frac{1,000 \text{ (liter/cu m)}}{\text{air volume sampled (liter)}}$$

(vi) Another method of expressing concentration is ppm.

$$\text{ppm} = \text{mg/cu m} \times 24.45/\text{M.W.} \times 760/\text{P} \times \text{T} + 273/298$$

Where:

P = Pressure (mm Hg) of air sampled.

T = Temperature (°C) of air sampled.

24.45 = Molar volume (liter/mole) at 25°C and 760 mm Hg.

M.W. = Molecular weight (g/mole) of analyte.

760 = Standard pressure (mm Hg).

298 = Standard temperature (°K).

(k) References.

(i) White, L. D. et al., "A Convenient Optimized Method for the Analysis of Selected Solvent Vapors in the Industrial Atmosphere,"

Amer. Ind. Hyg. Assoc. J., 31:225 (1970).

(ii) Documentation of NIOSH Validation Tests, NIOSH Contract No. CDC-99-74-45.

(iii) Final Report, NIOSH Contract HSM-99-71-31, "Personal Sampler Pump for Charcoal Tubes," September 15, 1972.

(7) NIOSH Modification of NIOSH Method S-156. The NIOSH recommended method for low levels for acrylonitrile is a modification of method S-156. It differs in the following respects:

(a) Samples are desorbed using 1 ml of 1 percent acetone in CS₂ rather than methanol.

(b) The analytical column and conditions are:

(i) Column: 20 percent SP-1000 on 80/100 Supelcoport 10 feet × 1/8 inch S.S.

(ii) Conditions:

Injector temperature: 200°C.

Detector temperature: 100°C.

Column temperature: 85°C.

Helium flow: 25 ml/min.

Air flow: 450 ml/min.

Hydrogen flow: 55 ml/min.

(c) A 2 µl injection of the desorbed analyte is used.

(d) A sampling rate of 100 ml/min is recommended.

(8) OSHA Laboratory Modification of NIOSH Method S-156.

(a) Analyte: Acrylonitrile.

(b) Matrix: Air.

(c) Procedure: Adsorption on charcoal, desorption with methanol, GC.

(d) Principle of the method (subsection (1)(a) of this section).

(i) A known volume of air is drawn through a charcoal tube to trap the organic vapors present.

(ii) The charcoal in the tube is transferred to a small, stoppered sample vial, and the analyte is desorbed with methanol.

(iii) An aliquot of the desorbed sample is injected into a gas chromatograph.

(iv) The area of the resulting peak is determined and compared with areas obtained for standards.

(e) Advantages and disadvantages of the method.

(i) The sampling device is small, portable, and involves no liquids. Interferences are minimal, and most of those which do occur can be eliminated by altering chromatographic conditions. The tubes are analyzed by means of a quick, instrumental method.

(ii) This method may not be adequate for the simultaneous analysis of two or more substances.

(iii) The amount of sample which can be taken is limited by the number of milligrams that the tube will hold before overloading. When the sample value obtained for the backup section of the charcoal tube exceeds 25 percent of that found on the front section, the possibility of sample loss exists.

(iv) The precision of the method is limited by the reproducibility of the pressure drop across the tubes. This

drop will affect the flow rate and cause the volume to be imprecise, because the pump is usually calibrated for one tube only.

(f) Apparatus.

(i) A calibrated personal sampling pump whose flow can be determined within ±5 percent at the recommended flow rate.

(ii) Charcoal tubes: Glass tube with both ends flame sealed, 7 cm long with a 6 mm O.D. and a 4 mm I.D., containing 2 sections of 20/40 mesh activated charcoal separated by a 2 mm portion of urethane foam. The activated charcoal is prepared from coconut shells and is fired at 600°C prior to packing. The absorbing section contains 100 mg of charcoal, the back-up section 50 mg. A 3 mm portion of urethane foam is placed between the outlet end of the tube and the back-up section. A plug of silitated glass wool is placed in front of the adsorbing section. The pressure drop across the tube must be less than one inch of mercury at a flow rate of 1 liter per minute.

(iii) Gas chromatograph equipped with a nitrogen phosphorus detector.

(iv) Column (10 ft × 1/8 in stainless steel) packed with 100/120 Supelcoport coated with 10 percent SP 1000.

(v) An electronic integrator or some other suitable method for measuring peak area.

(vi) Two-milliliter sample vials with Teflon-lined caps.

(vii) Microliter syringes: 10 microliter, and other convenient sizes for making standards.

(viii) Pipets: 1.0 ml delivery pipets.

(ix) Volumetric flasks: convenient sizes for making standard solutions.

(g) Reagents.

(i) Chromatographic quality methanol.

(ii) Acrylonitrile, reagent grade.

(iii) Filtered compressed air.

(iv) Purified hydrogen.

(v) Purified helium.

(h) Procedure.

(i) Cleaning of equipment. All glassware used for the laboratory analysis should be properly cleaned and free of organics which could interfere in the analysis.

(ii) Calibration of personal pumps. Each pump must be calibrated with a representative charcoal tube in the line.

(iii) Collection and shipping of samples.

(A) Immediately before sampling, break the ends of the tube to provide an opening at least one-half the internal diameter of the tube (2 mm).

(B) The smaller section of the charcoal is used as the backup and should be placed nearest the sampling pump.

(C) The charcoal should be placed in a vertical position during sampling to minimize channeling through the charcoal.

(D) Air being sampled should not be passed through any hose or tubing before entering the charcoal tube.

(E) A sample size of 20 liters is recommended. Sample at a flow rate of approximately 0.2 liters per minute.

The flow rate should be known with an accuracy of at least ± 5 percent.

(F) The temperature and pressure of the atmosphere being sampled should be recorded.

(G) The charcoal tubes should be capped with the supplied plastic caps immediately after sampling. Rubber caps should not be used.

(H) Submit at least one blank tube (a charcoal tube subjected to the same handling procedures, without having any air drawn through it) with each set of samples.

(I) Take necessary shipping and packing precautions to minimize breakage of samples.

(iv) Analysis of samples.

(A) Preparation of samples. In preparation for analysis, each charcoal tube is scored with a file in front of the first section of charcoal and broken open. The glass wool is removed and discarded. The charcoal in the first (larger) section is transferred to a 2 ml vial. The separating section of foam is removed and discarded; the section is transferred to another capped vial. These two sections are analyzed separately.

(B) Desorption of samples. Prior to analysis, 1.0 ml of methanol is pipetted into each sample container. Desorption should be done for 30 minutes in an ultrasonic bath. The sample vials are recapped as soon as the solvent is added.

(C) GC conditions. The typical operating conditions for the gas chromatograph are:

(I) 30 ml/min (60 psig) helium carrier gas flow.

(II) 3.0 ml/min (30 psig) hydrogen gas flow to detector.

(III) 50 ml/min (60 psig) air flow to detector.

(IV) 200°C injector temperature.

(V) 200°C dejector temperature.

(VI) 100°C column temperature.

(D) Injection. Solvent flush technique or equivalent.

(E) Measurement of area. The area of the sample peak is measured by an electronic integrator or some other suitable form of area measurement, and preliminary results are read from a standard curve prepared as discussed below.

(v) Determination of desorption efficiency.

(A) Importance of determination. The desorption efficiency of a particular compound can vary from one laboratory to another and also from one batch of charcoal to another. Thus, it is necessary to determine, at least once, the percentage of the specific compound that is removed in the desorption process, provided the same batch of charcoal is used.

(B) Procedure for determining desorption efficiency. The reference portion of the charcoal tube is removed. To the remaining portion, amounts representing 0.5X, 1X, and 2X (X represents TLV) based on a 20 l air sample are injected onto several tubes at each level. Dilutions of acrylonitrile with methanol are made to allow injection of measurable quantities. These tubes are then allowed to equilibrate at least overnight. Following equilibration they are analyzed following the same procedure as the samples. A curve of the desorption efficiency (amt recovered/amt added) is plotted versus

amount of analyte found. This curve is used to correct for adsorption losses.

(i) Calibration and standards. A series of standards, varying in concentration over the range of interest, is prepared and analyzed under the same GC conditions and during the same time period as the unknown samples. Curves are prepared by plotting concentration versus peak area.

Note: Since no internal standard is used in the method, standard solutions must be analyzed at the same time that the sample analysis is done. This will minimize the effect of known day-to-day variations and variations during the same day of the NPD response. Multiple injections are necessary.

(j) Calculations. Read the weight, corresponding to each peak area from the standard curve, correct for the blank, correct for the desorption efficiency, and make necessary air volume corrections.

(k) Reference. NIOSH Method S-156.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-62-07340, filed 5/11/88.]

WAC 296-62-07341 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-62-07342 1,2-Dibromo-3-chloropropane. (1) Scope and application.

(a) This section applies to occupational exposure to 1,2-dibromo-3-chloropropane (DBCP).

(b) This section does not apply to:

(i) Exposure to DBCP which results solely from the application and use of DBCP as a pesticide; or

(ii) The storage, transportation, distribution or sale of DBCP in intact containers sealed in such a manner as to prevent exposure to DBCP vapors or liquids, except for the requirements of subsections (11), (16) and (17) of this section.

(2) Definitions applicable to this section:

(a) "Authorized person" - any person specifically authorized by the employer and whose duties require the person to be present in areas where DBCP is present; and any person entering this area as a designated representative of employees exercising an opportunity to observe employee exposure monitoring.

(b) "DBCP" - 1,2-dibromo-3-chloropropane, Chemical Abstracts Service Registry Number 96-12-8, and includes all forms of DBCP.

(c) "Director" - the director of labor and industries, or his authorized representative.

(d) "Emergency" - any occurrence such as, but not limited to equipment failure, rupture of containers, or failure of control equipment which may, or does, result in unexpected release of DBCP.

(3) Permissible exposure limits.

(a) Inhalation.

(i) Time-weighted average limit (TWA). The employer shall assure that no employee is exposed to an airborne concentration in excess of 1 part DBCP per billion part of air (ppb) as an eight-hour time-weighted average.

(ii) Ceiling limit. The employer shall assure that no employee is exposed to an airborne concentration in excess of 5 parts DBCP per billion parts of air (ppb) as averaged over any 15 minutes during the working day.

(b) Dermal and eye exposure. The employer shall assure that no employee is exposed to eye or skin contact with DBCP.

(4) Notification of use. Within ten days of the effective date of this section or within ten days following the introduction of DBCP into the workplace, every employer who has a workplace where DBCP is present shall report the following information to the director for each such workplace:

(a) The address and location of each workplace in which DBCP is present;

(b) A brief description of each process or operation which may result in employee exposure to DBCP;

(c) The number of employees engaged in each process or operation who may be exposed to DBCP and an estimate of the frequency and degree of exposure that occurs;

(d) A brief description of the employer's safety and health program as it relates to limitation of employee exposure to DBCP.

(5) Regulated areas. The employer shall establish, within each place of employment, regulated areas wherever DBCP concentrations are in excess of the permissible exposure limit.

(a) The employer shall limit access to regulated areas to authorized persons.

(b) All employees entering or working in a regulated area shall wear respiratory protection in accordance with Table I.

(6) Exposure monitoring.

(a) General. Determinations of airborne exposure levels shall be made from air samples that are representative of each employee's exposure to DBCP over an eight-hour period. (For the purposes of this section, employee exposure is that exposure which would occur if the employee were not using a respirator.)

(b) Initial. Each employer who has a place of employment in which DBCP is present shall monitor each workplace and work operation to accurately determine the airborne concentrations of DBCP to which employees may be exposed.

(c) Frequency.

(i) If the monitoring required by this section reveals employee exposures to be below the permissible exposure limits, the employer shall repeat these determinations at least quarterly.

(ii) If the monitoring required by this section reveals employee exposure to be in excess of the permissible exposure limits, the employer shall repeat these determinations for each such employee at least monthly. The employer shall continue these monthly determinations until at least two consecutive measurements, taken at least seven days apart, are below the permissible exposure limit, thereafter the employer shall monitor at least quarterly.

(d) Additional. Whenever there has been a production process, control or personnel change which may result in

any new or additional exposure to DBCP, or whenever the employer has any other reason to suspect a change which may result in new or additional exposure to DBCP, additional monitoring which complies with subsection (6) shall be conducted.

(e) Employee notification.

(i) Within five working days after the receipt of monitoring results, the employer shall notify each employee in writing of results which represent the employee's exposure.

(ii) Whenever the results indicate that employee exposure exceeds the permissible exposure limit, the employer shall include in the written notice a statement that the permissible exposure limit was exceeded and a description of the corrective action being taken to reduce exposure to or below the permissible exposure limits.

(f) Accuracy of measurement. The method of measurement shall be accurate, to a confidence level of 95 percent, to within plus or minus 25 percent for concentrations of DBCP at or above the permissible exposure limits.

(7) Methods of compliance.

(a) Priority of compliance methods. The employer shall institute engineering and work practice controls to reduce and maintain employee exposures to DBCP at or below the permissible exposure limit, except to the extent that the employer establishes that such controls are not feasible. Where feasible engineering and work practice controls are not sufficient to reduce employee exposures to within the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls, and shall supplement them by use of respiratory protection.

(b) Compliance program.

(i) The employer shall establish and implement a written program to reduce employee exposure to DBCP to or below the permissible exposure limit solely by means of engineering and work practice controls as required by this section.

(ii) The written program shall include a detailed schedule for development and implementation of the engineering and work practice controls. These plans shall be revised at least every six months to reflect the current status of the program.

(iii) Written plans for these compliance programs shall be submitted upon request to the director, and shall be available at the worksite for examination and copying by the director, and any affected employee or designated representative of employees.

(iv) The employer shall institute and maintain at least the controls described in his most recent written compliance program.

(8) Respirators.

(a) General. Where respiratory protection is required under this section, the employer shall select, provide and assure the proper use of respirators.

(b) Respirators shall be used in the following circumstances:

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

(ii) During maintenance and repair activities in which engineering and work practice controls are not feasible; or

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

(iv) In emergencies.

(9) Respirator selection.

(a) Where respirators are required under this section, the employer shall select and provide, at no cost to the employee, the appropriate respirator from Table I of this section and shall assure that the employee uses the respirator provided.

(b) The employer shall select respirators from among those approved by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11.

TABLE I
RESPIRATORY PROTECTION FOR DBCP

Concentration Not Greater Than	Respirator Type
(a) 10 ppb:	(i) Any supplied-air respirator.
	(ii) Any self-contained breathing apparatus.
(b) 50 ppb:	(i) Any supplied-air respirator with full facepiece, helmet or hood.
	(ii) Any self-contained breathing apparatus with full facepiece.
(c) 250 ppb:	(i) A Type C supplied-air respirator operated in pressure-demand or other positive pressure or continuous flow mode.
(d) 500 ppb:	(i) A Type C supplied-air respirator with full facepiece operated in pressure-demand mode with full facepiece.
(e) Greater than 500 ppb or entry into unknown concentrations:	(i) A combination respirator which includes a Type C supplied-air respirator with full facepiece operated in pressure-demand mode and an auxiliary self-contained breathing apparatus.
	(ii) A self-contained breathing apparatus with full facepiece operated in pressure-demand mode.
(f) Firefighting:	(i) A self-contained breathing apparatus with full facepiece operated in pressure-demand mode.

(c) Respirator program.

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

(ii) Employees who wear respirators shall be allowed to wash their face and respirator facepiece to prevent potential skin irritation associated with respirator use.

(10) Emergency situations.

(a) Written plans.

(i) A written plan for emergency situations shall be developed for each workplace in which DBCP is present.

(ii) Appropriate portions of the plan shall be implemented in the event of an emergency.

(b) Employees engaged in correcting conditions shall be equipped as required in subsection (11) of this section until the emergency is abated.

(c) Evacuation. Employees not engaged in correcting the emergency shall be removed and restricted from the area and normal operations in the affected area shall not be resumed until the emergency is abated.

(d) Alerting employees. Where there is a possibility of employee exposure to DBCP due to the occurrence of an emergency, a general alarm shall be installed and maintained to promptly alert employees of such occurrences.

(e) Medical surveillance. For any employee exposed to DBCP in an emergency situation, the employer shall provide medical surveillance in accordance with subsection (14) of this section.

(f) Exposure monitoring.

(i) Following an emergency, the employer shall conduct monitoring which complies with subsection (6) of this section.

(ii) In workplaces not normally subject to periodic monitoring, the employer may terminate monitoring when two consecutive measurements indicate exposures below the permissible exposure limit.

(11) Protective clothing and equipment.

(a) Provision and use. Where eye or skin contact with liquid or solid DBCP may occur, employers shall provide at no cost to the employee, and assure that employees wear impermeable protective clothing and equipment in accordance with WAC 296-24-07501 and 296-24-07801 to protect the area of the body which may come in contact with DBCP.

(b) Cleaning and replacement.

(i) The employer shall clean, launder, maintain, or replace protective clothing and equipment required by this subsection to maintain their effectiveness. In addition, the employer shall provide clean protective clothing and equipment at least daily to each affected employee.

(ii) Removal and storage.

(A) The employer shall assure that employees remove DBCP contaminated work clothing only in change rooms provided in accordance with subsection (13) of this section.

(B) The employer shall assure that employees promptly remove any protective clothing and equipment which becomes contaminated with DBCP-containing liquids and solids. This clothing shall not be reworn until the DBCP has been removed from the clothing or equipment.

(C) The employer shall assure that no employee takes DBCP contaminated protective devices and work clothing out of the change room, except those employees authorized to do so for the purpose of laundering, maintenance, or disposal.

(iii) The employer shall assure that DBCP-contaminated protective work clothing and equipment is placed and stored in closed containers which prevent dispersion of DBCP outside the container.

(iv) The employer shall inform any person who launders or cleans DBCP-contaminated protective clothing or equipment of the potentially harmful effects of exposure to DBCP.

(v) The employer shall assure that the containers of contaminated protective clothing and equipment which are to be removed from the workplace for any reason are labeled in accordance with subsection (16)(c) of this section.

(vi) The employer shall prohibit the removal of DBCP from protective clothing and equipment by blowing or shaking.

(12) Housekeeping.

(a) Surfaces.

(i) All surfaces shall be maintained free of accumulations of DBCP.

(ii) Dry sweeping and the use of air for the cleaning of floors and other surfaces where DBCP dust or liquids are found is prohibited.

(iii) Where vacuuming methods are selected, either portable units or a permanent system may be used.

(A) If a portable unit is selected, the exhaust shall be attached to the general workplace exhaust ventilation system or collected within the vacuum unit, equipped with high efficiency filters or other appropriate means of contaminant removal, so that DBCP is not reintroduced into the workplace air; and

(B) Portable vacuum units used to collect DBCP may not be used for other cleaning purposes and shall be labeled as prescribed by subsection (16)(c) of this section.

(iv) Cleaning of floors and other contaminated surfaces may not be performed by washing down with a hose, unless a fine spray has first been laid down.

(b) Liquids. Where DBCP is present in a liquid form, or as a resultant vapor, all containers or vessels containing DBCP shall be enclosed to the maximum extent feasible and tightly covered when not in use.

(c) Waste disposal. DBCP waste, scrap, debris, bags, containers or equipment, shall be disposed in sealed bags or other closed containers which prevent dispersion of DBCP outside the container.

(13) Hygiene facilities and practices. Hygiene facilities shall be provided and practices implemented in accordance with the requirements of WAC 296-24-12009.

(14) Medical surveillance.

(a) General. The employer shall institute a program of medical surveillance for each employee who is or will be exposed, without regard to the use of respirators, to DBCP. The employer shall provide each such employee with an opportunity for medical examinations and tests in accordance with this subsection. All medical examinations and procedures shall be performed by or under the supervision of a licensed physician, and shall be provided without cost to the employee.

(b) Frequency and content. Within 30 days of the effective date of this section or time of initial assignment, and whenever exposure to DBCP, the employer shall provide a medical examination including at least the following:

(i) A complete medical and occupational history with emphasis on reproductive history.

(ii) A complete physical examination with emphasis on the genito-urinary tract, testicle size, and body habitus including the following tests:

(A) Sperm count;

(B) Complete urinalysis (U/A);

(C) Complete blood count; and

(D) Thyroid profile.

(iii) A serum specimen shall be obtained and the following determinations made by radioimmunoassay techniques utilizing National Institutes of Health (NIH) specific antigen or one of equivalent sensitivity:

(A) Serum multiphasic analysis (SMA 12);

(B) Serum follicle stimulating hormone (FSH);

(C) Serum luteinizing hormone (LH); and

(D) Serum estrogen (females).

(iv) Any other tests deemed appropriate by the examining physician.

(c) Additional examinations. If the employee for any reason develops signs or symptoms commonly associated with exposure to DBCP, the employer shall provide the employee with a medical examination which shall include those elements considered appropriate by the examining physician.

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

(i) A copy of this standard and its appendices;

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

(iii) The level of DBCP to which the employee is exposed; and

(iv) A description of any personal protective equipment used or to be used.

(e) Physician's written opinion.

(i) For each examination under this section, the employer shall obtain and provide the employee with a written opinion from the examining physician which shall include:

(A) The results of the medical tests performed;

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

(C) Any recommended limitations upon the employee's exposure to DBCP or upon the use of protective clothing and equipment such as respirators; and

(D) A statement that the employee was informed by the physician of the results of the medical examination, and any medical conditions which require further examination or treatment.

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

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

(f) Emergency situations. If the employee is exposed to DBCP in an emergency situation, the employer shall provide the employee with a sperm count test as soon as practicable, or, if the employee is unable to produce a semen specimen, the hormone tests contained in subsection (14)(b) of this section. The employer shall provide these same tests three months later.

(15) Employee information and training.

(a) Training program.

(i) Within thirty days of the effective date of this standard, the employer shall institute a training program for all employees who may be exposed to DBCP and shall assure their participation in such training program.

(ii) The employer shall assure that each employee is informed of the following:

(A) The information contained in Appendices A, B and C;

(B) The quantity, location, manner of use, release or storage of DBCP and the specific nature of operations which could result in exposure to DBCP as well as any necessary protective steps;

(C) The purpose, proper use, and limitations of respirators;

(D) The purpose and description of the medical surveillance program required by subsection (14) of this section; and

(E) A review of this standard.

(b) Access to training materials.

(i) The employer shall make a copy of this standard and its appendices readily available to all affected employees.

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

(16) Signs and labels.

(a) General.

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

(ii) The employer shall assure that no statement appears on or near any sign or label required by this subsection which contradicts or detracts from the required sign or label.

(b) Signs.

(i) The employer shall post signs to clearly indicate all work areas where DBCP may be present. These signs shall bear the legend:

DANGER
1,2-Dibromo-3-chloropropane

(Insert appropriate trade or common names)
CANCER HAZARD
AUTHORIZED PERSONNEL ONLY

(ii) Where airborne concentrations of DBCP exceed the permissible exposure limits, the signs shall bear the additional legend:

RESPIRATOR REQUIRED

(c) Labels.

(i) The employer shall assure that precautionary labels are affixed to all containers of DBCP and of products containing DBCP, and that the labels remain affixed when the DBCP or products containing DBCP are sold, distributed, or otherwise leave the employer's workplace. Where DBCP or products containing DBCP are sold, distributed or otherwise leave the employer's workplace bearing appropriate labels required by EPA

under the regulations in 40 CFR Part 162, the labels required by this subsection need not be affixed.

(ii) The employer shall assure that the precautionary labels required by this subsection are readily visible and legible. The labels shall bear the following legend:

DANGER
1,2-Dibromo-3-chloropropane
CANCER HAZARD

(17) Recordkeeping.

(a) Exposure monitoring.

(i) The employer shall establish and maintain an accurate record of all monitoring required by subsection (6) of this section.

(ii) This record shall include:

(A) The dates, number, duration and results of each of the samples taken, including a description of the sampling procedure used to determine representative employee exposure;

(B) A description of the sampling and analytical methods used;

(C) Type of respiratory worn, if any; and

(D) Name, Social Security number, and job classification of the employee monitored and of all other employees whose exposure the measurement is intended to represent.

(iii) The employer shall maintain this record for at least forty years or the duration of employment plus twenty years, whichever is longer.

(b) Medical surveillance.

(i) The employer shall establish and maintain an accurate record for each employee subject to medical surveillance required by subsection (14) of this section.

(ii) This record shall include:

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

(B) A copy of the physician's written opinion;

(C) Any employee medical complaints related to exposure to DBCP;

(D) A copy of the information provided the physician as required by subsection (14)(c) of this section; and

(E) A copy of the employee's medical and work history.

(iii) The employer shall maintain this record for at least forty years or the duration of employment plus twenty years, whichever is longer.

(c) Availability.

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

(ii) Employee exposure monitoring records and employee medical records required by this subsection shall be provided upon request to employees' designated representatives and the assistant director in accordance with WAC 296-62-05201 through 296-62-05209; and 296-62-05213 through 296-62-05217.

(d) Transfer of records.

(i) If the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained by this section for the prescribed period.

(ii) If the employer ceases to do business and there is no successor employer to receive and retain the records for the prescribed period, the employer shall transmit these records by mail to the director.

(iii) At the expiration of the retention period for the records required to be maintained under this section, the employer shall transmit these records by mail to the director.

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

(18) Observation of monitoring.

(a) Employee observation. The employer shall provide affected employees, or their designated representatives, an opportunity to observe any monitoring of employee exposure to DBCP conducted under subsection (6) of this section.

(b) Observation procedures.

(i) Whenever observation of the measuring or monitoring of employee exposure to DBCP requires entry into an area where the use of protective clothing or equipment is required, the employer shall provide the observer with personal protective clothing or equipment required to be worn by employees working in the area, assure the use of such clothing and equipment, and require the observer to comply with all other applicable safety and health procedures.

(ii) Without interfering with the monitoring or measurement, observers shall be entitled to:

(A) Receive an explanation of the measurement procedures;

(B) Observe all steps related to the measurement of airborne concentrations of DBCP performed at the place of exposure; and

(C) Record the results obtained.

(19) Effective date. This standard will become effective July 28, 1978.

(20) Appendices. The information contained in the appendices is not intended, by itself, to create any additional obligations not otherwise imposed or to detract from any existing obligation.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-62-07342, filed 5/11/88.]

WAC 296-62-07343 Appendix A—Substance safety data sheet for DBCP. (1) Substance identification.

(a) Synonyms and trades names: DBCP; Dibromochloropropane; Fumazone (Dow Chemical Company TM); Nemaflume; Nemagon (Shell Chemical Co. TM); Nemaset; BBC 12; and OS 1879.

(b) Permissible exposure:

(i) Airborne. 1 part DBCP vapor per billion parts of air (1 ppb); time-weighted average (TWA) for an eight-hour workday.

(ii) Dermal. Eye contact and skin contact with DBCP are prohibited.

(c) Appearance and odor: Technical grade DBCP is a dense yellow or amber liquid with a pungent odor. It may also appear in granular form, or blended in varying concentrations with other liquids.

(d) Uses: DBCP is used to control nematodes, very small worm-like plant parasites, on crops including cotton, soybeans, fruits, nuts, vegetables and ornamentals.

(2) Health hazard data.

(a) Routes of entry: Employees may be exposed:

(i) Through inhalation (breathing);

(ii) Through ingestion (swallowing);

(iii) Skin contact; and

(iv) Eye contact.

(b) Effects of exposure:

(i) Acute exposure. DBCP may cause drowsiness, irritation of the eyes, nose, throat and skin, nausea and vomiting. In addition, overexposure may cause damage to the lungs, liver or kidneys.

(ii) Chronic exposure. Prolonged or repeated exposure to DBCP has been shown to cause sterility in humans. It also has been shown to produce cancer and sterility in laboratory animals and has been determined to constitute an increased risk of cancer in man.

(iii) Reporting signs and symptoms. If you develop any of the above signs or symptoms that you think are caused by exposure to DBCP, you should inform your employer.

(3) Emergency first aid procedures.

(a) Eye exposure. If DBCP liquid or dust containing DBCP gets into your eyes, wash your eyes immediately with large amounts of water, lifting the lower and upper lids occasionally. Get medical attention immediately. Contact lenses should not be worn when working with DBCP.

(b) Skin exposure. If DBCP liquids or dusts containing DBCP get on your skin, immediately wash using soap or mild detergent and water. If DBCP liquids or dusts containing DBCP penetrate through your clothing, remove the clothing immediately and wash. If irritation is present after washing get medical attention.

(c) Breathing. If you or any person breathe in large amounts of DBCP, move the exposed person to fresh air at once. If breathing has stopped, perform artificial respiration. Do not use mouth-to-mouth. Keep the affected person warm and at rest. Get medical attention as soon as possible.

(d) Swallowing. When DBCP has been swallowed and the person is conscious, give the person large amounts of water immediately. After the water has been swallowed, try to get the person to vomit by having him touch the back of his throat with his finger. Do not make an unconscious person vomit. Get medical attention immediately.

(e) Rescue. Notify someone. Put into effect the established emergency rescue procedures. Know the locations of the emergency rescue equipment before the need arises.

(4) Respirators and protective clothing.

(a) Respirators. You may be required to wear a respirator in emergencies and while your employer is in the process of reducing DBCP exposures through engineering controls. If respirators are worn, they must have a National Institute for Occupational Safety and Health (NIOSH) approval label (older respirators may have a

Bureau of Mines Approval label). For effective protection, a respirator must fit your face and head snugly. The respirator should not be loosened or removed in work situations where its use is required. DBCP does not have a detectable odor except at 1,000 times or more above the permissible exposure limit. If you can smell DBCP while wearing a respirator, the respirator is not working correctly; go immediately to fresh air. If you experience difficulty breathing while wearing a respirator, tell your employer.

(b) Protective clothing. When working with DBCP you must wear for your protection impermeable work clothing provided by your employer. (Standard rubber and neoprene protective clothing do not offer adequate protection). DBCP must never be allowed to remain on the skin. Clothing and shoes must not be allowed to become contaminated with DBCP, and if they do, they must be promptly removed and not worn again until completely free of DBCP. Turn in impermeable clothing that has developed leaks for repair or replacement.

(c) Eye protection. You must wear splashproof safety goggles where there is any possibility of DBCP liquid or dust contacting your eyes.

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

(a) DBCP must be stored in tightly closed containers in a cool, well-ventilated area.

(b) If your work clothing may have become contaminated with DBCP, or liquids or dusts containing DBCP, you must change into uncontaminated clothing before leaving the work premises.

(c) You must promptly remove any protective clothing that becomes contaminated with DBCP. This clothing must not be reworn until the DBCP is removed from the clothing.

(d) If your skin becomes contaminated with DBCP, you must immediately and thoroughly wash or shower with soap or mild detergent and water to remove any DBCP from your skin.

(e) You must not keep food, beverages, cosmetics, or smoking materials, nor eat or smoke, in regulated areas.

(f) If you work in a regulated area, you must wash your hands thoroughly with soap or mild detergent and water, before eating, smoking or using toilet facilities.

(g) If you work in a regulated area, you must remove any protective equipment or clothing before leaving the regulated area.

(h) Ask your supervisor where DBCP is used in your work area and for any additional safety and health rules.

(6) Access to information.

(a) Each year, your employer is required to inform you of the information contained in this substance safety data sheet for DBCP. In addition, your employer must instruct you in the safe use of DBCP, emergency procedures, and the correct use of protective equipment.

(b) Your employer is required to determine whether you are being exposed to DBCP. You or your representative have the right to observe employee exposure measurements and to record the result obtained. Your employer is required to inform you of your exposure. If

your employer determines that you are being overexposed, he is required to inform you of the actions which are being taken to reduce your exposure.

(c) Your employer is required to keep records of your exposure and medical examinations. Your employer is required to keep exposure and medical data for at least forty years or the duration of your employment plus twenty years, whichever is longer.

(d) Your employer is required to release exposure and medical records to you, your physician, or other individual designated by you upon your written request.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-62-07343, filed 5/11/88.]

WAC 296-62-07344 Appendix B--Substance technical guidelines for DBCP. (1) Physical and chemical data.

(a) Substance identification.

(i) Synonyms: 1,2-dibromo-3-chloropropane; DBCP, Fumazone; Nema fume; Nema gon; Nema set; BBC 12; OS 1879. DBCP is also included in agricultural pesticides and fumigants which include the phrase "Nema ____" in their name.

(ii) Formula: C₃H₅Br₂Cl.

(iii) Molecular weight: 236.

(b) Physical data:

(i) Boiling point (760 mm HG): 195C (383F)

(ii) Specific gravity (water = 1): 2.093.

(iii) Vapor density (air = 1 at boiling point of DBCP): Data not available.

(iv) Melting point: 6C (43F).

(v) Vapor pressure at 20C (68F): 0.8 mm HG

(vi) Solubility in water: 1000 ppm.

(vii) Evaporation rate (Butyl Acetate = 1): very much less than 1.

(c) Appearance and odor: Dense yellow or amber liquid with a pungent odor at high concentrations. Any detectable odor of DBCP indicates overexposure.

(2) Fire explosion and reactivity hazard data.

(a) Fire.

(i) Flash point: 170F (77C)

(ii) Autoignition temperature: Data not available.

(iii) Flammable limits in air, percent by volume: Data not available.

(iv) Extinguishing media: Carbon dioxide, dry chemical.

(v) Special fire-fighting procedures: Do not use a solid stream of water since a stream will scatter and spread the fire. Use water spray to cool containers exposed to a fire.

(vi) Unusual fire and explosion hazards: None known.

(vii) For purposes of complying with the requirements of WAC 296-24-330, liquid DBCP is classified as a Class III A combustible liquid.

(viii) For the purpose of complying with WAC 296-24-95613, the classification of hazardous locations as described in article 500 of the National Electrical Code for DBCP shall be Class I, Group D.

(ix) For the purpose of compliance with WAC 296-24-592, DBCP is classified as a Class B fire hazard.

(x) For the purpose of compliance with WAC 296-24-230, locations classified as hazardous locations due to the presence of DBCP shall be Class I, Group D.

(xi) Sources of ignition are prohibited where DBCP presents a fire or explosion hazard.

(b) Reactivity.

(i) Conditions contributing to instability: None known.

(ii) Incompatibilities: Reacts with chemically active metals, such as aluminum, magnesium and tin alloys.

(iii) Hazardous decomposition products: Toxic gases and vapors (such as HBr, HCl and carbon monoxide) may be released in a fire involving DBCP.

(iv) Special precautions: DBCP will attack some rubber materials and coatings.

(3) Spill, leak and disposal procedures.

(a) If DBCP is spilled or leaked, the following steps should be taken:

(i) The area should be evacuated at once and re-entered only after thorough ventilation.

(ii) Ventilate area of spill or leak.

(iii) If in liquid form, collect for reclamation or absorb in paper, vermiculite, dry sand, earth or similar material.

(iv) If in solid form, collect spilled material in the most convenient and safe manner for reclamation or for disposal.

(b) Persons not wearing protective equipment must be restricted from areas of spills or leaks until cleanup has been completed.

(c) Waste disposal methods:

(i) For small quantities of liquid DBCP, absorb on paper towels, remove to a safe place (such as a fume hood) and burn the paper. Large quantities can be reclaimed or collected and atomized in a suitable combustion chamber equipped with an appropriate effluent gas cleaning device. If liquid DBCP is absorbed in vermiculite, dry sand, earth or similar material and placed in sealed containers it may be disposed of in a state-approved sanitary landfill.

(ii) If in solid form, for small quantities, place on paper towels, remove to a safe place (such as a fume hood) and burn. Large quantities may be reclaimed. However, if this is not practical, dissolve in a flammable solvent (such as alcohol) and atomize in a suitable combustion chamber equipped with an appropriate effluent gas cleaning device. DBCP in solid form may also be disposed in a state-approved sanitary landfill.

(4) Monitoring and measurement procedures.

(a) Exposure above the permissible exposure limit.

(i) Eight hour exposure evaluation: Measurements taken for the purpose of determining employee exposure under this section are best taken so that the average eight-hour exposure may be determined from a single eight-hour sample or two four-hour samples. Air samples should be taken in the employee's breathing zone (air that would most nearly represent that inhaled by the employee).

(ii) Monitoring techniques: The sampling and analysis under this section may be performed by collecting the DBCP vapor on petroleum based charcoal absorption

tubes with subsequent chemical analyses. The method of measurement chosen should determine the concentration of airborne DBCP at the permissible exposure limit to an accuracy of plus or minus twenty-five percent. If charcoal tubes are used, a total volume of ten liters should be collected at a flow rate of 50 cc per minute for each tube. Analyze the resultant samples as you would samples of halogenated solvent.

(b) Since many of the duties relating to employee protection are dependent on the results of monitoring and measuring procedures, employers should assure that the evaluation of employee exposures is performed by a competent industrial hygienist or other technically qualified person.

(5) Protective clothing. Employees should be required to wear appropriate protective clothing to prevent any possibility of skin contact with DBCP. Because DBCP is absorbed through the skin, it is important to prevent skin contact with both liquid and solid forms of DBCP. Protective clothing should include impermeable coveralls or similar fullbody work clothing, gloves, headcoverings, and workshoes or shoe coverings. Standard rubber and neoprene gloves do not offer adequate protection and should not be relied upon to keep DBCP off the skin. DBCP should never be allowed to remain on the skin. Clothing and shoes should not be allowed to become contaminated with the material; and if they do, they should be promptly removed and not worn again until completely free of the material. Any protective clothing which has developed leaks or is otherwise found to be defective should be repaired or replaced. Employees should also be required to wear splashproof safety goggles where there is any possibility of DBCP contacting the eyes.

(6) Housekeeping and hygiene facilities.

(a) The workplace must be kept clean, orderly and in a sanitary condition.

(b) Dry sweeping and the use of compressed air is unsafe for the cleaning of floors and other surfaces where DBCP dust or liquids are found. To minimize the contamination of air with dust, vacuuming with either portable or permanent systems must be used. If a portable unit is selected, the exhaust must be attached to the general workplace exhaust ventilation system, or collected within the vacuum unit equipped with high efficiency filters or other appropriate means of contamination removal and not used for other purposes. Units used to collect DBCP must be labeled.

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

(d) Change or dressing rooms with individual clothes storage facilities must be provided to prevent the contamination of street clothes with DBCP. Because of the hazardous nature of DBCP, contaminated protective clothing must be stored in closed containers for cleaning or disposal.

(7) Miscellaneous precautions.

(a) Store DBCP in tightly closed containers in a cool, well ventilated area.

(b) Use of supplied-air suits or other impervious clothing (such as acid suits) may be necessary to prevent skin contact with DBCP. Supplied-air suits should be selected, used, and maintained under the supervision of persons knowledgeable in the limitations and potential life-endangering characteristics of supplied-air suits.

(c) The use of air-conditioned suits may be necessary in warmer climates.

(d) Advise employees of all areas and operations where exposure to DBCP could occur.

(8) Common operations. Common operations in which exposure to DBCP is likely to occur are: during its production; and during its formulation into pesticides and fumigants.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-62-07344, filed 5/11/88.]

WAC 296-62-07345 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-62-07346 Appendix C--Medical surveillance guidelines for DBCP. (1) Route of entry.

(a) Inhalation;

(b) Skin absorption.

(2) Toxicology. Recent data collected on workers involved in the manufacture and formulation of DBCP has shown that DBCP can cause sterility at very low levels of exposure. This finding is supported by studies showing that DBCP causes sterility in animals. Chronic exposure to DBCP resulted in pronounced necrotic action on the parenchymatous organs (i.e., liver, kidney, spleen) and on the testicles of rats at concentrations as low as 5 ppm. Rats that were chronically exposed to DBCP also showed changes in the composition of the blood, showing low RBC, hemoglobin, and WBC, and high reticulocyte levels as well as functional hepatic disturbance, manifesting itself in a long prothrombin time. Reznik et al., noted a single dose of 100 mg produced profound depression of the nervous system of rats. Their condition gradually improved. Acute exposure also resulted in the destruction of the sex gland activity of male rats as well as causing changes in the estrous cycle in female rats. Animal studies have also associated DBCP with an increased incidence of carcinoma. Olson, et al., orally administered DBCP to rats and mice five times per week at experimentally predetermined maximally tolerated doses and at half those doses. As early as ten weeks after initiation of treatment, DBCP induced a high incidence of squamous cell carcinomas of the stomach with metastases in both species. DBCP also induced mammary adenocarcinomas in the female rats at both dose levels.

(3) Signs and symptoms.

(a) Inhalation: Nausea, eye irritation, conjunctivitis, respiratory irritation, pulmonary congestion or edema, CNS depression with apathy, sluggishness, and ataxia.

(b) Dermal: Erythema or inflammation and dermatitis on repeated exposure.

(4) Special tests.

(a) Semen analysis: The following information excerpted from the document "Evaluation of Testicular

Function," submitted by the Corporate Medical Department of the Shell Oil Company (exhibit 39-3), may be useful to physicians conducting the medical surveillance program. In performing semen analyses certain minimal but specific criteria should be met:

(i) It is recommended that a minimum of three valid semen analyses be obtained in order to make a determination of an individual's average sperm count.

(ii) A period of sexual abstinence is necessary prior to the collection of each masturbatory sample. It is recommended that intercourse or masturbation be performed 48 hours before the actual specimen collection. A period of 48 hours of abstinence would follow; then the masturbatory sample would be collected.

(iii) Each semen specimen should be collected in a clean, widemouthed, glass jar (not necessarily pre-sterilized) in a manner designated by the examining physician. Any part of the seminal fluid exam should be initialed *only after liquifaction* is complete, i.e., 30 to 45 minutes after collection.

(iv) Semen volume should be measured to the nearest 1/10 of a cubic centimeter.

(v) Sperm density should be determined using routine techniques involving the use of a white cell pipette and a hemocytometer chamber. The immobilizing fluid most effective and most easily obtained for this process is distilled water.

(vi) Thin, dry smears of the semen should be made for a morphologic classification of the sperm forms and should be stained with either hematoxylin or the more difficult, yet more precise, Papanicolaou technique. Also of importance to record is obvious sperm agglutination, pyospermia, delayed liquifaction (greater than 30 minutes), and hyperviscosity. In addition, pH, using nitrazine paper, should be determined.

(vii) A total morphology evaluation should include percentages of the following:

(A) Normal (oval) forms,

(B) Tapered forms,

(C) Amorphous forms (include large and small sperm shapes),

(D) Duplicated (either heads or tails) forms, and

(E) Immature forms.

(viii) Each sample should be evaluated for sperm *viability* (percent viable sperm moving at the time of examination) as well as sperm *motility* (subjective characterization of "purposeful forward sperm progression" of the majority of those viable sperm analyzed) within two hours after collection, ideally by the same or equally qualified examiner.

(b) Serum determinations: The following serum determinations should be performed by radiimmuno-assay techniques using National Institutes of Health (NIH) specific antigen or antigen preparations of equivalent sensitivity:

(i) Serum follicle stimulating hormone (FSH),

(ii) Serum luteinizing hormone (LH), and

(iii) Serum total estrogen (females only).

(5) Treatment. Remove from exposure immediately, give oxygen or artificial resuscitation if indicated. Contaminated clothing and shoes should be removed immediately. Flush eyes and wash contaminated skin. If swallowed and the person is conscious, induce vomiting. Recovery from mild exposures is usually rapid and complete.

(6) Surveillance and preventive considerations.

(a) Other considerations. DBCP can cause both acute and chronic effects. It is important that the physician become familiar with the operating conditions in which exposure to DBCP occurs. Those with respiratory disorders may not tolerate the wearing of negative pressure respirators.

(b) Surveillance and screening. Medical histories and laboratory examinations are required for each employee subject to exposure to DBCP. The employer should screen employees for history of certain medical conditions (listed below) which might place the employee at increased risk from exposure:

(i) Liver disease. The primary site of biotransformation and detoxification of DBCP is the liver. Liver dysfunctions likely to inhibit the conjugation reactions will tend to promote the toxic actions of DBCP. These precautions should be considered before exposing persons with impaired liver function to DBCP.

(ii) Renal disease. Because DBCP has been associated with injury to the kidney it is important that special consideration be given to those with possible impairment of renal function.

(iii) Skin disease. DBCP can penetrate the skin and can cause erythema on prolonged exposure. Persons with pre-existing skin disorders may be more susceptible to the effects of DBCP.

(iv) Blood dyscrasias. DBCP has been shown to decrease the content of erythrocytes, hemoglobin, and leukocytes in the blood, as well as increase the prothrombin time. Persons with existing blood disorders may be more susceptible to the effects of DBCP.

(v) Reproductive disorders. Animal studies have associated DBCP with various effects on the reproductive organs. Among these effects are atrophy of the testicles and changes in the estrous cycle. Persons with pre-existing reproductive disorders may be at increased risk to these effects of DBCP.

(7) References.

(a) Reznik, Ya. B. and Sprinchan, G. K.: Experimental Data on the Gonadotoxic effect of Nemagon, *Gig. Sanit.*, (6), 1975, pp. 101-102, (translated from Russian).

(b) Faydysh, E. V., Rakhmatullaev, N. N. and Varshavskii, V. A.: The Cytotoxic Action of Nemagon in a Subacute Experiment, *Med. Zh. Uzbekistana*, (No. 1), 1970, pp. 64-65, (translated from Russian).

(c) Rakhmatullaev, N. N.: Hygienic Characteristics of the Nematocide Nemagon in Relation to Water Pollution Control, *Hyg. Sanit.*, 36(3), 1971, pp. 344-348, (translated from Russian).

(d) Olson, W. A. *et al.*: Induction of Stomach Cancer in Rats and Mice by Halogenated Aliphatic Fumigants,

Journal of the National Cancer Institute, (51), 1973, pp. 1993-1995.

(e) Torkelson, T. R. *et al.*: Toxicologic Investigations of 1,2-Dibromo-3-chloropropane, *Toxicology and Applied Pharmacology*, 3, 1961 pp. 545-559.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-62-07346, filed 5/11/88.]

WAC 296-62-07353 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-62-07355 Scope and application. (1) WAC 296-62-07355 through 296-62-07389 applies to all occupational exposures to ethylene oxide (EtO), Chemical Abstracts Service Registry No. 75-21-8, except as provided in subsection (2) of this section.

(2) WAC 296-62-07355 through 296-62-07389 does not apply to the processing, use, or handling of products containing EtO where objective data are reasonably relied upon that demonstrate that the product is not capable of releasing EtO in airborne concentrations at or above the action level, and may not reasonably be foreseen to release EtO in excess of the excursion limit, under the expected conditions of processing, use, or handling that will cause the greatest possible release.

(3) Where products containing EtO are exempted under subsection (2) of this section, the employer shall maintain records of the objective data supporting that exemption and the basis for the employer's reliance on the data, as provided in WAC 296-62-07375(1).

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-62-07355, filed 11/14/88; 87-24-051 (Order 87-24), § 296-62-07355, filed 11/30/87.]

WAC 296-62-07357 Definitions. For the purpose of WAC 296-62-07355 through 296-62-07389, the following definitions shall apply:

(1) "Action level" means a concentration of airborne EtO of 0.5 ppm calculated as an eight-hour time-weighted average.

(2) "Authorized person" means any person specifically authorized by the employer whose duties require the person to enter a regulated area, or any person entering such an area as a designated representative of employees for the purpose of exercising the right to observe monitoring and measuring procedures under WAC 296-62-07377, or any other person authorized by chapter 49.17 RCW or regulations issued under chapter 49.17 RCW.

(3) "Director" means the director of the department of labor and industries, or designee.

(4) "Emergency" means any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that is likely to or does result in an unexpected significant release of EtO.

(5) "Employee exposure" means exposure to airborne EtO which would occur if the employee were not using respiratory protective equipment.

(6) "Ethylene oxide" or "EtO" means the three-membered ring organic compound with chemical formula C₂H₄O.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07357, filed 11/30/87.]

WAC 296-62-07359 Permissible exposure limits (PEL). (1) Eight-hour time-weighted average (TWA). The employer shall ensure that no employee is exposed to an airborne concentration of EtO in excess of one part EtO per million parts of air (1 ppm) as an eight-hour time-weighted average. (Eight-hour TWA.)

(2) Excursion limit. The employer shall ensure that no employee is exposed to an airborne concentration of EtO in excess of five parts of EtO per million parts of air (5 ppm) as averaged over a sampling period of fifteen minutes.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-62-07359, filed 11/14/88; 87-24-051 (Order 87-24), § 296-62-07359, filed 11/30/87.]

WAC 296-62-07361 Exposure monitoring. (1) General.

(a) Determinations of employee exposure shall be made from breathing zone air samples that are representative of the eight-hour TWA and fifteen-minute short-term exposures of each employee.

(b) Representative eight-hour TWA employee exposure shall be determined on the basis of one or more samples representing full-shift exposure for each shift for each job classification in each work area. Representative fifteen-minute short-term employee exposures shall be determined on the basis of one or more samples representing fifteen-minute exposures associated with operations that are most likely to produce exposures above the excursion limit for each shift for each job classification in each work area.

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

(2) Initial monitoring.

(a) Each employer who has a workplace or work operation covered by WAC 296-62-07355 through 296-62-07389, except as provided in WAC 296-62-07355(2) or (b) of this subsection, shall perform initial monitoring to determine accurately the airborne concentrations of EtO to which employees may be exposed.

(b) Where the employer has monitored after June 15, 1983, and the monitoring satisfies all other requirements of WAC 296-62-07355 through 296-62-07389, the employer may rely on such earlier monitoring results to satisfy the requirements of (a) of this subsection.

(c) Where the employer has previously monitored for the excursion limit and the monitoring satisfies all other requirements of this section, the employer may rely on such earlier monitoring results to satisfy the requirements of (a) of this subsection.

(3) Monitoring frequency (periodic monitoring).

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

(b) If the monitoring required by subsection (2)(a) of this section reveals employee exposure above the eight-hour TWA, the employer shall repeat such monitoring for each such employee at least every three months.

(c) The employer may alter the monitoring schedule from quarterly to semiannually for any employee for whom two consecutive measurements taken at least seven days apart indicate that the employee's exposure has decreased to or below the eight-hour TWA.

(d) If the monitoring required by subsection (2)(a) of this section reveals employee exposure above the fifteen-minute excursion limit, the employer shall repeat such monitoring for each such employee at least every three months, and more often as necessary to evaluate the employee's short-term exposures.

(4) Termination of monitoring.

(a) If the initial monitoring required by subsection (2)(a) of this section reveals employee exposure to be below the action level, the employer may discontinue TWA monitoring for those employees whose exposures are represented by the initial monitoring.

(b) If the periodic monitoring required by subsection (3) of this section reveals that employee exposures, as indicated by at least two consecutive measurements taken at least seven days apart, are below the action level, the employer may discontinue TWA monitoring for those employees whose exposures are represented by such monitoring.

(c) If the initial monitoring required by subsection (2)(a) of this section reveals the employee exposure to be at or below the excursion limit, the employer may discontinue excursion limit monitoring for those employees whose exposures are represented by the initial monitoring.

(d) If the periodic monitoring required by subsection (3) of this section reveals that employee exposures, as indicated by at least two consecutive measurements taken at least seven days apart, are at or below the excursion limit, the employer may discontinue excursion limit monitoring for those employees whose exposures are represented by such monitoring.

(5) Additional monitoring. Notwithstanding the provisions of subsection (4) of this section, the employer shall institute the exposure monitoring required under subsections (2)(a) and (3) of this section whenever there has been a change in the production, process, control equipment, personnel or work practices that may result in new or additional exposures to EtO or when the employer has any reason to suspect that a change may result in new or additional exposures.

(6) Accuracy of monitoring.

(a) Monitoring shall be accurate, to a confidence level of ninety-five percent, to within plus or minus twenty-five percent for airborne concentrations of EtO at the 1 ppm TWA and to within plus or minus thirty-five percent for airborne concentrations of EtO at the action level of 0.5 ppm.

(b) Monitoring shall be accurate, to a confidence level of ninety-five percent, to within plus or minus thirty-five percent for airborne concentrations of EtO at the excursion limit.

(7) Employee notification of monitoring results.

(a) The employer shall, within fifteen working days after the receipt of the results of any monitoring performed under WAC 296-62-07355 through 296-62-07389, notify the affected employee of these results in writing either individually or by posting of results in an appropriate location that is accessible to affected employees.

(b) The written notification required by (a) of this subsection shall contain the corrective action being taken by the employer to reduce employee exposure to or below the TWA and/or excursion limit, wherever monitoring results indicated that the TWA and/or excursion limit has been exceeded.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-62-07361, filed 11/14/88; 87-24-051 (Order 87-24), § 296-62-07361, filed 11/30/87.]

WAC 296-62-07363 Regulated areas. (1) The employer shall establish a regulated area wherever occupational exposures to airborne concentrations of EtO may exceed the TWA or wherever the EtO concentration exceeds or can reasonably be expected to exceed the excursion limit.

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

(3) Regulated areas shall be demarcated in any manner that minimizes the number of employees within the regulated area.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-62-07363, filed 11/14/88; 87-24-051 (Order 87-24), § 296-62-07363, filed 11/30/87.]

WAC 296-62-07365 Methods of compliance. (1) Engineering controls and work practices.

(a) The employer shall institute engineering controls and work practices to reduce and maintain employee exposure to or below the TWA and to or below the excursion limit, except to the extent that such controls are not feasible.

(b) Wherever the feasible engineering controls and work practices that can be instituted are not sufficient to reduce employee exposure to or below the TWA and to or below the excursion limit, the employer shall use them to reduce employee exposure to the lowest levels achievable by these controls and shall supplement them by the use of respiratory protection that complies with the requirements of WAC 296-62-07367.

(c) Engineering controls are generally infeasible for the following operations: Collection of quality assurance sampling from sterilized materials; removal of biological indicators from sterilized materials; Loading and unloading of tank cars; changing of ethylene oxide tanks on sterilizers; and vessel cleaning. For these operations, engineering controls are required only where the director demonstrates that such controls are feasible.

(2) Compliance program.

(a) Where the TWA or excursion limit is exceeded, the employer shall establish and implement a written program to reduce employee exposure to or below the TWA and to or below the excursion limit by means of

engineering and work practice controls, as required by subsection (1) of this section, and by the use of respiratory protection where required or permitted under WAC 296-62-07355 through 296-62-07389.

(b) The compliance program shall include a schedule for periodic leak detection surveys and a written plan for emergency situations, as specified in WAC 296-62-07369 (1)(a).

(c) Written plans for a program required in this subsection shall be developed and furnished upon request for examination and copying to the director, affected employees and designated employee representatives. Such plans shall be reviewed at least every twelve months, and shall be updated as necessary to reflect significant changes in the status of the employer's compliance program.

(d) The employer shall not implement a schedule of employee rotation as a means of compliance with the TWA or excursion limit.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-62-07365, filed 11/14/88; 87-24-051 (Order 87-24), § 296-62-07365, filed 11/30/87.]

WAC 296-62-07367 Respiratory protection and personal protective equipment. (1) General. The employer shall provide respirators, and ensure that they are used, where required by WAC 296-62-07355 through 296-62-07389. Respirators shall be used in the following circumstances.

(a) During the interval necessary to install or implement feasible engineering and work practice controls;

(b) In work operations, such as maintenance and repair activities, vessel cleaning, or other activities for which engineering and work practice controls are not feasible;

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

(d) In emergencies.

(2) Respirator selection.

(a) Where respirators are required under WAC 296-62-07355 through 296-62-07389, the employer shall select and provide, at no cost to the employee, the appropriate respirator as specified in Table 1, and shall ensure that the employee uses the respirator provided.

(b) The employer shall select respirators from among those jointly approved as being acceptable for protection against EtO by the Mine Safety and Health Administration (MSHA) and by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11.

(3) Respirator program. Where respiratory protection is required by WAC 296-62-07355 through 296-62-07389, the employer shall institute a respirator program in accordance with WAC 296-62-071.

(4) Protective clothing and equipment. Where eye or skin contact with liquid EtO or EtO solutions may occur, the employer shall select and provide, at no cost to the employee, appropriate protective clothing or other equipment in accordance with WAC 296-24-07501 and 296-24-07801 and to protect any area of the body that

may come in contact with liquid EtO or EtO in solution, and shall ensure that the employee wears the protective clothing and equipment provided.

[Statutory Authority: Chapter 49.17 RCW, 88-23-054 (Order 88-25), § 296-62-07367, filed 11/14/88; 87-24-051 (Order 87-24), § 296-62-07367, filed 11/30/87.]

WAC 296-62-07369 Emergency situations. (1) Written plan.

(a) A written plan for emergency situations shall be developed for each workplace where there is a possibility of an emergency. Appropriate portions of the plan shall be implemented in the event of an emergency.

(b) The plan shall specifically provide that employees engaged in correcting emergency conditions shall be equipped with respiratory protection as required by WAC 296-62-07367 until the emergency is abated.

(c) The plan shall include the elements prescribed in WAC 296-24-567, "Employee emergency plans and fire prevention plans."

(2) Alerting employees. Where there is the possibility of employee exposure to EtO due to an emergency, means shall be developed to alert potentially affected employees of such occurrences promptly. Affected employees shall be immediately evacuated from the area in the event that an emergency occurs.

Table 1.—Minimum Requirements for Respiratory Protection for Airborne EtO

Condition of use or concentration of airborne EtO (ppm)	Minimum required respirator
Equal to or less than 50.	(a) Full facepiece respirator with EtO approved canister, front-or back-mounted.
Equal to or less than 2,000.	(a) Positive-pressure supplied air respirator, equipped with full facepiece, hood, or helmet, or (b) Continuous-flow supplied air respirator (positive pressure) equipped with hood, helmet or suit.
Concentration above 2,000 or unknown concentration (such as in emergencies).	(a) Positive-pressure self-contained breathing apparatus (SCBA), equipped with full facepiece, or (b) Positive-pressure full facepiece supplied air respirator equipped with an auxiliary positive-pressure self-contained breathing apparatus.
Firefighting	(a) Positive pressure self-contained breathing apparatus equipped with full facepiece.
Escape	(a) Any respirator described above.

Note.—Respirators approved for use in higher concentrations are permitted to be used in lower concentrations.

[Statutory Authority: Chapter 49.17 RCW, 87-24-051 (Order 87-24), § 296-62-07369, filed 11/30/87.]

WAC 296-62-07371 Medical surveillance. (1) General.

(a) Employees covered.

(i) The employer shall institute a medical surveillance program for all employees who are or may be exposed to EtO at or above the action level, without regard to the use of respirators, for at least thirty days a year.

(ii) The employer shall make available medical examinations and consultations to all employees who have been exposed to EtO in an emergency situation.

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

(2) Medical examinations and consultations.

(a) Frequency. The employer shall make available medical examinations and consultations to each employee covered under subsection (1)(a) of this section on the following schedules:

(i) Prior to assignment of the employee to an area where exposure may be at or above the action level for at least thirty days a year.

(ii) At least annually each employee exposed at or above the action level for at least thirty days in the past year.

(iii) At termination of employment or reassignment to an area where exposure to EtO is not at or above the action level for at least thirty days a year.

(iv) As medically appropriate for any employee exposed during an emergency.

(v) As soon as possible, upon notification by an employee either (A) that the employee has developed signs or symptoms indicating possible overexposure to EtO, or (B) that the employee desires medical advice concerning the effects of current or past exposure to EtO on the employee's ability to produce a healthy child.

(vi) If the examining physician determines that any of the examinations should be provided more frequently than specified, the employer shall provide such examinations to affected employees at the frequencies recommended by the physician.

(b) Content.

(i) Medical examinations made available pursuant to (a)(i) through (iv) of this subsection shall include:

(A) A medical and work history with special emphasis directed to symptoms related to the pulmonary, hematologic, neurologic, and reproductive systems and to the eyes and skin.

(B) A physical examination with particular emphasis given to the pulmonary, hematologic, neurologic, and reproductive systems and to the eyes and skin.

(C) A complete blood count to include at least a white cell count (including differential cell count), red cell count, hematocrit, and hemoglobin.

(D) Any laboratory or other test which the examining physician deems necessary by sound medical practice.

(ii) The content of medical examinations or consultation made available pursuant to (a)(i)(v) of this subsection shall be determined by the examining physician, and shall include pregnancy testing or laboratory evaluation of fertility, if requested by the employee and deemed appropriate by the physician.

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

(a) A copy of WAC 296-62-07355 through 296-62-07389.

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

(c) The employee's representative exposure level or anticipated exposure level.

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

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

(4) Physician's written opinion.

(a) The employer shall obtain a written opinion from the examining physician. This written opinion shall contain the results of the medical examination and shall include:

(i) The physician's opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of material health impairment from exposure to EtO;

(ii) Any recommended limitations on the employee or upon the use of personal protective equipment such as clothing or respirators; and

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

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

(c) The employer shall provide a copy of the physician's written opinion to the affected employee within fifteen days from its receipt.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07371, filed 11/30/87.]

WAC 296-62-07373 Communication of EtO hazards to employees. (1) Signs and labels.

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

DANGER
ETHYLENE OXIDE
CANCER HAZARD AND REPRODUCTIVE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING MAY BE
REQUIRED
TO BE WORN IN THIS AREA

(b) The employer shall ensure that precautionary labels are affixed to all containers of EtO whose contents are capable of causing employee exposure at or above the action level or whose contents may reasonably be foreseen to cause employee exposure above the excursion limit, and that the labels remain affixed when the containers of EtO leave the workplace. For the purpose of this subsection, reaction vessels, storage tanks, and pipes or piping systems are not considered to be containers. The labels shall comply with the requirements of WAC

296-62-05411 of WISHA's hazard communication standard, and shall include the following legend:

(i)

DANGER
CONTAINS ETHYLENE OXIDE
CANCER HAZARD AND REPRODUCTIVE HAZARD; and

(ii) A warning statement against breathing airborne concentrations of EtO.

(c) The labeling requirements under WAC 296-62-07355 through 296-62-07389 do not apply where EtO is used as a pesticide, as such term is defined in the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 et seq.), when it is labeled pursuant to that act and regulations issued under that act by the Environmental Protection Agency.

(2) Material safety data sheets. Employers who are manufacturers or importers of EtO shall comply with the requirements regarding development of material safety data sheets as specified in WAC 296-62-05413 of the hazard communication standard.

(3) Information and training.

(a) The employer shall provide employees who are potentially exposed to EtO at or above the action level or above the excursion limit with information and training on EtO at the time of initial assignment and at least annually thereafter.

(b) Employees shall be informed of the following:

(i) The requirements of WAC 296-62-07353 through 296-62-07389 with an explanation of its contents, including Appendices A and B;

(ii) Any operations in their work area where EtO is present;

(iii) The location and availability of the written EtO final rule; and

(iv) The medical surveillance program required by WAC 296-62-07371 with an explanation of the information in Appendix C.

(c) Employee training shall include at least:

(i) Methods and observations that may be used to detect the presence or release of EtO in the work area (such as monitoring conducted by the employer, continuous monitoring devices, etc.);

(ii) The physical and health hazards of EtO;

(iii) The measures employees can take to protect themselves from hazards associated with EtO exposure, including specific procedures the employer has implemented to protect employees from exposure to EtO, such as work practices, emergency procedures, and personal protective equipment to be used; and

(iv) The details of the hazard communication program developed by the employer, including an explanation of the labeling system and how employees can obtain and use the appropriate hazard information.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-62-07373, filed 11/14/88; 87-24-051 (Order 87-24), § 296-62-07373, filed 11/30/87.]

WAC 296-62-07375 Recordkeeping. (1) Objective data for exempted operations.

(a) Where the processing, use, or handling of products made from or containing EtO are exempted from other requirements of WAC 296-62-07355 through 296-62-07389 under WAC 296-62-07355, or where objective data have been relied on in lieu of initial monitoring under WAC 296-62-07361 (2)(b), the employer shall establish and maintain an accurate record of objective data reasonably relied upon in support of the exemption.

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

- (i) The product qualifying for exemption;
- (ii) The source of the objective data;
- (iii) The testing protocol, results of testing, and/or analysis of the material for the release of EtO;
- (iv) A description of the operation exempted and how the data support the exemption; and
- (v) Other data relevant to the operations, materials, processing, or employee exposures covered by the exemption.

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

(2) Exposure measurements.

(a) The employer shall keep an accurate record of all measurements taken to monitor employee exposure to EtO as prescribed in WAC 296-62-07361.

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

- (i) The date of measurement;
- (ii) The operation involving exposure to EtO which is being monitored;
- (iii) Sampling and analytical methods used and evidence of their accuracy;
- (iv) Number, duration, and results of samples taken;
- (v) Type of protective devices worn, if any; and
- (vi) Name, Social Security number and exposure of the employees whose exposures are represented.

(c) The employer shall maintain this record for at least thirty years, in accordance with WAC 296-62-05207.

(3) Medical surveillance.

(a) The employer shall establish and maintain an accurate record for each employee subject to medical surveillance by WAC 296-62-07371 (1)(a), in accordance with WAC 296-62-05207.

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

- (i) The name and Social Security number of the employee;
- (ii) Physicians' written opinions;
- (iii) Any employee medical complaints related to exposure to EtO; and
- (iv) A copy of the information provided to the physician as required by WAC 296-62-07371(3).

(c) The employer shall ensure that this record is maintained for the duration of employment plus thirty years, in accordance with WAC 296-62-05207.

(4) Availability.

(a) The employer, upon written request, shall make all records required to be maintained by WAC 296-62-

07355 through 296-62-07389 available to the director for examination and copying.

(b) The employer, upon request, shall make any exemption and exposure records required by WAC 296-62-07377 (1) and (2) available for examination and copying to affected employees, former employees, designated representatives and the director, in accordance with WAC 296-62-05201 through 296-62-05209 and 296-62-05213 through 296-62-05217.

(c) The employer, upon request, shall make employee medical records required by subsection (3) of this section available for examination and copying to the subject employee, anyone having the specific written consent of the subject employee, and the director, in accordance with WAC 296-62-052.

(5) Transfer of records.

(a) The employer shall comply with the requirements concerning transfer of records set forth in WAC 296-62-05215.

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

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07375, filed 11/30/87.]

WAC 296-62-07377 Observation of monitoring. (1)

Employee observation. The employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to EtO conducted in accordance with WAC 296-62-07361.

(2) Observation procedures. When observation of the monitoring of employee exposure to EtO requires entry into an area where the use of protective clothing or equipment is required, the observer shall be provided with and be required to use such clothing and equipment and shall comply with all other applicable safety and health procedures.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07377, filed 11/30/87.]

WAC 296-62-07379 Dates. (1) Effective date.

(a) WAC 296-62-07355 through 296-62-07389 shall become effective thirty days after filing with the code reviser.

(b) The requirements in the amended subsections in this section which pertain only to or are triggered by the excursion limit shall become effective December 30, 1988.

(2) Start-up dates.

(a) The requirements of WAC 296-62-07359 through 296-62-07377, including feasible work practice controls but not including engineering controls specified in WAC 296-62-07365(1), shall be complied with within one hundred eighty days after the effective date of WAC 296-62-07355 through 296-62-07389.

(b) Engineering controls specified by WAC 296-62-07365(1) shall be implemented within one year after the

effective date of WAC 296-62-07355 through 296-62-07389.

(c) Compliance with the excursion limit requirements in this section shall be by March 30, 1989, except that implementation of engineering controls specified for compliance with excursion limit shall be by June 30, 1989.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-62-07379, filed 11/14/88; 87-24-051 (Order 87-24), § 296-62-07379, filed 11/30/87.]

WAC 296-62-07381 Appendices. The information contained in the appendices is not intended by itself to create any additional obligations not otherwise imposed or to detract from any existing obligation.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07381, filed 11/30/87.]

WAC 296-62-07383 Appendix A--Substance safety data sheet for ethylene oxide (nonmandatory). (1) Substance identification

(a) Substance: Ethylene oxide (C₂H₄O).

(b) Synonyms: Dihydrooxirene, dimethylene oxide, EO, 1,2-epoxyethane, EtO, ETO, oxacyclopropane, oxane, oxidoethane, alpha/beta-oxidoethane, oxiran, oxirane.

(c) Ethylene oxide can be found as a liquid or vapor.

(d) EtO is used in the manufacture of ethylene glycol, surfactants, ethanalamines, glycol ethers, and other organic chemicals. EtO is also used as a sterilant and fumigant.

(e) Appearance and odor: Colorless liquid below 10.7°C (51.3°F) or colorless gas with ether-like odor detected at approximately 700 parts EtO per million parts of air (700 ppm).

(f) Permissible exposure: Exposure may not exceed 1 part EtO per million parts of air averaged over the 8-hour work day.

(2) Health hazard data

(a) Ethylene oxide can cause bodily harm if you inhale the vapor, if it comes into contact with your eyes or skin, or if you swallow it.

(b) Effects of overexposure:

(i) Ethylene oxide in liquid form can cause eye irritation and injury to the cornea, frostbite, and severe irritation and blistering of the skin upon prolonged or confined contact. Ingestion of EtO can cause gastric irritation and liver injury. Acute effects from inhalation of EtO vapors include respiratory irritation and lung injury, headache, nausea, vomiting, diarrhea, shortness of breath, and cyanosis (blue or purple coloring of skin). Exposure has also been associated with the occurrence of cancer, reproductive effects, mutagenic changes, neurotoxicity, and sensitization.

(ii) EtO has been shown to cause cancer in laboratory animals and has been associated with higher incidences of cancer in humans. Adverse reproductive effects and chromosome damage may also occur from EtO exposure.

(c) Reporting signs and symptoms: You should inform your employer if you develop any signs or symptoms and suspect that they are caused by exposure to EtO.

(3) Emergency first aid procedures

(a) Eye exposure: If EtO gets into your eyes, wash your eyes immediately with large amounts of water, lifting the lower and upper eyelids. Get medical attention immediately. Contact lenses should not be worn when working with this chemical.

(b) Skin exposure: If EtO gets on your skin, immediately wash the contaminated skin with water. If EtO soaks through your clothing, especially your shoes, remove the clothing immediately and wash the skin with water using an emergency deluge shower. Get medical attention immediately. Thoroughly wash contaminated clothing before reusing. Contaminated leather shoes or other leather articles should not be reused and should be discarded.

(c) Inhalation: If large amounts of EtO are inhaled, the exposed person must be moved to fresh air at once. If breathing has stopped, perform cardiopulmonary resuscitation. Keep the affected person warm and at rest. Get medical attention immediately.

(d) Swallowing: When EtO has been swallowed, give the person large quantities of water immediately. After the water has been swallowed, try to get the person to vomit by having him or her touch the back of the throat with his or her finger. Do not make an unconscious person vomit. Get medical attention immediately.

(e) Rescue: Move the affected person from the hazardous exposure. If the exposed person has been overcome, attempt rescue only after notifying at least one other person of the emergency and putting into effect established emergency procedures. Do not become a casualty yourself. Understand your emergency rescue procedures and know the location of the emergency equipment before the need arises.

(4) Respirators and protective clothing

(a) Respirators:

(i) You may be required to wear a respirator for non-routine activities, in emergencies, while your employer is in the process of reducing EtO exposure through engineering controls, and where engineering controls are not feasible. As of the effective date of the standard, only air supplied positive-pressure, full-facepiece respirators are approved for protection against EtO. If air-purifying respirators are worn in the future, they must have a joint Mine Safety and Health Administration (MSHA) and National Institute for Occupational Safety and Health (NIOSH) label of approval for use with ethylene oxide. For effective protection, respirators must fit your face and head snugly. Respirators should not be loosened or removed in work situations where their use is required.

(ii) EtO does not have a detectable odor except at levels well above the permissible exposure limits. If you can smell EtO while wearing a respirator, proceed immediately to fresh air. If you experience difficulty breathing while wearing a respirator, tell your employer.

(b) Protective clothing:

(i) You may be required to wear impermeable clothing, gloves, a face shield, or other appropriate protective

clothing to prevent skin contact with liquid EtO or EtO-containing solutions. Where protective clothing is required, your employer must provide clean garments to you as necessary to assure that the clothing protects you adequately.

(ii) Replace or repair protective clothing that has become torn or otherwise damaged.

(iii) EtO must never be allowed to remain on the skin. Clothing and shoes which are not impermeable to EtO should not be allowed to become contaminated with EtO, and if they do, the clothing should be promptly removed and decontaminated. Contaminated leather shoes should be discarded. Once EtO penetrates shoes or other leather articles, they should not be worn again.

(c) Eye protection: You must wear splashproof safety goggles in areas where liquid EtO or EtO-containing solutions may contact your eyes. In addition, contact lenses should not be worn in areas where eye contact with EtO can occur.

(5) Precautions for safe use, handling, and storage

(a) EtO is a flammable liquid, and its vapors can easily form explosive mixtures in air.

(b) EtO must be stored in tightly closed containers in a cool, well-ventilated area, away from heat, sparks, flames, strong oxidizers, alkalines, and acids, strong bases, acetylide forming metals such as copper, silver, mercury and their alloys.

(c) Sources of ignition such as smoking material, open flames and some electrical devices are prohibited wherever EtO is handled, used, or stored in a manner that could create a potential fire or explosion hazard.

(d) You should use nonsparking tools when opening or closing metal containers of EtO, and containers must be bonded and grounded in the rare instances in which liquid EtO is poured or transferred.

(e) Impermeable clothing wet with liquid EtO or EtO-containing solutions may be easily ignited. If you are wearing impermeable clothing and are splashed with liquid EtO or EtO-containing solution, you should immediately remove the clothing while under an emergency deluge shower.

(f) If your skin comes into contact with liquid EtO or EtO-containing solutions, you should immediately remove the EtO using an emergency deluge shower.

(g) You should not keep food, beverages, or smoking materials in regulated areas where employee exposures are above the permissible exposure limits.

(h) Fire extinguishers and emergency deluge showers for quick drenching should be readily available, and you should know where they are and how to operate them.

(i) Ask your supervisor where EtO is used in your work area and for any additional plant safety and health rules.

(6) Access to information

(a) Each year, your employer is required to inform you of the information contained in this standard and appendices for EtO. In addition, your employer must instruct you in the proper work practices for using EtO emergency procedures, and the correct use of protective equipment.

(b) Your employer is required to determine whether you are being exposed to EtO. You or your representative has the right to observe employee measurements and to record the results obtained. Your employer is required to inform you of your exposure. If your employer determines that you are being overexposed, he or she is required to inform you of the actions which are being taken to reduce your exposure to within permissible exposure limits.

(c) Your employer is required to keep records of your exposures and medical examinations. These exposure records must be kept by the employer for at least thirty years. Medical records must be kept for the period of your employment plus thirty years.

(d) Your employer is required to release your exposure and medical records to your physician or designated representative upon your written request.

(7) Sterilant use of EtO in hospitals and health care facilities.

(a) This section of Appendix A, for informational purposes, sets forth EPA's recommendations for modifications in workplace design and practice in hospitals and health care facilities for which the Environmental Protection Agency has registered EtO for uses as a sterilant or fumigant under the Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. 136 *et seq.* These new recommendations, published in the **Federal Register** by EPA at 49 FR 15268, as modified in today's **Register**, are intended to help reduce the exposure of hospital and health care workers to EtO to 1 ppm. EPA's recommended workplace design and workplace practice are as follows:

(i) Workplace design

(A) Installation of gas line hand valves. Hand valves must be installed on the gas supply line at the connection to the supply cylinders to minimize leakage during cylinder change.

(B) Installation of capture boxes. Sterilizer operations result in a gas/water discharge at the completion of the process. This discharge is routinely piped to a floor drain which is generally located in an equipment or an adjacent room. When the floor drain is not in the same room as the sterilizer and workers are not normally present, all that is necessary is that the room be well ventilated.

(C) The installation of a "capture box" will be required for those work place layouts where the floor drain is located in the same room as the sterilizer or in a room where workers are normally present. A "capture box" is a piece of equipment that totally encloses the floor drain where the discharge from the sterilizer is pumped. The "capture box" is to be vented directly to a nonrecirculating or dedicated ventilation system. Sufficient air intake should be allowed at the bottom of the box to handle the volume of air that is ventilated from the top of the box. The "capture box" can be made of metal, plastic, wood or other equivalent material. The box is intended to reduce levels of EtO discharged into the work room atmosphere. The use of a "capture box" is not required if: (I) The vacuum pump discharge floor drain is located in a well ventilated equipment or other room where workers are not normally present or (II) the

water sealed vacuum pump discharges directly to a closed sealed sewer line (check local plumbing codes).

(D) If it is impractical to install a vented "capture box" and a well ventilated equipment or other room is not feasible, a box that can be sealed over the floor drain may be used if: (I) The floor drain is located in a room where workers are not normally present and EtO cannot leak into an occupied area, and (II) the sterilizer in use is less than 12 cubic feet in capacity (check local plumbing codes).

(ii) Ventilation of aeration units.

(A) Existing aeration units. Existing units must be vented to a nonrecirculating or dedicated system or vented to an equipment or other room where workers are not normally present and which is well ventilated. Aerator units must be positioned as close as possible to the sterilizer to minimize the exposure from the off-gassing of sterilized items.

(B) Installation of new aerator units (where none exist). New aerator units must be vented as described above for existing aerators. Aerators must be in place by July 1, 1986.

(iii) Ventilation during cylinder change. Workers may be exposed to short but relatively high levels of EtO during the change of gas cylinders. To reduce exposure from this route, users must select one of three alternatives designed to draw off gas that may be released when the line from the sterilizer to the cylinder is disconnected:

(A) Location of cylinders in a well ventilated equipment room or other room where workers are not normally present.

(B) Installation of a flexible hose (at least four inches in diameter) to a nonrecirculating or dedicated ventilation system and located in the area of cylinder change in such a way that the hose can be positioned at the point where the sterilizer gas line is disconnected from the cylinder.

(C) Installation of a hood that is part of a nonrecirculating or dedicated system and positioned no more than one foot above the point where the change of cylinders takes place.

(iv) Ventilation of sterilizer door area. One of the major sources of exposure to EtO occurs when the sterilizer door is opened following the completion of the sterilization process. In order to reduce this avenue of exposure, a hood or metal canopy closed on each end must be installed over the sterilizer door. The hood or metal canopy must be connected to a nonrecirculating or dedicated ventilation system or one that exhausts gases to a well ventilated equipment or other room where workers are not normally present. A hood or canopy over the sterilizer door is required for use even with those sterilizers that have a purge cycle and must be in place by July 1, 1986.

(v) Ventilation of sterilizer relief valve. Sterilizers are typically equipped with a safety relief device to release gas in case of increased pressure in the sterilizer. Generally, such relief devices are used on pressure vessels. Although these pressure relief devices are rarely opened for hospital and health care sterilizers, it is suggested that

they be designed to exhaust vapor from the sterilizer by one of the following methods:

(A) Through a pipe connected to the outlet of the relief valve ventilated directly outdoors at a point high enough to be away from passers by, and not near any windows that open, or near any air conditioning or ventilation air intakes.

(B) Through a connection to an existing or new nonrecirculating or dedicated ventilation system.

(C) Through a connection to a well ventilated equipment or other room where workers are not normally present.

(vi) Ventilation systems. Each hospital and health care facility affected by this notice that uses EtO for the sterilization of equipment and supplies must have a ventilation system which enables compliance with the requirements of (a)(i)(B) through (v) of this subsection in the manner described in these sections and within the timeframes allowed. Thus, each affected hospital and health care facility must have or install a nonrecirculating or dedicated ventilation equipment or other room where workers are not normally present in which to vent EtO.

(vii) Installation of alarm systems. An audible and visual indicator alarm system must be installed to alert personnel of ventilation system failures, i.e., when the ventilation fan motor is not working.

(b) Workplace practices

(i) All the workplace practices discussed in this unit must be permanently posted near the door of each sterilizer prior to use by any operator.

(ii) Changing of supply line filters.

Filters in the sterilizer liquid line must be changed when necessary, by the following procedure:

(A) Close the cylinder valve and the hose valve.

(B) Disconnect the cylinder hose (piping) from the cylinder.

(C) Open the hose valve and bleed slowly into a proper ventilating system at or near the in-use supply cylinders.

(D) Vacate the area until the line is empty.

(E) Change the filter.

(F) Reconnect the lines and reverse the valve position.

(G) Check hoses, filters, and valves for leaks with a fluorocarbon leak detector (for those sterilizers using the eighty-eight percent chlorofluorocarbon, twelve percent ethylene oxide mixture (12/88)).

(iii) Restricted access area.

(A) Areas involving use of EtO must be designated as restricted access areas. They must be identified with signs or floor marks near the sterilizer door, aerator, vacuum pump floor drain discharge, and in-use cylinder storage.

(B) All personnel must be excluded from the restricted area when certain operations are in progress, such as discharging a vacuum pump, emptying a sterilizer liquid line, or venting a nonpurge sterilizer with the door ajar or other operations where EtO might be released directly into the face of workers.

(iv) Door opening procedures.

(A) Sterilizers with purge cycles. A load treated in a sterilizer equipped with a purge cycle should be removed immediately upon completion of the cycle (provided no time is lost opening the door after cycle is completed). If this is not done, the purge cycle should be repeated before opening door.

(B) Sterilizers without purge cycles. For a load treated in a sterilizer not equipped with a purge cycle, the sterilizer door must be ajar six inches for fifteen minutes, and then fully opened for at least another fifteen minutes before removing the treated load. The length of time of the second period should be established by peak monitoring for one hour after the two fifteen-minute periods suggested. If the level is above 10 ppm time-weighted average for eight hours, more time should be added to the second waiting period (door wide open). However, in no case may the second period be shortened to less than fifteen minutes.

(v) **Chamber unloading procedures.**

(A) Procedures for unloading the chamber must include the use of baskets or rolling carts, or baskets and rolling tables to transfer treated loads quickly, thus avoiding excessive contact with treated articles, and reducing the duration of exposures.

(B) If rolling carts are used, they should be pulled not pushed by the sterilizer operators to avoid offgassing exposure.

(vi) Maintenance. A written log should be instituted and maintained documenting the date of each leak detection and any maintenance procedures undertaken. This is a suggested use practice and is not required.

(vii) Leak detection. Sterilizer door gaskets, cylinder and vacuum piping, hoses, filters, and valves must be checked for leaks under full pressure with a Fluorocarbon leak detector (for 12/88 systems only) every two weeks by maintenance personnel. Also, the cylinder piping connections must be checked after changing cylinders. Particular attention in leak detection should be given to the automatic solenoid valves that control the flow of EtO to the sterilizer. Specifically, a check should be made at the EtO gasline entrance port to the sterilizer, while the sterilizer door is open and the solenoid valves are in a closed position.

(viii) Maintenance procedures. Sterilizer/aerator door gaskets, valves, and fittings must be replaced when necessary as determined by maintenance personnel in their biweekly checks; in addition, visual inspection of the door gaskets for cracks, debris, and other foreign substances should be conducted daily by the operator.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-62-07383, filed 7/6/88; 87-24-051 (Order 87-24), § 296-62-07383, filed 11/30/87.]

WAC 296-62-07385 Appendix B--Substance technical guidelines for ethylene oxide (nonmandatory). (1) Physical and chemical data:

(a) Substance identification:

(i) Synonyms: Dihydrooxirene, dimethylene oxide, EO, 1,2-epoxyethane, EtO, ETO, oxacyclopropane, oxane, oxidoethane, alpha/beta-oxidoethane, oxiran, oxirane.

(ii) Formula: (C₂H₄O).

(iii) Molecular weight: 44.06.

(b) Physical data:

(i) Boiling point (760 mm Hg): 10.70°C (51.3°F);

(ii) Specific gravity (water = 1): 0.87 (at 20°C or 68°F);

(iii) Vapor density (air = 1): 1.49;

(iv) Vapor pressure (at 20°C): 1,095 mm Hg;

(v) Solubility in water: Complete;

(vi) Appearance and odor: Colorless liquid; gas at temperature above 10.7°F or 51.3°C with ether-like odor above 700 ppm.

(2) Fire, explosion, and reactivity hazard data:

(a) Fire:

(i) Flash point: Less than 0°F (open cup);

(ii) Stability: Decomposes violently at temperatures above 800°F;

(iii) Flammable limits in air, percent by volume: Lower: 3, Upper: 100;

(iv) Extinguishing media: Carbon dioxide for small fires, polymer or alcohol foams for large fires;

(v) Special fire fighting procedures: Dilution of ethylene oxide with 23 volumes of water renders it non-flammable;

(vi) Unusual fire and explosion hazards: Vapors of EtO will burn without the presence of air or other oxidizers. EtO vapors are heavier than air and may travel along the ground and be ignited by open flames or sparks at locations remote from the site at which EtO is being used.

(vii) For purposes of compliance with the requirements of WAC 296-24-330, EtO is classified as a flammable gas. For example, 7,500 ppm, approximately one-fourth of the lower flammable limit, would be considered to pose a potential fire and explosion hazard.

(viii) For purposes of compliance with WAC 296-24-585, EtO is classified as a Class B fire hazard.

(ix) For purpose of compliance with WAC 296-24-956, locations classified as hazardous due to the presence of EtO shall be Class I.

(b) Reactivity:

(i) Conditions contributing to instability: EtO will polymerize violently if contaminated with aqueous alkalis, amines, mineral acids, metal chlorides, or metal oxides. Violent decomposition will also occur at temperatures above 800°F;

(ii) Incompatibilities: Alkalines and acids;

(iii) Hazardous decomposition products: Carbon monoxide and carbon dioxide.

(3) Spill, leak, and disposal procedures:

(a) If EtO is spilled or leaked, the following steps should be taken:

(i) Remove all ignition sources.

(ii) The area should be evacuated at once and re-entered only after the area has been thoroughly ventilated and washed down with water.

(b) Persons not wearing appropriate protective equipment should be restricted from areas of spills or leaks until cleanup has been completed.

(c) Waste disposal method: Waste material should be disposed of in a manner that is not hazardous to employees or to the general population. In selecting the method of waste disposal, applicable local, State, and Federal regulations should be consulted.

(4) Monitoring and Measurement Procedures:

(a) Exposure above the permissible exposure limit:

(i) Eight-hour exposure evaluation: Measurements taken for the purpose of determining employee exposure under this section are best taken with consecutive samples covering the full shift. Air samples should be taken in the employee's breathing zone (air that would most nearly represent that inhaled by the employee.)

(ii) Monitoring techniques: The sampling and analysis under this section may be performed by collection of the EtO vapor on charcoal adsorption tubes or other composition adsorption tubes, with subsequent chemical analysis. Sampling and analysis may also be performed by instruments such as real time continuous monitoring systems, portable direct reading instruments, or passive dosimeters as long as measurements taken using these methods accurately evaluate the concentration of EtO in employees' breathing zones.

(iii) Appendix D describes the validated method of sampling and analysis which has been tested by OSHA for use with EtO. Other available methods are also described in Appendix D. The employer has the obligation of selecting a monitoring method which meets the accuracy and precision requirements of the standard under his/her unique field conditions. The standard requires that the method of monitoring should be accurate, to a 95 percent confidence level, to plus or minus 25 percent for concentrations of EtO at 1 ppm, and to plus or minus 35 percent for concentrations at 0.5 ppm. In addition to the method described in Appendix D, there are numerous other methods available for monitoring for EtO in the workplace. Details on these other methods have been submitted by various companies to the rulemaking record, and are available at the OSHA Docket Office.

(b) Since many of the duties relating to employee exposure are dependent on the results of measurement procedures, employers should assure that the evaluation of employee exposures is performed by a technically qualified person.

(5) Protective clothing and equipment:

(a) Employees should be provided with and be required to wear appropriate protective clothing wherever there is significant potential for skin contact with liquid EtO or EtO-containing solutions. Protective clothing shall include impermeable coveralls or similar full-body work clothing, gloves, and head coverings, as appropriate to protect areas of the body which may come in contact with liquid EtO or EtO-containing solutions.

(b) Employers should ascertain that the protective garments are impermeable to EtO. Permeable clothing, including items made of rubber, and leather shoes should not be allowed to become contaminated with liquid EtO. If permeable clothing does become contaminated, it should be immediately removed, while the employer is under an emergency deluge shower. If leather footwear

or other leather garments become wet from EtO they should be discarded and not be worn again, because leather absorbs EtO and holds it against the skin.

(c) Any protective clothing that has been damaged or is otherwise found to be defective should be repaired or replaced. Clean protective clothing should be provided to the employee as necessary to assure employee protection. Whenever impermeable clothing becomes wet with liquid EtO, it should be washed down with water before being removed by the employee. Employees are also required to wear splashproof safety goggles where there is any possibility of EtO contacting the eyes.

(6) Miscellaneous precautions:

(a) Store EtO in tightly closed containers in a cool, well-ventilated area and take all necessary precautions to avoid any explosion hazard.

(b) Nonsparking tools must be used to open and close metal containers. These containers must be effectively grounded and bonded.

(c) Do not incinerate EtO cartridges, tanks or other containers.

(d) Employers should advise employees of all areas and operations where exposure to EtO occurs.

(7) Common operations:

Common operations in which exposure to EtO is likely to occur include the following: (a) Manufacture of EtO, (b) surfactants, (c) ethanalamines, (d) glycol ethers, (e) specialty chemicals, and (f) use as a sterilant in the hospital, health product and spice industries.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-62-07385, filed 7/6/88; 87-24-051 (Order 87-24), § 296-62-07385, filed 11/30/87.]

WAC 296-62-07387 Appendix C--Medical surveillance guidelines for ethylene oxide (nonmandatory). (1) Route of entry: Inhalation.

(2) Toxicology:

(a) Clinical evidence of adverse effects associated with the exposure to EtO is present in the form of increased incidence of cancer in laboratory animals (leukemia, stomach, brain), mutation in offspring in animals, and resorptions and spontaneous abortions in animals and human populations respectively. Findings in humans and experimental animals exposed to airborne concentrations of EtO also indicate damage to the genetic material (DNA). These include hemoglobin alkylation, unscheduled DNA synthesis, sister chromatid exchange chromosomal aberration, and functional sperm abnormalities.

(b) Ethylene oxide in liquid form can cause eye irritation and injury to the cornea, frostbite, severe irritation, and blistering of the skin upon prolonged or confined contact. Ingestion of EtO can cause gastric irritation and liver injury. Other effects from inhalation of EtO vapors include respiratory irritation and lung injury, headache, nausea, vomiting, diarrhea, dyspnea and cyanosis.

(3) Signs and symptoms of acute overexposure:

(a) The early effects of acute overexposure to EtO are nausea and vomiting, headache, and irritation of the eyes and respiratory passages. The patient may notice a

"peculiar taste" in the mouth. Delayed effects can include pulmonary edema, drowsiness, weakness, and incoordination. Studies suggest that blood cell changes, an increase in chromosomal aberrations, and spontaneous abortion may also be casually related to acute overexposure to EtO.

(b) Skin contact with liquid or gaseous EtO causes characteristic burns and possible even an allergic-type sensitization. The edema and erythema occurring from skin contact with EtO progress to vesiculation with a tendency to coalesce into blebs with desquamation. Healing occurs within three weeks, but there may be a residual brown pigmentation. A 40-80% solution is extremely dangerous, causing extensive blistering after only brief contact. Pure liquid EtO causes frostbite because of rapid evaporation. In contrast, the eye is relatively insensitive to EtO, but there may be some irritation of the cornea.

(c) Most reported acute effects of occupational exposure to EtO are due to contact with EtO in liquid phase. The liquid readily penetrates rubber and leather, and will produce blistering if clothing or footwear contaminated with EtO are not removed.

(4) Surveillance and preventive considerations:

(a) As noted above, exposure to EtO has been linked to an increased risk of cancer and reproductive effects including decreased male fertility, fetotoxicity, and spontaneous abortion. EtO workers are more likely to have chromosomal damage than similar groups not exposed to EtO. At the present, limited studies of chronic effects in humans resulting from exposure to EtO suggest a causal association with leukemia. Animal studies indicate leukemia and cancers at other sites (brain, stomach) as well. The physician should be aware of the findings of these studies in evaluating the health of employees exposed to EtO.

(b) Adequate screening tests to determine an employee's potential for developing serious chronic diseases, such as cancer, from exposure to EtO do not presently exist. Laboratory tests may, however, give evidence to suggest that an employee is potentially overexposed to EtO. It is important for the physician to become familiar with the operating conditions in which exposure to EtO is likely to occur. The physician also must become familiar with the signs and symptoms that indicate a worker is receiving otherwise unrecognized and unacceptable exposure to EtO. These elements are especially important in evaluating the medical and work histories and in conducting the physical exam. When an unacceptable exposure in an active employee is identified by the physician, measures taken by the employer to lower exposure should also lower the risk of serious long-term consequences.

(c) The employer is required to institute a medical surveillance program for all employees who are or will be exposed to EtO at or above the action level (0.5 ppm) for at least 30 days per year, without regard to respirator use. All examinations and procedures must be performed by or under the supervision of a licensed physician at a reasonable time and place for the employee and at no cost to the employee.

(d) Although broad latitude in prescribing specific tests to be included in the medical surveillance program is extended to the examining physician, WISHA requires inclusion of the following elements in the routine examination:

(i) Medical and work histories with special emphasis directed to symptoms related to the pulmonary, hematologic, neurologic, and reproductive systems and to the eyes and skin.

(ii) Physical examination with particular emphasis given to the pulmonary, hematologic, neurologic, and reproductive systems and to the eyes and skin.

(iii) Complete blood count to include at least a white cell count (including differential cell count), red cell count, hematocrit, and hemoglobin.

(iv) Any laboratory or other test which the examining physician deems necessary by sound medical practice.

(e) If requested by the employee, the medical examinations shall include pregnancy testing or laboratory evaluation of fertility as deemed appropriate by the physician.

(f) In certain cases, to provide sound medical advice to the employer and the employee, the physician must evaluate situations not directly related to EtO. For example, employees with skin diseases may be unable to tolerate wearing protective clothing. In addition those with chronic respiratory diseases may not tolerate the wearing of negative pressure (air purifying) respirators. Additional tests and procedures that will help the physician determine which employees are medically unable to wear such respirators should include: An evaluation of cardiovascular function, a baseline chest x-ray to be repeated at five year intervals, and a pulmonary function test to be repeated every three years. The pulmonary function test should include measurement of the employee's forced vital capacity (FVC), forced expiratory volume at one second (FEV1), as well as calculation of the ratios of FEV1 to FVC, and measured FVC and measured FEV1 to expected values corrected for variation due to age, sex, race, and height.

(g) The employer is required to make the prescribed tests available at least annually to employees who are or will be exposed at or above the action level, for 30 or more days per year; more often than specified if recommended by the examining physician; and upon the employee's termination of employment or reassignment to another work area. While little is known about the long-term consequences of high short-term exposures, it appears prudent to monitor such affected employees closely in light of existing health data. The employer shall provide physician recommended examinations to any employee exposed to EtO in emergency conditions. Likewise, the employer shall make available medical consultations including physician recommended exams to employees who believe they are suffering signs or symptoms of exposure to EtO.

(h) The employer is required to provide the physician with the following information: a copy of this standard and its appendices; a description of the affected employee's duties as they relate to the employee exposure level; and information from the employee's previous

medical examinations which is not readily available to the examining physician. Making this information available to the physician will aid in the evaluation of the employee's health in relation to assigned duties and fitness to wear personal protective equipment, when required.

(i) The employer is required to obtain a written opinion from the examining physician containing the results of the medical examinations; the physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of his or her health from exposure to EtO; any recommended restrictions upon the employee's exposure to EtO, or upon the use of protective clothing or equipment such as respirators; and a statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions which require further explanation or treatment. This written opinion must not reveal specific findings or diagnoses unrelated to occupational exposure to EtO, and a copy of the opinion must be provided to the affected employee.

(j) The purpose in requiring the examining physician to supply the employer with a written opinion is to provide the employer with a medical basis to aid in the determination of initial placement of employees and to assess the employee's ability to use protective clothing and equipment.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-62-07387, filed 7/6/88; 87-24-051 (Order 87-24), § 296-62-07387, filed 11/30/87.]

WAC 296-62-07389 Appendix D--Sampling and analytical methods for ethylene oxide (nonmandatory).

(1) A number of methods are available for monitoring employee exposures to EtO. Most of these involve the use of charcoal tubes and sampling pumps, followed by analysis of the samples by gas chromatograph. The essential differences between the charcoal tube methods include, among others, the use of different desorbing solvents, the use of different lots of charcoal, and the use of different equipment for analysis of the samples. Besides charcoal, methods using passive dosimeters, gas sampling bags, impingers, and detector tubes have been utilized for determination of EtO exposure. In addition, there are several commercially available portable gas analyzers and monitoring units. This appendix contains details for the method which has been tested at the OSHA Analytical Laboratory in Salt Lake City. Inclusion of this method in the appendix does not mean that this method is the only one which will be satisfactory. Copies of descriptions of other methods available are available in the rulemaking record, and may be obtained from the OSHA Docket Office. These include the Union Carbide, Dow Chemical, 3M, and DuPont methods, as well as NIOSH Method S-286. These methods are briefly described at the end of this appendix.

(2) Employers who note problems with sample breakthrough using the OSHA or other charcoal methods should try larger charcoal tubes. Tubes of larger capacity are available. In addition, lower flow rates and

shorter sampling times should be beneficial in minimizing breakthrough problems. Whatever method the employer chooses, he/she must assure himself/herself of the method's accuracy and precision under the unique conditions present in his workplace.

(3) Ethylene oxide:

(a) Method No.: 30.

(b) Matrix: Air.

(i) Target concentration: 1.0 ppm (1.8 mg/m³)

(ii) Procedure: Samples are collected on two charcoal tubes in series and desorbed with 1% CS₂ in benzene. The samples are derivatized with HBr and treated with sodium carbonate. Analysis is done by gas chromatography with an electron capture detector.

(iii) Recommended air volume and sampling rate: 1 liter and 0.05 Lpm.

(iv) Detection limit of the overall procedure: 13.3 ppb (0.024 mg/m³) (based on 1.0 liter air sample).

(v) Reliable quantitation limit: 52.2 ppb (0.094 mg/m³) (based on 1.0 liter air sample).

(vi) Standard error of estimate: 6.59% (see backup section 4.6).

(vii) Special requirements: Samples must be analyzed within 15 days of sampling date.

(viii) Status of method: The sampling and analytical method has been subject to the established evaluation procedures of the Organic Method Evaluations Branch.

(c) Date: August 1981.

(d) Chemist: Wayne D. Potter

(e) Organic Solvents Branch, OSHA Analytical Laboratory, Salt Lake City, Utah

(f) General discussion:

(i) Background.

(A) History of procedure.

(I) Ethylene oxide samples analyzed at the OSHA laboratory have normally been collected on activated charcoal and desorbed with carbon disulfide. The analysis is performed with a gas chromatograph equipped with a FID (flame ionization detector) as described in NIOSH Method S286 (Ref. (3)(j)(i)). This method is based on a PEL of 50 ppm and has a detection limit of about 1 ppm.

(II) Recent studies have prompted the need for a method to analyze and detect ethylene oxide at very low concentrations.

(III) Several attempts were made to form an ultraviolet (UV) sensitive derivative with ethylene oxide for analysis with HPLC. Among those tested that gave no detectable product were: p-anisidine, methylimidazole, aniline, and 2,3,6-trichlorobenzoic acid. Each was tested with catalysts such as triethylamine, aluminum chloride, methylene chloride and sulfuric acid but no detectable derivative was produced.

(IV) The next derivatization attempt was to react ethylene oxide with HBr to form 2-bromoethanol. This reaction was successful. An ECD (electron capture detector) gave a very good response for 2-bromoethanol due to the presence of bromine. The use of carbon disulfide as the desorbing solvent gave too large a response and masked the 2-bromoethanol. Several other solvents were tested for both their response on the ECD and their

ability to desorb ethylene oxide from the charcoal. Among those tested were toluene, xylene, ethyl benzene, hexane, cyclohexane and benzene. Benzene was the only solvent tested that gave a suitable response on the ECD and a high desorption. It was found that the desorption efficiency was improved by using 1% CS₂ with the benzene. The carbon disulfide did not significantly improve the recovery with the other solvents. SKC Lot 120 was used in all tests done with activated charcoal.

(B) Physical properties (Ref. (3)(j)(ii) - (iv)):

(I) Synonyms: Oxirane; dimethylene oxide; 1,2-epoxy-ethane; oxane; C₂H₄O; ETO;

(II) Molecular weight: 44.06;

(III) Boiling point: 10.7°C (51.3°);

(IV) Melting point: -111°C;

(V) Description: Colorless, flammable gas;

(VI) Vapor pressure: 1095 mm. at 20°C;

(VII) Odor: Ether-like odor;

(VIII) Lower explosive limits: 3.0% (by volume);

(IX) Flash point (TOC): Below 0°F;

(X) Molecular structure: CH₂-CH₂;

(ii) Limit defining parameters:

(A) Detection limit of the analytical procedure. The detection limit of the analytical procedure is 12.0 picograms of ethylene oxide per injection. This is the amount of analyte which will give a peak whose height is five times the height of the baseline noise. (See backup data section (3)(i)(i).)

(B) Detection limit of the overall procedure.

(I) The detection limit of the overall procedure is 24.0 ng of ethylene oxide per sample.

(II) This is the amount of analyte spiked on the sampling device which allows recovery of an amount of analyte equivalent to the detection limit of the analytical procedure. (See backup data section (3)(i)(ii).)

(C) Reliable quantitation limit.

(I) The reliable quantitation limit is 94.0 nanograms of ethylene oxide per sample. This is the smallest amount of analyte which can be quantitated within the requirements of 75% recovery and 95% confidence limits. (See backup data section (3)(i)(ii).)

(II) It must be recognized that the reliable quantitation limit and detection limits reported in the method are based upon optimization of the instrument for the smallest possible amount of analyte. When the target concentration of an analyte is exceptionally higher than these limits, they may not be attainable at the routine operating parameters. In this case, the limits reported on analysis reports will be based on the operating parameters used during the analysis of the samples.

(D) Sensitivity.

(I) The sensitivity of the analytical procedure over a concentration range representing 0.5 to 2 times the target concentration based on the recommended air volume is 34105 area units per ug/mL. The sensitivity is determined by the slope of the calibration curve (see backup data section (3)(i)(iii)).

(II) The sensitivity will vary somewhat with the particular instrument used in the analysis.

(E) Recovery. The recovery of analyte from the collection medium must be 75% or greater. The average

recovery from spiked samples over the range of 0.5 to 2 times the target concentration is 88.0% (see backup section (3)(i)(iv)). At lower concentrations the recovery appears to be nonlinear.

(F) Precision (analytical method only). The pooled coefficient of variation obtained from replicate determination of analytical standards at 0.5X, 1X and 2X the target concentration is 0.036 (see backup data section (3)(i)(v)).

(G) Precision (overall procedure).

(I) The overall procedure must provide results at the target concentration that are 25% or better at the 95% confidence level. The precision at the 95% confidence level for the 15 day storage test is plus or minus 12.9% (see backup data section (3)(i)(vi)).

(II) This includes an additional plus or minus 5% for sampling error.

(iii) Advantages.

(A) The sampling procedure is convenient.

(B) The analytical procedure is very sensitive and reproducible.

(C) Reanalysis of samples is possible.

(D) Samples are stable for at least 15 days at room temperature.

(E) Interferences are reduced by the longer GC retention time of the new derivative.

(iv) Disadvantages.

(A) Two tubes in series must be used because of possible breakthrough and migration.

(B) The precision of the sampling rate may be limited by the reproducibility of the pressure drop across the tubes. The pumps are usually calibrated for one tube only.

(C) The use of benzene as the desorption solvent increases the hazards of analysis because of the potential carcinogenic effects of benzene.

(D) After repeated injections there can be a buildup of residue formed on the electron capture detector which decreases sensitivity.

(E) Recovery from the charcoal tubes appears to be non-linear at low concentrations.

(g) Sampling procedure.

(i) Apparatus.

(A) A calibrated personal sampling pump whose flow can be determined within plus or minus 5% of the recommended flow.

(B) SKC Lot 120 Charcoal tubes: Glass tube with both ends flame sealed, 7 cm long with a 6 mm O.D. and a 4-mm I.D., containing 2 sections of coconut shell charcoal separated by a 2-mm portion of urethane foam. The adsorbing section contains 100 mg of charcoal, the backup section 50 mg. A 3-mm portion of urethane foam is placed between the outlet end of the tube and the backup section. A plug of silylated glass wool is placed in front of the adsorbing section.

(ii) Reagents.

None required.

(iii) Sampling technique.

(A) Immediately before sampling, break the ends of the charcoal tubes. All tubes must be from the same lot.

(B) Connect two tubes in series to the sampling pump with a short section of flexible tubing. A minimum amount of tubing is used to connect the two sampling tubes together. The tube closer to the pump is used as a backup. This tube should be identified as the backup tube.

(C) The tubes should be placed in a vertical position during sampling to minimize channeling.

(D) Air being sampled should not pass through any hose or tubing before entering the charcoal tubes.

(E) Seal the charcoal tubes with plastic caps immediately after sampling. Also, seal each sample with OSHA seals lengthwise.

(F) With each batch of samples, submit at least one blank tube from the same lot used for samples. This tube should be subjected to exactly the same handling as the samples (break, seal, transport) except that no air is drawn through it.

(G) Transport the samples (and corresponding paperwork) to the lab for analysis.

(H) If bulk samples are submitted for analysis, they should be transported in glass containers with Teflon-lined caps. These samples must be mailed separately from the container used for the charcoal tubes.

(iv) Breakthrough.

The breakthrough (5% breakthrough) volume for a 3.0 mg/m³ ethylene oxide sample stream at approximately 85% relative humidity, 22°C and 633 mm is 2.6 liters sampled at 0.05 liters per minute. This is equivalent to 7.8 µg of ethylene oxide. Upon saturation of the tube it appeared that the water may be displacing ethylene oxide during sampling.

(v) Desorption efficiency.

(A) The desorption efficiency, from liquid injection onto charcoal tubes, averaged 88.0% from 0.5 to 2.0 x the target concentration for a 1.0 liter air sample. At lower ranges it appears that the desorption efficiency is nonlinear (see backup data section (3)(i)(ii)).

(B) The desorption efficiency may vary from one laboratory to another and also from one lot of charcoal to another. Thus, it is necessary to determine the desorption efficiency for a particular lot of charcoal.

(vi) Recommended air volume and sampling rate.

(A) The recommended air volume is 1.0 liter.

(B) The recommended maximum sampling rate is 0.05 Lpm.

(vii) Interferences.

(A) Ethylene glycol and Freon 12 at target concentration levels did not interfere with the collection of ethylene oxide.

(B) Suspected interferences should be listed on the sample data sheets.

(C) The relative humidity may affect the sampling procedure.

(viii) Safety precautions.

(A) Attach the sampling equipment to the employee so that it does not interfere with work performance.

(B) Wear safety glasses when breaking the ends of the sampling tubes.

(C) If possible, place the sampling tubes in a holder so the sharp end is not exposed while sampling.

(h) Analytical method.

(i) Apparatus.

(A) Gas chromatograph equipped with a linearized electron capture detector.

(B) GC column capable of separating the derivative of ethylene oxide (2-bromoethanol) from any interferences and the 1% CS₂ in benzene solvent. The column used for validation studies was: 10 ft x 1/8 inch stainless steel 20% SP-2100, .1% Carbowax 1500 on 100/120 Supelcoport.

(C) An electronic integrator or some other suitable method of measuring peak areas.

(D) Two milliliter vials with Teflon-lined caps.

(E) Gas tight syringe—500 µL or other convenient sizes for preparing standards.

(F) Microliter syringes—10 µL or other convenient sizes for diluting standards and 1 µL for sample injections.

(G) Pipets for dispensing the 1% CS₂ in benzene solvent. The Glenco 1 mL dispenser is adequate and convenient.

(H) Volumetric flasks—5 mL and other convenient sizes for preparing standards.

(I) Disposable Pasteur pipets.

(ii) Reagents.

(A) Benzene, reagent grade.

(B) Carbon disulfide, reagent grade.

(C) Ethylene oxide, 99.7% pure.

(D) Hydrobromic acid, 48% reagent grade.

(E) Sodium carbonate, anhydrous, reagent grade.

(F) Desorbing reagent, 99% Benzene/1% CS₂.

(iii) Sample preparation.

(A) The front and back sections of each sample are transferred to separate 2-mL vials.

(B) Each sample is desorbed with 1.0 mL of desorbing reagent.

(C) The vials are sealed immediately and allowed to desorb for one hour with occasional shaking.

(D) Desorbing reagent is drawn off the charcoal with a disposable pipet and put into clean 2-mL vials.

(E) One drop of HBr is added to each vial. Vials are resealed and HBr is mixed well with the desorbing reagent.

(F) About 0.15 gram of sodium carbonate is carefully added to each vial. Vials are again resealed and mixed well.

(iv) Standard preparation.

(A) Standards are prepared by injecting the pure ethylene oxide gas into the desorbing reagent.

(B) A range of standards are prepared to make a calibration curve. A concentration of 1.0 µL of ethylene oxide gas per 1 mL desorbing reagent is equivalent to 1.0 ppm air concentration (all gas volumes at 25°C and 760 mm) for the recommended 1 liter air sample. This amount is uncorrected for desorption efficiency (see backup data section (3)(i)(ii), for desorption efficiency corrections).

(C) One drop of HBr per mL of standard is added and mixed well.

(D) About 0.15 grams of sodium carbonate is carefully added for each drop of HBr (a small reaction will occur).

(v) Analysis.

(A) GC conditions.

Nitrogen flow rate—10mL/min.

Injector temperature—250°C

Detector temperature—300°C

Column temperature—100°C

Injection size—0.8 μ L

Elution time—3.9 minutes

(B) Peak areas are measured by an integrator or other suitable means.

(C) The integrator results are in area units and a calibration curve is set up with concentration vs. area units.

(vi) Interferences.

(A) Any compound having the same retention time of 2-bromoethanol is a potential interference. Possible interferences should be listed on the sample data sheets.

(B) GC parameters may be changed to circumvent interferences.

(C) There are usually trace contaminants in benzene.

These contaminants, however, posed no problem of interference.

(D) Retention time data on a single column is not considered proof of chemical identity. Samples over the 1.0 ppm target level should be confirmed by GC/Mass Spec or other suitable means.

(vii) Calculations.

(A) The concentration in μ g/mL for a sample is determined by comparing the area of a particular sample to the calibration curve, which has been prepared from analytical standards.

(B) The amount of analyte in each sample is corrected for desorption efficiency by use of a desorption curve.

(C) Analytical results, A, from the two tubes that compose a particular air sample are added together.

(D) The concentration for a sample is calculated by the following equation:

$$\text{ETO, mg/m}^3 = \frac{\text{AXB}}{\text{C}}$$

where:

A = μ g/mL

B = desorption volume in milliliters

C = air volume in liters.

(E) To convert mg/m^3 to parts per million (ppm) the following relationship is used:

$$\text{ETO, ppm} = \frac{\text{mg/m}^3 \times 24.45}{44.05}$$

where:

mg/m^3 = results from 3.7.4

24.45 = molar volume at 25°C and 760mm Hg

44.05 = molecular weight of ETO.

(viii) Safety precaution

(A) Ethylene oxide and benzene are potential carcinogens and care must be exercised when working with these compounds.

(B) All work done with the solvents (preparation of standards, desorption of samples, etc.) should be done in a hood.

(C) Avoid any skin contact with all of the solvents.

(D) Wear safety glasses at all times.

(E) Avoid skin contact with HBr because it is highly toxic and a strong irritant to eyes and skin.

(i) Backup data.

(i) Detection limit data.

The detection limit was determined by injecting 0.8 μ L of a 0.015 μ g/mL standard of ethylene oxide into 1% CS₂ in Benzene. The detection limit of the analytical procedure is taken to be 1.20×10^{-5} μ g per injection. This is equivalent to 8.3 ppb (0.015 mg/m^3) for the recommended air volume.

(ii) Desorption efficiency. Ethylene oxide was spiked into charcoal tubes and the following recovery data was obtained:

Amount spiked (μ g)	Amount recovered (μ g)	Percent recovery
4.5	4.32	96.0
3.0	2.61	87.0
2.25	2.025	90.0
1.5	1.365	91.0
1.5	1.38	92.0
.75	.6525	87.0
.375	.315	84.0
.375	.312	83.2
.1875	.151	80.5
.094	.070	74.5

Note: At lower amounts the recovery appears to be nonlinear.

(iii) Sensitivity data. The following data was used to determine the calibration curve:

Injection	0.5 x .75 μ g/mL	1 x 1.5 μ g/mL	2 x 3.0 μ g/mL
1	30904	59567	111778
2	30987	62914	106016
3	32555	58578	106122
4	32242	57173	109716
X	31672	59558	108408

Slope = 34.105.

(iv) Recovery. The recovery was determined by spiking ethylene oxide onto lot 120 charcoal tubes and desorbing with 1% CS₂ in Benzene. Recoveries were done at 0.5, 1.0, and 2.0 X the target concentration (1 ppm) for the recommended air volume.

Sample	Percent Recovery		
	0.5x	1.0x	2.0x
1	88.7	95.0	91.7
2	83.8	95.0	87.3

Sample	0.5x	1.0x	2.0x
3	84.2	91.0	86.0
4	88.0	91.0	83.0
5	88.0	86.0	85.0
X	86.5	90.5	87.0

Weighted average = 88.2

(v) Precision of the analytical procedure. The following data was used to determine the precision of the analytical method:

Concentration	0.5 x .75 µg/mL	1 x 1.5 µg/mL	2 x 3.0 µg/mL
Injection	.7421	1.4899	3.1184
	.7441	1.5826	3.0447
	.7831	1.4628	2.9149
	.7753	1.4244	2.9185
Average	.7612	1.4899	2.9991
Standard Deviation	.0211	.0674	.0998
CV	.0277	.0452	.0333

$$CV = \frac{3(.0277)^2 + 3(.0452)^2 + 3(.0333)^2}{3 + 3 + 3}$$

CV + 0.036

(vi) Storage data. Samples were generated at 1.5 mg/m³ ethylene oxide at 85% relative humidity, 22°C and 633 mm. All samples were taken for 20 minutes at 0.05 Lpm. Six samples were analyzed as soon as possible and fifteen samples were stored at refrigerated temperature (5°C) and fifteen samples were stored at ambient temperature (23°C). These stored samples were analyzed over a period of nineteen days.

Percent Recovery

Day analyzed	Refrigerated	Ambient
1	87.0	87.0
1	93.0	93.0
1	94.0	94.0
1	92.0	92.0
4	92.0	91.0
4	93.0	88.0
4	91.0	89.0
6	92.0	—
6	92.0	—
8	—	92.0
8	—	86.0
10	91.7	—
10	95.5	—
10	95.7	—
11	—	90.0
11	—	82.0
13	78.0	—
13	81.4	—

Day analyzed	Refrigerated	Ambient
13	82.4	—
14	—	78.5
14	—	72.1
18	66.0	—
18	68.0	—
19	—	64.0
19	—	77.0

(vii) Breakthrough data.

(A) Breakthrough studies were done at 2 ppm (3.6 mg/m³) at approximately 85% relative humidity at 22°C (ambient temperature). Two charcoal tubes were used in series. The backup tube was changed every 10 minutes and analyzed for breakthrough. The flow rate was 0.050 Lpm.

Tube No.	Time (minutes)	Percent breakthrough
1	10	(¹)
2	20	(¹)
3	30	(¹)
4	40	1.23
5	50	3.46
6	60	18.71
7	70	39.2
8	80	53.3
9	90	72.0
10	100	96.0
11	110	113.0
12	120	133.9

¹None.

(B) The 5% breakthrough volume was reached when 2.6 liters of test atmosphere were drawn through the charcoal tubes.

(j) References.

(i) "NIOSH Manual of Analytical Methods," 2nd ed. NIOSH: Cincinnati, 1977; Method S 286.

(ii) "IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Man." International Agency for Research on Cancer: Lyon, 1976; Vol. II, p. 157.

(iii) Sax, N.I. "Dangerous Properties of Industrial Materials," 4th ed.; Van Nostrand Reinhold Company, New York, 1975; p. 741.

(iv) "The Condensed Chemical Dictionary," 9th ed.; Hawley, G.G., ed.; Van Nostrand Reinhold Company, New York, 1977; p. 361.

(4) Summary of other sampling procedures. OSHA believes that several other types of monitoring equipment and techniques exist for monitoring time-weighted averages. Considerable research and method development is currently being performed, which will lead to improvements and a wider variety of monitoring techniques. A combination of monitoring procedures can be

used. There probably is no one best method for monitoring personal exposure to ethylene oxide in all cases. There are advantages, disadvantages, and limitations to each method. The method of choice will depend on the need and requirements. Some commonly used methods include the use of charcoal tubes, passive dosimeters, Tedlar gas sampling bags, detector tubes, photoionization detection units, infrared detection units and gas chromatographs. A number of these methods are described below.

(a) Charcoal tube sampling procedures.

(i) Qazi-Ketcham method (Ex-11-133)—This method consists of collecting EtO on Columbia JXC activated carbon, desorbing the EtO with carbon disulfide and analyzing by gas chromatography with flame ionization detection. Union Carbide has recently updated and revalidated this monitoring procedure. This method is capable of determining both eight-hour time-weighted average exposures and short-term exposures. The method was validated to 0.5 ppm. Like other charcoal collecting procedures, the method requires considerable analytical expertise.

(ii) *ASTM-proposed method*—The Ethylene Oxide Industry Council (EOIC) has contracted with Clayton Environmental Consultants, Inc. to conduct a collaborative study for the proposed method. The ASTM-Proposed method is similar to the method published by Qazi and Ketcham in the November 1977 American Industrial Hygiene Association Journal, and to the method of Pilney and Coyne, presented at the 1979 American Industrial Hygiene Conference. After the air to be sampled is drawn through an activated charcoal tube, the ethylene oxide is desorbed from the tube using carbon disulfide and is quantitated by gas chromatography utilizing a flame ionization detector. The ASTM-proposed method specifies a large two-section charcoal tube, shipment in dry ice, storage at less than -5°C , and analysis within three weeks to prevent migration and sample loss. Two types of charcoal tubes are being tested—Pittsburgh Coconut-Based (PCB) and Columbia JXC charcoal. This collaborative study will give an indication of the inter- and intralaboratory precision and accuracy of the ASTM/proposed method. Several laboratories have considerable expertise using the Qazi-Ketcham and Dow methods.

(b) Passive monitors—Ethylene oxide diffuses into the monitor and is collected in the sampling media. The DuPont Pro-Tek badge collects EtO in an absorbing solution, which is analyzed colorimetrically to determine the amount of EtO present. The 3M 350 badge collects the EtO on chemically treated charcoal. Other passive monitors are currently being developed and tested. Both 3M and DuPont have submitted data indicating their dosimeters meet the precision and accuracy requirements of the proposed ethylene oxide standard. Both presented laboratory validation data to 0.2 ppm (Exs. 11-65, 4-20, 108, 109, 130).

(c) Tedlar gas sampling bags—samples are collected by drawing a known volume of air into a Tedlar gas sampling bag. The ethylene oxide concentration is often determined on-site using a portable gas chromatograph or portable infrared spectrometer.

(d) Detector tubes—A known volume of air is drawn through a detector tube using a small hand pump. The concentration of EtO is related to the length of stain developed in the tube. Detector tubes are economical, easy to use, and give an immediate readout. Unfortunately, partly because they are nonspecific, their accuracy is often questionable. Since the sample is taken over a short period of time, they may be useful for determining the source of leaks.

(e) Direct reading instruments:

(i) There are numerous types of direct reading instruments, each having its own strengths and weaknesses (Exs. 135B, 135C, 107, 11-78, 11-153). Many are relatively new, offering greater sensitivity and specificity. Popular ethylene oxide direct reading instruments include infrared detection units, photoionization detection units, and gas chromatographs.

(ii) Portable infrared analyzers provide an immediate, continuous indication of a concentration value; making them particularly useful for locating high concentration pockets, in leak detection and in ambient air monitoring. In infrared detection units, the amount of infrared light absorbed by the gas being analyzed at selected infrared wavelengths is related to the concentration of a particular component. Various models have either fixed or variable infrared filters, differing cell pathlengths, and microcomputer controls for greater sensitivity, automation, and interference elimination.

(iii) A fairly recent detection system is photoionization detection. The molecules are ionized by high energy ultraviolet light. The resulting current is measured. Since different substances have different ionization potentials, other organic compounds may be ionized. The lower the lamp energy, the better the selectivity. As a continuous monitor, photoionization detection can be useful for locating high concentration pockets, in leak detection, and continuous ambient air monitoring. Both portable and stationary gas chromatographs are available with various types of detectors, including photoionization detectors. A gas chromatograph with a photoionization detector retains the photoionization sensitivity, but minimizes or eliminates interferences. For several GC/PID units, the sensitivity is in the 0.1–0.2 ppm EtO range. The GC/PID with microprocessors can sample up to 20 sample points sequentially, calculate and record data, and activate alarms or ventilation systems. Many are quite flexible and can be configured to meet the specific analysis needs for the workplace.

(iv) **DuPont presented their laboratory validation data of the accuracy of the Qazi-Ketcham charcoal tube, the PCB charcoal tube, Miran 103 IR analyzer, 3M #3550 monitor and the DuPont C-70 badge. Quoting Elbert V. Kring:**

(v) We also believe that OSHA's proposed accuracy in this standard is appropriate. At plus or minus 25 percent at one part per million, and plus or minus 35 percent below that. And, our data indicates there's only one monitoring method, right now, that we've tested thoroughly, that meets that accuracy requirements. That is the DuPont Pro-Tek badge* * *. We also believe that this kind of data should be confirmed by another independent laboratory, using the same type dynamic chamber testing (Tr. 1470).

Additional data by an independent laboratory following their exact protocol was not submitted. However, information was submitted on comparisons and precision and accuracy of those monitoring procedures which indicate far better precision and accuracy of those monitoring procedures than that obtained by DuPont (Ex. 4-20, 130, 11-68, 11-133, 130, 135A)

(vi) The accuracy of any method depends to a large degree upon the skills and experience of those who not only collect the samples but also those who analyze the samples. Even for methods that are collaboratively tested, some laboratories are closer to the true values than others. Some laboratories may meet the precision and accuracy requirements of the method; others may consistently far exceed them for the same method.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-62-07389, filed 7/6/88; 87-24-051 (Order 87-24), § 296-62-07389, filed 11/30/87.]

PART H--AIR CONTAMINANTS

WAC 296-62-07515 Control of chemical agents.
Chemical agents shall be controlled in such a manner that the workers exposure shall not exceed the applicable limits in WAC 296-62-075 through 296-62-07515.

TABLE 1
PERMISSIBLE EXPOSURE LIMITS (PEL)

Substance	ppm (see note a)	mg/M ³ (see note b)
Abate, see Temephos		
Acetaldehyde	100	180
Acetic acid	10	25
C Acetic anhydride	5	20
Acetone	750	1,780
Acetonitrile	40	70
2-Acetylaminofluorene, see WAC 296-62-073		
Acetylene	Simple	Asphyxiant
Acetylene dichloride, see 1,2-Dichloroethylene		
Acetylene tetrabromide	1	15
Acetylsalicylic acid	—	5
Acrolein	0.1	0.25
Acrylamide-skin	—	0.03
Acrylic acid	10	30
Acrylonitrile-skin, see WAC 296-62-07341		
Aldrin-skin	—	0.25
Allyl alcohol-skin	2	5
Allyl chloride	1	3
Allyl propyl disulfide	2	12
α-Alumina, see Aluminum oxide		
Aluminum		
metal and oxide	—	10
pyro powders	—	5
welding fumes	—	5

TABLE 1
PERMISSIBLE EXPOSURE LIMITS (PEL)

Substance	ppm (see note a)	mg/M ³ (see note b)
soluble salts	—	2
alkyls (NOC)	—	2
Alundum, see aluminum oxide		
4-Aminodiphenyl, see WAC 296-62-073		
2-Aminoethanol, see Ethanolamine		
2-Aminopyridine	0.5	2
Ammonia	25	18
Ammonium chloride, fume	—	10
Ammonium sulfamate (Ammate)	—	10
n-Amyl acetate	100	530
sec-Amyl acetate	125	665
Aniline & homologues-skin	2	10
Anisidine (o, p-isomers)-skin	0.1	0.5
Antimony & Compounds (as Sb)	—	0.5
ANTU (alpha Naphthyl thiourea)	—	0.3
Argon	Simple	Asphyxiant
Arsenic & Compounds (as As) which are exempt from WAC 296-62-07347	—	0.2
Arsine	0.05	0.2
Asbestos, see WAC 296-62-07517		
Asphalt (petroleum) fumes	—	5
Atrazine	—	5
Azinphos methyl-skin	—	0.2
Barium (soluble compounds)	—	0.5
Benomyl	0.8	10
Benzidine, see WAC 296-62-073		
p-Benzoquinone, see Quinone		
Benzoyl peroxide	—	5
Benzyl chloride	1	5
Biphenyl, see Diphenyl		
Bismuth telluride	—	10
Se-doped	—	5
Borates, tetra, sodium salts		
anhydrous	—	1
decahydrate	—	5
pentahydrate	—	1
Boron oxide	—	10
Boron tribromide	1	10
C Boron trifluoride	1	3
Bromacil	1	10
Bromine	0.1	0.7
Bromine pentafluoride	0.1	0.7
Bromochloromethane	200	1,050
Bromoform-skin	0.5	5.0
Butadiene (1,3-butadiene)	10	22
Butane	800	1,900
Butanethiol, see Butyl mercaptan		
2-Butanone	200	590
2-Butoxy ethanol (Butyl Cello-solve)-skin	25	120
Butyl acetate (n-butyl acetate)	150	710
sec-Butyl acetate	200	950
tert-Butyl acetate	200	950
Butyl acrylate	10	55
C n-Butyl alcohol-skin	50	150
sec-Butyl alcohol	100	305
tert-Butyl alcohol	100	300
C Butylamine-skin	5	15
C tert-Butyl chromate (as CrO ₃)-skin	—	0.1
n-Butyl glycidyl ether (BGE)	25	135
n-Butyl lactate	5	25
Butyl mercaptan	0.5	1.5
o-sec-Butylphenol-skin	5	30
p-tert-Butyl-toluene	10	60
C Cadmium oxide fume, as Cd	—	0.05
Cadmium dust and salts, as Cd	—	0.05
Calcium arsenate, see WAC 296-62-07347		
Calcium carbonate	—	10
Calcium cyanamide	—	0.5
Calcium hydroxide	—	5
Calcium oxide	—	2
Calcium silicate	—	10
Camphor (synthetic)	2	12

TABLE 1
PERMISSIBLE EXPOSURE LIMITS (PEL)

Substance	ppm (see note a)	mg/M ³ (see note b)
Caprolactam		
dust	—	1
vapor	5	20
Captafol-skin	—	0.1
Captan	—	5
Carbaryl (Sevin ^[R])	—	5
Carbofuran	—	0.1
Carbon black	—	3.5
Carbon dioxide	5,000	9,000
Carbon monoxide	50	55
Carbon tetrabromide	0.1	1.4
Carbonyl chloride, see phosgene		
Carbonyl fluoride	2	5
Catechol	5	20
Cellulose (paper fiber)	—	10
Cesium hydroxide	—	2
Chlordane-skin	—	0.5
Chlorinated camphene-skin	—	0.5
Chlorinated diphenyl oxide	—	0.5
C Chlorine	1	3
Chlorine dioxide	0.1	0.3
C Chlorine tri-fluoride	0.1	0.4
C Chloroacetaldehyde	1	3
α-Chloroacetophenone (Phenacyl/chloride)	0.05	0.3
Chloroacetyl chloride	0.05	0.2
Chlorobenzene		
(Monochlorobenzene)	75	350
C o-Chlorobenzylidene malononitrile (OCBM)-skin	0.05	0.4
Chlorobromomethane	200	1,050
2-Chloro-1,3-butadiene, see Chloroprene		
Chlorodifluoromethane	1,000	3,500
Chlorodiphenyl (42% Chlorine)- skin	—	1
Chlorodiphenyl (54% Chlorine)- skin	—	0.5
1-Chloro-2,3-epoxy propane, see Epichlorhydrin		
2-Chloroethanol, see Ethylene chlorohydrin		
Chloroethylene, see vinylchloride		
Chloroform (Trichloromethane)	10	50
1-Chloro-1-nitropropane	2	10
bis-Chloromethyl ether, see WAC 296-62-073		
Chloropentafluoroethane	1,000	6,320
Chloropicrin	0.1	0.7
Chloroprene (2-chloro-1,3-bu- tadiene)-skin	10	35
o-Chlorostyrene	50	285
o-Chlorotoluene	50	250
2-Chloro-6-(trichloromethyl) pyridine, see Nitrapyrin		
Chlorpyrifos-skin	—	0.2
Chromium Metal	—	0.5
Chromium (II) compounds, as Cr	—	0.5
Chromium (III) compounds, as Cr	—	0.5
Chromium (VI) compounds, as Cr	—	0.05
Chromyl chloride	0.025	0.15
Clopidol	—	10
Coal tar pitch volatiles (benzene soluble fraction anthracene, BaP, phenanthrene, acridine, chrysene, pyrene)	—	0.2
Cobalt, metal fume & dust, as Co	—	0.1
Cobalt carbonyl, as Co	—	0.1
Cobalt hydrocarbonyl, as Co	—	0.1
Copper, as Cu		
Fume	—	0.1
Dusts and Mists	—	1.0
Corundum, see Aluminum oxide		
Cotton Dust (raw)	—	1.0
		(see note e)
Crag ^[R] herbicide	—	10
Cresol (all isomers)-skin	5	22
Crotonaldehyde	2	6
Cruformate	—	5

TABLE 1
PERMISSIBLE EXPOSURE LIMITS (PEL)

Substance	ppm (see note a)	mg/M ³ (see note b)
Cumene-skin	50	245
Cyanamide	—	2
Cyanide (as CN)-skin	—	5
Cyanogen	10	20
C Cyanogen chloride	0.3	0.6
Cyclohexane	300	1,050
Cyclohexanol	50	200
Cyclohexanone-skin	25	100
Cyclohexene	300	1,015
Cyclohexylamine-skin	10	40
Cyclonite-skin, see RDX		
Cyclopentadiene	75	200
Cyclopentane	600	1,720
Cyhexatin	—	5
2,4-D	—	10
DDT	—	1
DDVP, see Dichlorvos		
Decaborane-skin	0.05	0.3
Demeton ^[R] -skin	0.01	0.1
Diacetone alcohol (4-hydroxy-4- methyl-2-pentanone)	50	240
1,2-Diaminoethane, see Ethylendiamine		
Diazinon-skin	—	0.1
Diazomethane	0.2	0.4
Diborane	0.1	0.1
Dibrom ^[R] , see Naled		
1,2-Dibromo-3-chloropropane, see WAC 296-62-07345		
2-N-Dibutylamino ethanol-skin	2	14
Dibutyl phosphate	1	5
Dibutyl phthalate	—	5
C Dichloroacetylene	0.1	0.4
C o-Dichlorobenzene	50	300
p-Dichlorobenzene	75	450
Dichlorodifluoromethane	1,000	4,950
1,3-Dichloro-5,5-dimethyl hydantoin	—	0.2
1,1-Dichloroethane	100	400
1,2-Dichloroethane, see Ethylene dichloride		
1,2-Dichloroethylene	200	790
1,1-Dichloroethylene, see Vinyl- dene chloride		
Dichloromethane, see Methylene chloride		
Dichlorofluoromethane	10	40
1,2-Dichloropropane, see Propylene dichloride		
Dichloropropene-skin	1	5
2,2-Dichloropropionic acid	1	6
Dichlorotetrafluoroethane	1,000	7,000
Dichlorvos (DDVP)-skin	0.1	1
Dicrotophos-skin	—	0.25
Dicyclopentadiene	5	30
Dicyclopentadienyl iron	—	10
Dieldrin-skin	—	0.25
Diethanolamine	3	15
Diethylamine	10	30
Diethylaminoethanol-skin	10	50
C Diethylene triamine-skin	1	4
Diethylether, see Ethyl ether		
Diethyl ketone	200	705
Diethyl phthalate	—	5
Difluorodibromomethane	100	860
Diglycidyl ether (DGE)	0.1	0.5
Dihydroxybenzene, see Hydroquinone		
Diisobutyl ketone	25	250
Diisopropylamine-skin	5	20
Dimethoxymethane, see Methylal		
Dimethyl acetamide-skin	10	35
Dimethylamine	10	18
4-Dimethylaminoazobenzene, see WAC 296-62-073		
Dimethylaminobenzene, see Xylidene		
Dimethylaniline (N, N-Dimeth- ylaniline)-skin	5	25
Dimethylbenzene, see Xylene		

TABLE 1
PERMISSIBLE EXPOSURE LIMITS (PEL)

Substance	ppm (see note a)	mg/M ³ (see note b)
Dimethyl-1,2-dibromo-2,2-dichloroethyl phosphate, see Naled		
Dimethylformamide-skin	10	30
2,6-Dimethylheptanone, see Diisobutyl ketone		
1,1-Dimethylhydrazine-skin	0.5	1
Dimethyl phthalate	—	5
Dimethyl sulfate-skin	0.1	0.5
Dinitolmide	—	5
Dinitrobenzene (all isomers)-skin	0.15	1
Dinitro-o-cresol-skin	—	0.2
Dinitrotoluene-skin	—	1.5
Dioxane (Diethylene dioxide)-skin	25	90
Dioxathion-skin	—	0.2
Diphenyl	0.2	1.5
Diphenylamine	—	10
Diphenylmethane diisocyanate (see Methylene bisphenyl isocyanate (MDI))		
Dipropylene glycol methyl ether-skin	100	600
Dipropyl ketone	50	235
Diquat	—	0.5
Di-sec-octyl phthalate (Di-2-ethylhexylphthalate)	—	5
Disulfram	—	2
Disulfoton	—	0.1
2,6-Ditert.butyl-p-cresol	—	10
Diuron	—	10
Divinyl benzene	10	50
Emery	—	10
Endosulfan (Thiodan ^[R])-skin	—	0.1
Endrin-skin	—	0.1
Epichlorhydrin-skin	2	10
EPN-skin	—	0.5
1,2-Epoxypropane, see Propylene-oxide		
2,3-Epoxy-1-propanol, see Glycidol		
Ethane	Simple	Asphyxiant
Ethanethiol, see Ethyl/mercaptan		
Ethanolamine	3	8
Ethion-skin	—	0.4
2-Ethoxyethanol-skin	5	19
2-Ethoxyethyl/acetate (Cellosolve acetate)-skin	5	27
Ethyl acetate	400	1,400
Ethyl acrylate-skin	5	20
Ethyl alcohol (ethanol)	1,000	1,900
Ethylamine	10	18
Ethyl amyl ketone	25	130
Ethyl benzene	100	435
Ethyl bromide	200	890
Ethyl butyl ketone (3-Heptanone)	50	230
Ethyl chloride	1,000	2,600
Ethylene	Simple	Asphyxiant
C Ethylene chlorohydrin-skin	1	3
Ethylenediamine	10	25
C Ethylene glycol	50	125
Ethylene glycol dinitrate and/or Nitroglycerin-skin	0.05 (see note d)	0.3
Ethylene glycol monomethyl ether acetate (Methyl cellosolve acetate)-skin	5	24
Ethylene imine-skin, see WAC 296-62-073		
Ethylene oxide (see WAC 296-62-07353)	1	2
Ethyl ether	400	1,200
Ethyl formate	100	300
Ethylidene chloride, see 1,1-Dichloroethane		
C Ethylidene norbornene	5	25
Ethyl mercaptan	0.5	1
n-Ethylmorpholine-skin	5	23
Ethyl sec-amyl ketone (5-methyl-3-heptanone)	25	130

TABLE 1
PERMISSIBLE EXPOSURE LIMITS (PEL)

Substance	ppm (see note a)	mg/M ³ (see note b)
Ethyl silicate	10	85
Fenamiphos-skin	—	0.1
Fensulfothion	—	0.1
Fenthion-skin	—	0.2
Ferbam	—	10
Ferrovandium dust	—	1
Fluorides, as F	—	2.5
Fluorine	0.1	0.2
Fluorotrichloromethane, see Trichlorofluoro methane		
Fonofos-skin	—	0.1
Formamide	20	30
Formic acid	5	9
Furfural-skin	2	8
Furfuryl alcohol-skin	10	40
Gasoline	300	900
Germanium tetrahydride	0.2	0.6
Glass, fibrous or dust (see note e)	—	10
C Gluteraldehyde	0.2	0.7
Glycerin mist	—	10
Glycidol (2,3-Epoxy-1-propanol)	25	75
Glycol monoethyl ether, see 2-Ethoxyethanol		
Graphite (Synthetic)	—	10
Guthion ^[R] , see Azinphosmethyl		
Gypsum	—	10
Hafnium	—	0.5
Helium	Simple	Asphyxiant
Heptachlor-skin	—	0.5
Heptane (n-heptane)	400	1,600
2-Heptanone, see Methyl n-amyl ketone		
3-Heptanone, see Ethyl butyl ketone		
Hexachlorobutadiene-skin	0.02	0.24
Hexachlorocyclopentadiene	0.01	0.1
Hexachloroethane	10	100
Hexachloronaphthalene-skin	—	0.2
Hexafluoroacetone-skin	0.1	0.7
Hexane		
n-hexane	50	180
other Isomers	500	1,800
2-Hexanone	5	20
Hexone (Methyl isobutyl ketone)	50	205
sec-Hexyl acetate	50	300
C Hexylene Glycol	25	125
Hydrazine-skin	0.1	0.1
Hydrogen	Simple	Asphyxiant
Hydrogenated terphenyls	0.5	5
C Hydrogen bromide	3	10
C Hydrogen chloride	5	7
C Hydrogen cyanide-skin	10	10
C Hydrogen fluoride	3	2.5
Hydrogen peroxide	1	1.5
Hydrogen selenide	0.05	0.2
Hydroquinone	—	2
4-Hydroxy-4-methyl-2-pentanone, see Diacetone alcohol		
2-Hydroxypropyl acrylate-skin	0.5	3
Indene	10	45
Indium and compounds, as In	—	0.1
C Iodine	0.1	1
Iodoform	0.6	10
Iron oxide fume	—	5
Iron pentacarbonyl	0.01	0.08
Iron salts, soluble, as Fe	—	1
Isoamyl acetate	100	525
Isoamyl alcohol	100	360
Isobutyl acetate	150	700
Isobutyl alcohol	50	150
Isooctyl alcohol	50	270
C Isophorone	5	25
Isophorone diisocyanate-skin	0.01	0.09
Isopropoxyethanol	25	105
Isopropyl acetate	250	950
Isopropyl alcohol	400	980
Isopropylamine	5	12
N-Isopropylaniline-skin	2	10
Isopropyl/ether	250	1,050
Isopropyl glycidyl ether (IGE)	50	240

TABLE 1
PERMISSIBLE EXPOSURE LIMITS (PEL)

Substance	ppm (see note a)	mg/M ³ (see note b)
Kaolin	—	10
Ketene	0.5	0.9
Lead and its inorganic compounds which are exempt from WAC 296-62-07521	—	0.15
Lead arsenate—see WAC 296- 62-07347	—	0.15
Lead chromate	—	0.05
Limestone	—	10
Lindane	—	0.5
Lithium hydride	—	0.025
L.P.G. (liquified petroleum gas)	1,000	1,800
Magnesite	—	10
Magnesium oxide fume	—	10
Malathion-skin	—	10
Maleic anhydride	0.25	1
C Manganese and compounds, as Mn	—	5
Manganese tetroxide and fume	—	1
Manganese cyclopentadienyl tricarbonyl, as Mn-skin	—	0.1
Marble	—	10
Mesityl oxide	15	60
Methacrylic acid	20	70
Methane	Simple	Asphyxiant
Methanethiol, see Methyl mercaptan	—	—
Methomyl-skin	—	2.5
Methoxychlor	—	10
2-Methoxyethanol-skin (Methyl cellosolve)	5	16
4-Methoxyphenol	—	5
Methyl acetate	200	610
Methyl acetylene (propyne)	1,000	1,650
Methyl acetylene-propadiene mixture (MAPP)	1,000	1,800
Methyl acrylate-skin	10	35
Methylacrylonitrile-skin	1	3
Methylal (dimethoxy-methane)	1,000	3,100
Methyl alcohol (methanol)	200	260
Methylamine	10	12
Methyl amyl alcohol, see Methyl isobutyl carbinol	—	—
Methyl n-amyl ketone (2- Heptanone)	50	235
N-Methyl aniline, see Monomethyl aniline	—	—
Methyl bromide-skin	5	20
Methyl butyl ketone, see 2- Hexanone	—	—
Methyl cellosolve-skin, see 2- Methoxyethanol	—	—
Methyl cellosolve acetate-skin, see Ethylene glycol monomethyl ether acetate	—	—
Methyl chloride	50	105
Methyl chloroform	350	1,900
Methyl chloromethyl ether, see WAC 296-62-073	—	—
Methyl 2-cyano acrylate	2	8
Methylcyclohexane	400	1,600
Methylcyclohexanol	50	235
Methylcyclohexanone-skin	50	230
Methylcyclopentadienyl manga- nese tricarbonyl (as Mn)-skin	—	0.2
Methyl demeton-skin	—	0.5
C Methylene bisphenyl isocyanate (MDI)	0.02	0.2
4,4'-Methylene bis (2- chloroaniline), see WAC 296- 62-073	—	—
C Methylene bis (4- cyclohexylisocyanate)	0.01	0.11
4,4-Methylene dianiline-skin	0.1	0.8
Methyl ethyl ketone (MEK), see 2-Butanone	—	—
C Methyl ethyl ketone peroxide	0.2	1.5
Methyl formate	100	250
5-Methyl-3-heptanone, see Ethyl amyl ketone	—	—

TABLE 1
PERMISSIBLE EXPOSURE LIMITS (PEL)

Substance	ppm (see note a)	mg/M ³ (see note b)
Methyl hydrazine, see Monomethyl hydrazine	—	—
Methyl iodide-skin	2	10
Methyl isoamyl ketone	50	240
Methyl isobutyl carbinol-skin	25	100
Methyl isobutyl ketone, see Hexone	—	—
Methyl isocyanate-skin	0.02	0.05
Methyl isopropyl ketone	200	705
Methyl mercaptan	0.5	1
Methyl methacrylate	100	410
Methyl parathion-skin	—	0.2
Methyl propyl ketone, see 2- Pentanone	—	—
Methyl silicate	1	6
Mevinphos ^[R] , see Phosdrin	—	—
Metribuzin	—	5
Molybdenum, as Mo	—	—
Soluble compounds	—	5
Insoluble compounds	—	10
Monomethyl aniline-skin	0.5	2
Monocrotophos	—	0.25
C Monomethyl hydrazine-skin	0.2	0.35
Morpholine-skin	20	70
Naled-skin	—	3
Naphtha (coal tar)	100	400
Naphthalene	10	50
α -Naphthylamine, see WAC 296-62-073	—	—
B-Naphthylamine, see WAC 296-62-073	—	—
Neon	Simple	Asphyxiant
Nickel carbonyl	0.001	0.007
Nickel, as Ni	—	—
Metal	—	1
Soluble compounds	—	0.1
Nicotine-skin	—	0.5
Nitrapyrin	—	10
Nitric acid	2	5
Nitric oxide	25	30
p-Nitroaniline-skin	—	3
Nitrobenzene-skin	1	5
4-Nitrophenyl, see WAC 296- 62-073	—	—
p-Nitrochlorobenzene-skin	—	0.5
Nitroethane	100	310
Nitrogen	Simple	Asphyxiant
Nitrogen trifluoride	10	30
Nitroglycerin-skin	0.05	0.5
Nitromethane	100	250
1-Nitropropane	25	90
2-Nitropropane	10	35
N-Nitrosodimethylamine, see WAC 296-62-073	—	—
Nitrotoluene-skin	2	11
Nitrotrichloromethane, see Chloropicrin	—	—
Nitrous Oxide	30	54
Nonane	200	1,050
Octachloronaphthalene-skin	—	0.1
Octane	300	1,450
Oil mist, particulate	—	5
Osmium tetroxide	0.0002	0.002
Oxalic acid	—	1
C Oxygen difluoride	0.05	0.1
Ozone	0.1	0.2
Paraffin wax fume	—	2
Paraquat-skin	—	0.1
Parathion-skin	—	0.1
Particulate polycyclic aromatic hydrocarbons (PPAH), see coal tar pitch volatiles	—	—
Pentaborane	0.005	0.01
Pentachloronaphthalene-skin	—	0.5
Pentachlorophenol-skin	—	0.5
Pentaerythritol	—	10
Pentane	600	1,800
2-Pentanone	200	700
Perchloromethyl mercaptan	0.1	0.8
Perchloryl fluoride	3	14

TABLE 1
PERMISSIBLE EXPOSURE LIMITS (PEL)

Substance	ppm (see note a)	mg/M ³ (see note b)
Phenol-skin	5	19
Phenothiazine-skin	—	5
p-Phenylene diamine-skin	—	0.1
Phenyl ether (vapor)	1	7
Phenyl ether-Diphenyl mixture (vapor)	1	7
Phenylethylene, see Styrene		
Phenyl glycidyl ether (PGE)	1	6
Phenylhydrazine-skin	5	20
Phenyl mercaptan	0.5	2
C Phenylphosphine	0.05	0.25
Phorate-skin	—	0.05
Phosdrin (Mevinphos ^[R])-skin	0.01	0.1
Phosgene (carbonyl chloride)	0.1	0.4
Phosphine	0.3	0.4
Phosphoric acid	—	1
Phosphorus (yellow)	—	0.1
Phosphorous oxychloride	0.1	0.6
Phosphorus pentachloride	0.1	1
Phosphorus pentasulfide	—	1
Phosphorus trichloride	0.2	1.5
Phthalic anhydride	1	6
m-Phthalodinitrile	—	5
Picloram	—	10
Picric acid-skin	—	0.1
Pindone, see Pival		
Piperazine dihydrochloride	—	5
Pival ^[R] (2-Pivalyl-1,3-indandione)	—	0.1
Plaster of Paris	—	10
Platinum, as Pt		
Metal	—	1
Soluble salts	—	0.002
Polychlorobiphenyls, see Chlorodiphenyls		
C Potassium hydroxide	—	2
Propane	Simple	Asphyxiant
Propargyl alcohol-skin	1	2
B-Propiolactone, see WAC 296-62-073		
Propionic acid	10	30
Propoxur	—	0.5
n-Propyl acetate	200	840
Propyl alcohol-skin	200	500
Propylene	Simple	Asphyxiant
Propylene dichloride (1,2-Dichloropropane)	75	350
Propylene glycol dinitrate-skin	0.05	0.3
Propylene glycol monomethyl ether	100	360
Propylene imine-skin	2	5
Propylene oxide	20	50
n-Propyl nitrate	25	105
Propyne, see Methyl/acetylene		
Pyrethrum	—	5
Pyridine	5	15
Quinone	0.1	0.4
RDX-skin	—	1.5
Resorcinol	10	45
Rhodium, as Rh		
Metal fumes and dusts	—	0.1
Soluble salts	—	0.001
Ronnel	—	10
Rosin Core Solder, pyrolysis products (as formaldehyde)	—	0.1
Rotenone (commercial)	—	5
Rouge	—	10
Rubber solvent (naphtha)	400	1,600
Selenium compounds (as Se)	—	0.2
Selenium hexafluoride	0.05	0.2
Sesone, see Crag herbicide		
Silane, see Silicon tetrahydride		
Silicon	—	10
Silicon Carbide	—	10
Silicon tetrahydride	5	7
Silver, metal and soluble compounds	—	0.01
C Sodium azide	0.1	0.3
Sodium bisulfite	—	5

TABLE 1
PERMISSIBLE EXPOSURE LIMITS (PEL)

Substance	ppm (see note a)	mg/M ³ (see note b)
Sodium-2, 4-dichloro-phenoxyethyl sulfate, see Crag herbicide		
Sodium fluoroacetate (1080)-skin	—	0.05
C Sodium hydroxide	—	2
Sodium metabisulfite	—	5
Starch	—	10
Stibine	0.1	0.5
Stoddard solvent	100	525
Strychnine	—	0.15
C Subtilisins (proteolytic enzymes)	—	0.00006
Sucrose	—	10
Sulfotep-skin, see TEDP		
Sulfur dioxide	2	5
Sulfur hexafluoride	1,000	6,000
Sulfuric acid	—	1
C Sulfur monochloride	1	6
C Sulfur pentafluoride	0.01	0.1
C Sulfur tetrafluoride	0.1	0.4
Sulfuryl fluoride	5	20
Sulprofos	—	1
Systox, see Demeton ^[R]	—	—
2,4,5-T	—	10
Tantalum	—	5
TEDP-skin	—	0.2
Tellurium	—	0.1
Tellurium hexafluoride	0.02	0.2
Temephos	—	10
TEPP-skin	0.004	0.05
C Terphenyls	0.5	5
1,1,1,2-Tetrachloro-2,2-difluoroethane	500	4,170
1,1,2,2-Tetrachloro-1,2-difluoroethane	500	4,170
1,1,2,2-Tetrachloroethane-skin	1	7
Tetrachloromethane, see Carbon tetrachloride		
Tetrachloronaphthalene-skin	—	2
Tetraethyl lead (as Pb)-skin	—	0.1 (see note f)
Tetrahydrofuran	200	590
Tetramethyl lead (as Pb)-skin	—	0.15 (see note f)
Tetramethyl succinonitrile-skin	0.5	3
Tetranitromethane	1	8
Tetrasodium pyrophosphate	—	5
Tetryl (2,4,6-trinitrophenyl-methylnitramine)-skin	—	1.5
Thallium (soluble compounds)-skin (as Tl)	—	0.1
4,4-Thiobis (6-tert.butyl-m-cresol)	—	10
Thioglycolic acid-skin	1	4
C Thionyl chloride	1	5
Thiram ^[R] , see WAC 296-62-07519	—	5
Tin, as Sn		
Metal	—	2
Oxide and inorganic compounds, except SnH ₄	—	2
Organic compounds-skin	—	0.1
Titanium dioxide	—	10
C Toluene-2,4-diisocyanate (TDI)	0.005	0.04
o-Toluidine-skin	2	9
p-Toluidine-skin	2	9
Toxaphene, see Chlorinated camphene		
Tributyl phosphate	0.2	2.5
Trichloroacetic acid	1	7
C 1,2,4-Trichlorobenzene	5	40
1,1,1-Trichloroethane, see Methyl chloroform		
1,1,2-Trichloroethane-skin	10	45
C Trichlorofluoromethane	1,000	5,600
Trichloromethane, see Chloroform		
Trichloronaphthalene-skin	—	5
1,2,3-Trichloropropane-skin	10	60
1,1,2-Trichloro-1,2,2-trifluoroethane	1,000	7,600

TABLE 1
PERMISSIBLE EXPOSURE LIMITS (PEL)

Substance	ppm (see note a)	mg/M ³ (see note b)
Tricyclohexyltin hydroxide, see Cyhexatin		
Triethylamine	10	40
Trifluorobromomethane	1,000	6,100
Trimellitic anhydride	0.005	0.04
Trimethylamine	10	24
Trimethyl benzene	25	125
Trimethyl phosphite	2	10
2,4,6-Trinitrophenol, see Picric acid		
2,4,6-Trinitrophenyl-methylnitramine, see Tetryl		
Trinitrotoluene-skin	—	0.5
Triorthocresyl phosphate-skin	—	0.1
Triphenyl/amine	—	5
Triphenyl phosphate	—	3
Tungsten & Compounds, as W		
Soluble	—	1
Insoluble	—	5
Turpentine	100	560
Uranium (natural) sol. & insol. compounds as U	—	0.2
Valeraldehyde	50	175
Vanadium (V ₂ O ₅), as V	—	0.05
Vegetable oil mist	—	10
Vinyl acetate	10	30
Vinyl bromide	5	20
Vinyl chloride, see WAC 296-62-07329		
Vinyl cyanide, see Acrylonitrile		
Vinyl cyclohexene dioxide	10	60
Vinyl toluene	50	240
Vinylidene chloride	5	20
VM&P naphtha	300	1,350
Warfarin	—	0.1
Welding fume	—	5
Wood dust		
Nonallergenic	—	5
Allergenic (e.g. cedar, mahogany, teak)	—	2.5
C m-Xylene- α,α -diamine-skin	—	0.1
Xylene (xylol)	100	435
Xylidine-skin	2	10
Yttrium	—	1
Zinc chloride fume	—	1
Zinc chromate	—	0.05
Zinc oxide dust	—	10
Zinc oxide fume	—	5
Zinc stearate	—	10
Zirconium compounds (as Zr)	—	5

- Note: a) Parts of vapor or gas per million parts of contaminated air by volume at 25°C and 760 mm. Hg. pressure.
 b) Approximate milligrams of substance per cubic meter of air.
 c) No footnote "c" is used to avoid confusion with ceiling value notations.
 d) An atmospheric concentration of more than 0.02 ppm may require personal protection to avoid headache.
 e) This 8-hour time-weighted average is for respirable dust as measured by a vertical elutriator cotton dust sampler or equivalent instrument. This time-weighted average applies to the cotton waste processing operations of waste recycling (sorting, blending, cleaning, and willowing) and garnetting.
 f) Biologic monitoring is essential for personnel control.

TABLE 2
PERMISSIBLE EXPOSURE AND SHORT TERM LIMITS
(see note a)

Substance	8-hour time-weighted average permissible exposure limit	Short term permissible exposure limit
Allyl glycidal ether-skin	5 ppm	10 ppm
Benzene (see note b)	1 ppm	5 ppm
Beryllium and beryllium compounds	2 $\mu\text{g}/\text{M}^3$	5 $\mu\text{g}/\text{M}^3$

TABLE 2
PERMISSIBLE EXPOSURE AND SHORT TERM LIMITS
(see note a)

Substance	8-hour time-weighted average permissible exposure limit	Short term permissible exposure limit
Carbon disulfide-skin	10 ppm	15 ppm
Carbon tetrachloride-skin	5 ppm	20 ppm
Dichloroethyl ether-skin	5 ppm	10 ppm
1,1-Dichloro-1-nitroethane	2 ppm	10 ppm
Ethylene dibromide-skin	0.1 ppm	0.5 ppm
Ethylene dichloride	10 ppm	15 ppm
Formaldehyde (see note c)	1 ppm	2 ppm
Hydrogen sulfide	10 ppm	15 ppm
Mercury		
Organo-skin	0.01 mg/M ³	0.03 mg/M ³
All other compounds except organo	0.05 mg/M ³	0.1 mg/M ³
Methylene chloride	100 ppm	500 ppm
α Methyl styrene	50 ppm	100 ppm
Nitrogen dioxide	3 ppm	5 ppm
Styrene, monomer (vinyl benzene)	100 ppm	200 ppm
Tetrachloroethylene (perchloroethylene)	50 ppm	200 ppm
Toluene	100 ppm	150 ppm
Trichloroethylene	50 ppm	200 ppm

Note: a) A short term permissible exposure limit is defined as a 15-minute time-weighted average exposure which shall not be exceeded at any time during a work day even if the 8-hour time-weighted average is within the permissible exposure limit. Exposures at the short term limit shall not be longer than 15 minutes and shall not be repeated more than four times per day. There shall be at least 60 minutes between successive exposures at the short term limit.

b) This standard applies to the industry segments exempt from WAC 296-62-07523 and also applies to any industry for which WAC 296-62-07523 is stayed or otherwise not in effect.

c) This standard applies to any industry for which WAC 296-62-07540 through 296-62-07550 is stayed or otherwise not in effect.

TABLE 3
PARTICULATES

Substance	Respirable Fraction mg/M ³ (See note a)	Total Dust mg/M ³
Silica:		
Crystalline: (See note b)		
Quartz	0.1	30mg/M ³ %SiO ₂ +3
Cristobalite: Use 1/2 the value for quartz.		
Tridymite: Use 1/2 the value for quartz.		
Amorphous, including natural diatomaceous earth		
	3	6
Silicates (less than 1% crystalline silica):		
Mica	3	6
Soapstone	3	6
Talc	2	
Talc containing no asbestos fibers		
Fibrous form-see WAC 296-62-07517		
Portland cement	5	10
Graphite (natural)	2.5	5
Coal dust (respirable fraction)		
Less than 5% SiO ₂	2.4	
For more than 5% SiO ₂	0.1	
Inert or nuisance dust	5	10
Total particulates (less than 1% SiO ₂)	5	10

Note: (a) Both concentration and percent quartz for the application of these limits are to be determined from the fraction passing a size-selector with the following characteristics:
 (b) The percentage of crystalline silica in the formula is the amount determined from airborne samples, except in those instances in which other methods have been shown to be applicable.

Aerodynamic diameter (unit density sphere)	Percent passing selector
2	90
2.5	75
3.5	50
5.0	25
10	0

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-62-07515, filed 7/6/88; 87-24-051 (Order 87-24), § 296-62-07515, filed 11/30/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-16-009 (Order 86-28), § 296-62-07515, filed 7/25/86; 85-01-022 (Order 84-24), § 296-62-07515, filed 12/11/84; 82-13-045 (Order 82-22), § 296-62-07515, filed 6/11/82. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-16-015 (Order 81-20), § 296-62-07515, filed 7/27/81; 80-11-010 (Order 80-14), § 296-62-07515, filed 8/8/80. Statutory Authority: RCW 49.17.040, 49.17.150 and 49.17.240. 79-08-115 (Order 79-9), § 296-62-07515, filed 7/31/79; Order 73-3, § 296-62-07515, filed 5/7/73.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency and appear herein pursuant to the requirements of RCW 34.08.040.

PART I--AIR CONTAMINANTS (SPECIFIC)

WAC 296-62-07517 Asbestos.

This standard applies whenever all or part of the revised standards are rendered unenforceable because of a stay or judicial action. In such a case, to preclude a gap in coverage, parallel provisions of this standard will take effect. The department will publish an appropriate notice announcing each such application of this standard. This standard also applies pursuant to the requirements of WAC 296-62-07701.

(1) Definitions. For the purpose of this section,

(a) "Asbestos" means chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos and any of these materials that have been chemically treated and/or altered.

(b) "Asbestos fibers" means asbestos fibers five micrometers or longer.

(2) Permissible exposure to airborne concentrations of asbestos fibers.

(a) The eight-hour time-weighted average airborne concentrations of asbestos fibers to which any employee may be exposed shall not exceed two fibers, longer than five micrometers, per cubic centimeter of air, as determined by the method prescribed in subsection (5) of this section.

(b) Ceiling concentration. No employee shall be exposed at any time to airborne concentrations of asbestos fibers in excess of ten fibers, longer than five micrometers, per cubic centimeter of air, as determined by the method prescribed in subsection (5) of this section.

(3) Methods of compliance.

(a) Engineering methods.

(i) Engineering controls. Engineering controls, such as, but not limited to, isolation, enclosure, exhaust ventilation, and dust collection, shall be used to meet the exposure limits prescribed in subsection (2) of this section.

(ii) Local exhaust ventilation. Local exhaust ventilation and dust collection systems shall be designed, constructed, installed, and maintained in accordance with the American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Z9.2-1971, which is incorporated by reference herein.

(iii) Particular tools. All hand-operated and power-operated tools which may produce or release asbestos fibers in excess of the exposure limits prescribed in subsection (2) of this section, such as, but not limited to, saws, scorers, abrasive wheels, and drills, shall be provided with local exhaust ventilation systems in accordance with (a)(ii) of this subsection.

(b) Work practices.

(i) Wet methods. Insofar as practicable, asbestos shall be handled, mixed, applied, removed, cut, scored, or otherwise worked in a wet state sufficient to prevent the emission of airborne fibers in excess of the exposure limits prescribed in subsection (2) of this section, unless the usefulness of the product would be diminished thereby.

(ii) Particular products and operations. No asbestos cement, mortar, coating, grout, plaster, or similar material containing asbestos shall be removed from bags, cartons, or other containers in which they are shipped, without being either wetted, or enclosed, or ventilated so as to prevent effectively the release of airborne asbestos fibers in excess of the limits prescribed in subsection (2) of this section.

(iii) Spraying, demolition, or removal. Employees engaged in the spraying of asbestos, the removal, or demolition of pipes, structures, or equipment covered or insulated with asbestos, and in the removal or demolition of asbestos insulation or coverings shall be provided with respiratory equipment in accordance with subsection (4)(b)(iii) of this section and with special clothing in accordance with subsection (4)(c) of this section.

(4) Personal protective equipment.

(a) Compliance with the exposure limits prescribed by subsection (2) of this section may not be achieved by the use of respirators or shift rotation of employees except:

(i) During the time period necessary to install the engineering controls and to institute the work practices required by subsection (3) of this section.

(ii) In work situations in which the methods prescribed in subsection (3) of this section are either technically not feasible or feasible to an extent insufficient to reduce the airborne concentrations of asbestos fibers below the limits prescribed by subsection (2) of this section; or

(iii) In emergencies.

(iv) Where both respirators and personnel rotation are allowed by (a)(i), (ii), or (iii) of this subsection, and both are practicable, personnel rotation shall be preferred and used.

(b) Where a respirator is permitted by (a)(i), (ii), or (iii) of this subsection, it shall comply with the applicable provisions of WAC 296-62-071.

(i) Air purifying respirators. A reusable or single use air purifying respirator, or a respirator described in (b)(ii) or (iii) of this subsection shall be used to reduce the concentrations of airborne asbestos fibers in the respirator below the exposure limits prescribed in subsection (2)(a) of this section, when the eight-hour time-weighted average airborne concentrations of asbestos fibers are reasonably expected to exceed no more than ten times those limits.

(ii) Powered air purifying respirators. A full facepiece powered air purifying respirator, or a powered air purifying respirator, or a respirator described in (b)(iii) of this subsection, shall be used to reduce the concentrations of airborne asbestos fibers in the respirator below the exposure limits prescribed in subsection (2)(a) of this section, when the eight-hour time-weighted average concentrations of asbestos fibers are reasonably expected to exceed ten times, but not one hundred times, those limits.

(iii) Type "C" supplied-air respirators, continuous flow or pressure-demand class. A type "C" continuous flow or pressure-demand, supplied-air respirator shall be used to reduce the concentrations of airborne asbestos fibers in the respirator below the exposure limits prescribed in subsection (2)(a) of this section, when the eight-hour time-weighted average airborne concentrations of asbestos fibers are reasonably expected to exceed one hundred times those limits.

(iv) Establishment of a respirator program.

(A) The employer shall establish a respirator program in accordance with the requirements of chapter 296-62 WAC and shall include the respirator protection factors listed in Table 1 of this section.

(B) No employee shall be assigned to tasks requiring the use of respirators if, based upon his most recent examination, an examining physician determines that the employee will be unable to function normally wearing a respirator, or that the safety or health of the employee or other employees will be impaired by his use of a respirator. Such employee shall be rotated to another job or given the opportunity to transfer to a different position whose duties he is able to perform with the same employer, in the same geographical area and with the same seniority, status, and rate of pay he had just prior to such transfer, if such a different position is available.

(c) Special clothing: The employer shall provide, and require the use of, special clothing, such as coveralls or similar whole body clothing, head coverings, gloves, and foot coverings for any employee exposed to airborne concentrations of asbestos fibers, which exceed eight-hour time-weighted average airborne concentrations of asbestos fibers prescribed in subsection (2)(a) of this section.

(d) Change rooms:

(i) At any fixed place of employment exposed to airborne concentrations of asbestos fibers in excess of the

exposure limits prescribed in subsection (2) of this section, the employer shall provide change rooms for employees working regularly at the place.

(ii) Clothes lockers: The employer shall provide two separate lockers or containers for each employee, so separated or isolated as to prevent contamination of the employee's street clothes from his work clothes.

(iii) Laundering:

(A) Laundering of asbestos contaminated clothing shall be done so as to prevent the release of airborne asbestos fibers in excess of the exposure limits prescribed in subsection (2) of this section.

(B) Any employer who gives asbestos-contaminated clothing to another person for laundering shall inform such person of the requirement in (d) of this subsection to effectively prevent the release of airborne asbestos fibers in excess of the exposure limits prescribed in subsection (2) of this section.

(C) Contaminated clothing shall be transported in sealed impermeable bags, or other closed, impermeable containers, and labeled in accordance with subsection (7)(b) of this section.

(5) Method of measurement. All determinations of airborne concentrations of asbestos fibers shall be made by the membrane filter method at 400-450 X (magnification) four millimeter objective) with phase contrast illumination.

(6) Monitoring.

(a) Initial determinations. Every employer shall cause every place of employment where asbestos fibers are released to be monitored in such a way as to determine whether every employee's exposure to asbestos fibers is below the limits prescribed in subsection (2) of this section. If the limits are exceeded, the employer shall immediately undertake a compliance program in accordance with subsection (3) of this section.

(b) Personal monitoring.

(i) Samples shall be collected from within the breathing zone of the employees, on membrane filters of 0.8 micrometer porosity mounted in an open-face filter holder. Samples shall be taken for the determination of the eight-hour time-weighted average airborne concentrations and of the ceiling concentrations of asbestos fibers.

(ii) Sampling frequency and patterns. After the initial determinations required by (a) of this subsection, samples shall be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of employees. In no case shall the sampling be done at intervals greater than six months for employees whose exposure to asbestos may reasonably be foreseen to exceed the limits prescribed by subsection (2) of this section.

(c) Environmental monitoring.

(i) Samples shall be collected from areas of a work environment which are representative of the airborne concentrations of asbestos fibers which may reach the breathing zone of employees. Samples shall be collected on a membrane filter of 0.8 micrometer porosity mounted in an open-face filter holder. Samples shall be taken for the determination of the eight-hour time-

weighted average airborne concentrations and of the ceiling concentrations of asbestos fibers.

(ii) Sampling frequency and patterns. After the initial determinations required by (a) of this subsection, samples shall be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of the employees. In no case shall sampling be at intervals greater than six months for employees whose exposures to asbestos may reasonably be foreseen to exceed the exposure limits prescribed in subsection (2) of this section.

(d) Employee observation of monitoring. Affected employees, or their representatives, shall be given a reasonable opportunity to observe any monitoring required by this subsection and shall have access to the records thereof.

(7) Caution signs and labels.

(a) Caution signs.

(i) Posting. Caution signs shall be provided and displayed at each location where airborne concentrations of asbestos fibers are reasonably expected to be released or where airborne concentrations of asbestos fibers may be in excess of the exposure limits prescribed in subsection (2) of this section. Signs shall be posted at such a distance from such a location so that an employee may read the signs and take necessary protective steps before entering the area marked by the signs. Signs shall be posted at all approaches to areas containing airborne asbestos fibers.

(ii) Sign specifications. The warning signs required by (a)(i) of this subsection shall conform to the requirements of 20" X 14" vertical format signs specified in WAC 296-24-14007(4) and to this subsection. The signs shall display the following legend in the lower panel, with letter sizes and styles of a visibility at least equal to that specified in this subdivision.

Legend	Notation
Asbestos _____	1" Sans Serif, Gothic or Block.
Dust hazard _____	3/4" Sans Serif, Gothic or Block.
Avoid breathing dust _____	1/4" Gothic.
Wear assigned protective equipment _____	1/4" Gothic.
Do not remain in area unless your work requires it _____	1/4" Gothic.
Breathing asbestos dust may be hazardous to your health _____	14 point Gothic.

Spacing between lines shall be at least equal to the height of the upper of any two lines.

(b) Caution labels.

(i) Labeling. Caution labels shall be affixed to all raw materials, mixtures, scrap, waste, debris, and other products containing asbestos fibers, or to their containers, except that no label is required where asbestos fibers have been modified by a bonding agent, coating, binder, or other material so that during any reasonably foreseeable use, handling, storage, disposal, processing, or transportation, no airborne concentrations of asbestos fibers will be released.

(ii) Label specifications. The caution labels required by (b)(i) of this subsection shall be printed in letters of

sufficient size and contrast as to be readily visible and legible. The label shall state:

CAUTION

Contains Asbestos Fibers

Avoid Creating Dust

Breathing Asbestos Dust May Cause

Serious Bodily Harm

(8) Housekeeping.

(a) Cleaning. All external surfaces in any place of employment shall be maintained free of accumulations of asbestos fibers.

(b) Waste disposal. Asbestos waste, scrap, debris, bags, containers, equipment, and asbestos-contaminated clothing, consigned for disposal, shall be collected and disposed of in sealed impermeable bags, or other closed, impermeable containers.

(c) Deterioration. Friable asbestos or friable asbestos containing material which has become damaged or deteriorated shall be contained, treated, or replaced.

(9) Recordkeeping.

(a) Exposure records. Every employer shall maintain records of any personal or environmental monitoring required by subsection (6) of this section. Records shall be maintained for a period of at least twenty years and shall be made available upon request to the director of the department of labor and industries.

(b) Access. Employee exposure records required by this subsection shall be provided upon request to employees, designated representatives, and the assistant director in accordance with WAC 296-62-05201 through 296-62-05209 and 296-62-05213 through 296-62-05217.

(c) Employee notification. Any employee found to have been exposed at any time to airborne concentrations of asbestos fibers in excess of the limits prescribed in subsection (2) of this section shall be notified in writing of the exposure as soon as practicable but not later than five days of the finding. The employee shall also be timely notified of the corrective action being taken.

(10) Medical examinations.

(a) General. The employer shall provide or make available at his cost, medical examinations relative to exposure to asbestos required by this section.

(b) Preplacement. The employer shall provide or make available to each of his employees, within thirty calendar days following his first employment in an occupation exposed to airborne concentrations of asbestos fibers, a comprehensive medical examination, which shall include, as a minimum, a chest roentgenogram (posterior-anterior fourteen by seventeen inches), a history to elicit symptomatology of respiratory disease, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at one second (FEV_{1.0}).

(c) Annual examinations. Every employer shall provide or make available on an annual basis, comprehensive medical examinations to each of his employees

engaged in occupations exposed to airborne concentrations of asbestos fibers. Such annual examination shall include, as a minimum, a chest roentgenogram (posterior-anterior fourteen by seventeen inches), a history to elicit symptomatology of respiratory disease, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at one second ($FEV_{1.0}$).

(d) Termination of employment. The employer shall provide, or make available, within thirty calendar days before or after the termination of employment of any employee engaged in an occupation exposed to airborne concentrations of asbestos fibers, a comprehensive medical examination which shall include, as a minimum, a chest roentgenogram (posterior-anterior fourteen by seventeen inches), a history to elicit symptomatology of respiratory disease, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at one second ($FEV_{1.0}$).

(e) Recent examinations. No medical examination is required of any employee, if adequate records show that the employee has been examined in accordance with this subsection within the past one-year period.

(f) Medical records.

(i) Maintenance. Employers of employees examined pursuant to this subsection shall cause to be maintained complete and accurate records of all such medical examinations. Records shall be retained by employers for at least twenty years.

(ii) Access. Records of the medical examinations required by this subsection shall be provided upon request to employees, designated representative and the assistant director in accordance with WAC 296-62-05201 through 296-62-05209 and WAC 296-62-05213 through 296-62-05217. These records shall also be provided upon request to the director of the department of labor and industries. Any physician who conducts a medical examination required by this subsection shall furnish to the employer of the examined employee all the information specifically required by this subsection, and any other medical information related to occupational exposure to asbestos fibers.

TABLE 1
RESPIRATOR PROTECTION FOR AIRBORNE CONCENTRATIONS OF ASBESTOS

Airborne concentration of asbestos	Required respirator ¹
Not in excess of 20 f/cc	Reusable or single use air purifying respirator.
Not in excess of 100 f/cc	Full facepiece air purifying respirator.
Not in excess of 200 f/cc	Powered air purifying respirator.
Greater than 200 f/cc	A type "C" continuous flow or pressure demand, supplied air respirator.

¹Respirators specified for high concentrations may be used at lower concentrations of asbestos.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07517, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07517, filed 4/27/87. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-62-07517, filed

8/27/81; 81-16-015 (Order 81-20), § 296-62-07517, filed 7/27/81; 80-11-010 (Order 80-14), § 296-62-07517, filed 8/8/80; Order 77-12, § 296-62-07517, filed 7/11/77; Order 73-3, § 296-62-07517, filed 5/7/73.]

WAC 296-62-07521 Lead. (1) Scope and application.

(a) This section applies to all occupational exposure to lead, except as provided in subdivision (1)(b).

(b) This section does not apply to the construction industry or to agricultural operations covered by chapter 296-306 WAC.

(2) Definitions as applicable to this part.

(a) "Action level" - employee exposure, without regard to the use of respirators, to an airborne concentration of lead of thirty micrograms per cubic meter of air ($30 \mu\text{g}/\text{m}^3$) averaged over an eight-hour period.

(b) "Director" - the director of the department of labor and industries.

(c) "Lead" - metallic lead, all inorganic lead compounds, and organic lead soaps. Excluded from this definition are all other organic lead compounds.

(3) Permissible exposure limit (PEL).

(a) The employer shall assure that no employee is exposed to lead at concentrations greater than fifty micrograms per cubic meter of air ($50 \mu\text{g}/\text{m}^3$) averaged over an eight-hour period.

(b) If an employee is exposed to lead for more than eight hours in any work day, the permissible exposure limit, as a time weighted average (TWA) for that day, shall be reduced according to the following formula:

$$\text{Maximum permissible limit (in } \mu\text{g}/\text{m}^3) = 400 \div \text{hours worked in the day.}$$

(c) When respirators are used to supplement engineering and work practice controls to comply with the PEL and all the requirements of subsection (6) have been met, employee exposure, for the purpose of determining whether the employer has complied with the PEL, may be considered to be at the level provided by the protection factor of the respirator for those periods the respirator is worn. Those periods may be averaged with exposure levels during periods when respirators are not worn to determine the employee's daily TWA exposure.

(4) Exposure monitoring.

(a) General.

(i) For the purposes of subsection (4), employee exposure is that exposure which would occur if the employee were not using a respirator.

(ii) With the exception of monitoring under subdivision (4)(c), the employer shall collect full shift (for at least seven continuous hours) personal samples including at least one sample for each shift for each job classification in each work area.

(iii) Full shift personal samples shall be representative of the monitored employee's regular, daily exposure to lead.

(b) Initial determination. Each employer who has a workplace or work operation covered by this standard shall determine if any employee may be exposed to lead at or above the action level.

(c) Basis of initial determination.

(i) The employer shall monitor employee exposures and shall base initial determinations on the employee exposure monitoring results and any of the following, relevant considerations:

(A) Any information, observations, or calculations which would indicate employee exposure to lead;

(B) Any previous measurements of airborne lead; and

(C) Any employee complaints of symptoms which may be attributable to exposure to lead.

(ii) Monitoring for the initial determination may be limited to a representative sample of the exposed employees who the employer reasonably believes are exposed to the greatest airborne concentrations of lead in the workplace.

(iii) Measurements of airborne lead made in the preceding twelve months may be used to satisfy the requirement to monitor under item (4)(c)(i) if the sampling and analytical methods used meet the accuracy and confidence levels of subdivision (4)(i) of this section.

(d) Positive initial determination and initial monitoring.

(i) Where a determination conducted under subdivision (4)(b) and (4)(c) of this section shows the possibility of any employee exposure at or above the action level, the employer shall conduct monitoring which is representative of the exposure for each employee in the workplace who is exposed to lead.

(ii) Measurements of airborne lead made in the preceding twelve months may be used to satisfy this requirement if the sampling and analytical methods used meet the accuracy and confidence levels of subdivision (4)(i) of this section.

(e) Negative initial determination. Where a determination, conducted under subdivisions (4)(b) and (4)(c) of this section is made that no employee is exposed to airborne concentrations of lead at or above the action level, the employer shall make a written record of such determination. The record shall include at least the information specified in subdivision (4)(c) of this section and shall also include the date of determination, location within the worksite, and the name and social security number of each employee monitored.

(f) Frequency.

(i) If the initial monitoring reveals employee exposure to be below the action level the measurements need not be repeated except as otherwise provided in subdivision (4)(g) of this section.

(ii) If the initial determination or subsequent monitoring reveals employee exposure to be at or above the action level but below the permissible exposure limit the employer shall repeat monitoring in accordance with this subsection at least every six months. The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least seven days apart, are below the action level at which time the employer may discontinue monitoring for that employee except as otherwise provided in subdivision (4)(g) of this section.

(iii) If the initial monitoring reveals that employee exposure is above the permissible exposure limit the employer shall repeat monitoring quarterly. The employer shall continue monitoring at the required frequency until at least two consecutive measurements, taken at least seven days apart, are below the PEL but at or above the action level at which time the employer shall repeat monitoring for that employee at the frequency specified in item (4)(f)(ii), except as otherwise provided in subdivision (4)(g) of this section.

(g) Additional monitoring. Whenever there has been a production, process, control or personnel change which may result in new or additional exposure to lead, or whenever the employer has any other reason to suspect a change which may result in new or additional exposures to lead, additional monitoring in accordance with this subsection shall be conducted.

(h) Employee notification.

(i) Within five working days after the receipt of monitoring results, the employer shall notify each employee in writing of the results which represent that employee's exposure.

(ii) Whenever the results indicate that the representative employee exposure, without regard to respirators, exceeds the permissible exposure limit, the employer shall include in the written notice a statement that the permissible exposure limit was exceeded and a description of the corrective action taken or to be taken to reduce exposure to or below the permissible exposure limit.

(i) Accuracy of measurement. The employer shall use a method of monitoring and analysis which has an accuracy (to a confidence level of ninety-five percent) of not less than plus or minus twenty percent for airborne concentrations of lead equal to or greater than $30 \mu\text{g}/\text{m}^3$.

(5) Methods of compliance.

(a) Engineering and work practice controls.

(i) Where any employee is exposed to lead above the permissible exposure limit for more than thirty days per year, the employer shall implement engineering and work practice controls (including administrative controls) to reduce and maintain employee exposure to lead in accordance with the implementation schedule in Table I below, except to the extent that the employer can demonstrate that such controls are not feasible. Whenever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposure to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest feasible level and shall supplement them by the use of respiratory protection which complies with the requirements of subsection (6) of this section.

(ii) Where any employee is exposed to lead above the permissible exposure limit, but for thirty days or less per year, the employer shall implement engineering controls to reduce exposures to $200 \mu\text{g}/\text{m}^3$, but thereafter may implement any combination of engineering, work practice (including administrative controls), and respiratory controls to reduce and maintain employee exposure to lead to or below $50 \mu\text{g}/\text{m}^3$.

TABLE I
IMPLEMENTATION SCHEDULE

Industry ¹	Compliance Dates ²		
	200 $\mu\text{g}/\text{m}^3$	100 $\mu\text{g}/\text{m}^3$	50 $\mu\text{g}/\text{m}^3$
Primary lead production	(³)	3	10
Secondary lead production	(³)	3	5
Lead-acid battery manufacturing (³)	(³)	2	5
Automobile manufacture/ solder grinding	(³)	N/A	7
Electronics, gray iron found- ries, ink manufacture, paints and coatings man- ufacture, wall paper man- ufacture, can manufac- ture, and printing	(³)	N/A	1
Lead pigment manufacture, nonferrous foundries, leaded steel manufacture, lead chemical manufac- ture, shipbuilding and ship repair, battery breaking in the collection and pro- cessing of scrap (excluding collection and processing of scrap which is part of a secondary smelting op- eration), secondary lead smelting of copper, and lead casting	(³)	N/A	N/A
All other industries	(³)	N/A	2 1/2

Note: ¹Includes ancillary activities located on the same worksite.

²Expressed as the number of years from the effective date by which compliance with the given airborne exposure level, as an eight-hour TWA, must be achieved.

³On effective date. This continues an obligation from WAC 296-62-07515 Table 1 which had been in effect since 1973.

(b) Respiratory protection. Where engineering and work practice controls do not reduce employee exposure to or below the 50 $\mu\text{g}/\text{m}^3$ permissible exposure limit, the employer shall supplement these controls with respirators in accordance with subsection (6).

(c) Compliance program.

(i) Each employer shall establish and implement a written compliance program to reduce exposures to or below the permissible exposure limit, and interim levels if applicable, solely by means of engineering and work practice controls in accordance with the implementation schedule in subdivision (5)(a).

(ii) Written plans for these compliance programs shall include at least the following:

(A) A description of each operation in which lead is emitted; e.g., machinery used, material processed, controls in place, crew size, employee job responsibilities, operating procedures and maintenance practices;

(B) A description of the specific means that will be employed to achieve compliance, including engineering plans and studies used to determine methods selected for controlling exposure to lead;

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

(D) Air monitoring data which documents the source of lead emissions;

(E) A detailed schedule for implementation of the program, including documentation such as copies of

purchase orders for equipment, construction contracts, etc.;

(F) A work practice program which includes items required under subsections (7), (8) and (9) of this regulation;

(G) An administrative control schedule required by subdivision (5)(f), if applicable; and

(H) Other relevant information.

(iii) Written programs shall be submitted upon request to the director, and shall be available at the worksite for examination and copying by the director, any affected employee or authorized employee representatives.

(iv) Written programs shall be revised and updated at least every six months to reflect the current status of the program.

(d) Bypass of interim level. Where an employer's compliance plan provides for a reduction of employee exposures to or below the PEL solely by means of engineering and work practice controls in accordance with the implementation schedule in Table I, and the employer has determined that compliance with the 100 $\mu\text{g}/\text{m}^3$ interim level would divert resources to the extent that it clearly precludes compliance, otherwise attainable, with the PEL by the required time, the employer may proceed with the plan to comply with the PEL in lieu of compliance with the interim level if:

(i) The compliance plan clearly documents the basis of the determination;

(ii) The employer takes all feasible steps to provide maximum protection for employees until the PEL is met; and

(iii) The employer notifies the director in writing within ten working days of the completion or revision of the compliance plan reflecting the determination.

(e) Mechanical ventilation.

(i) When ventilation is used to control exposure, measurements which demonstrate the effectiveness of the system in controlling exposure, such as capture velocity, duct velocity, or static pressure shall be made at least every three months. Measurements of the system's effectiveness in controlling exposure shall be made within five days of any change in production, process, or control which might result in a change in employee exposure to lead.

(ii) Recirculation of air. If air from exhaust ventilation is recirculated into the workplace, the employer shall assure that (A) the system has a high efficiency filter with reliable back-up filter; and (B) controls to monitor the concentration of lead in the return air and to bypass the recirculation system automatically if it fails are installed, operating, and maintained.

(f) Administrative controls. If administrative controls are used as a means of reducing employees TWA exposure to lead, the employer shall establish and implement a job rotation schedule which includes:

(i) Name or identification number of each affected employee;

(ii) Duration and exposure levels at each job or work station where each affected employee is located; and

(iii) Any other information which may be useful in assessing the reliability of administrative controls to reduce exposure to lead.

(6) Respiratory protection.

(a) General. Where the use of respirators is required under this section, the employer shall provide, at no cost to the employee, and assure the use of respirators which comply with the requirements of this subsection. Respirators shall be used in the following circumstances:

(i) During the time period necessary to install or implement engineering or work practice controls, except that after the dates for compliance with the interim levels in Table I, no employer shall require an employee to wear a negative pressure respirator longer than 4.4 hours per day;

(ii) In work situations in which engineering and work practice controls are not sufficient to reduce exposures to or below the permissible exposure limit; and

(iii) Whenever an employee requests a respirator.

(b) Respirator selection.

(i) Where respirators are required under this section the employer shall select the appropriate respirator or combination of respirators from Table II.

TABLE II
RESPIRATORY PROTECTION FOR LEAD AEROSOLS

Airborne Concentration of Lead or Condition of Use	Required Respirator ¹
Not in excess of 0.5 mg/m ³ (10X PEL).	Half-mask, air-purifying respirator equipped with high efficiency filters. ^{2,3}
Not in excess of 2.5 mg/m ³ (50X PEL).	Full facepiece, air-purifying respirator with high efficiency filters. ³
Not in excess of 50 mg/m ³ (1000X PEL).	(1) Any powered, air-purifying respirator with high efficiency filters ³ ; or (2) Half-mask supplied air respirator operated in positive-pressure mode. ²
Not in excess of 100 mg/m ³ (2000X PEL).	Supplied-air respirators with full facepiece, hood, helmet, or suit, operated in positive pressure mode.
Greater than 100 mg/m ³ , unknown concentration or fire fighting.	Full facepiece, self-contained breathing apparatus operated in positive-pressure mode.

Note: ¹Respirators specified for high concentrations can be used at lower concentrations of lead.

²Full facepiece is required if the lead aerosols cause eye or skin irritation at the use concentrations.

³A high efficiency particulate filter means 99.97 percent efficient against 0.3 micron size particles.

(ii) The employer shall provide a powered, air-purifying respirator in lieu of the respirator specified, in Table II whenever:

(A) An employee chooses to use this type of respirator; and

(B) This respirator will provide adequate protection to the employee.

(iii) The employer shall select respirators from among those approved for protection against lead dust, fume, and mist by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11.

(c) Respirator usage.

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

(ii) Employers shall perform either quantitative or qualitative face fit tests at the time of initial fitting and at least every six months thereafter for each employee wearing negative pressure respirators. The qualitative fit tests may be used only for testing the fit of half-mask respirators where they are permitted to be worn, and shall be conducted in accordance with Appendix D. The tests shall be used to select facepieces that provide the required protection as prescribed in Table II.

(iii) If an employee exhibits difficulty in breathing during the fitting test or during use, the employer shall make available to the employee an examination in accordance with subitem (10)(c)(i)(C) of this section to determine whether the employee can wear a respirator while performing the required duty.

(d) Respirator program.

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

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

(iii) Employees who wear respirators shall be permitted to leave work areas to wash their face and respirator facepiece whenever necessary to prevent skin irritation associated with respirator use.

(7) Protective work clothing and equipment.

(a) Provision and use. If an employee is exposed to lead above the PEL, without regard to the use of respirators or where the possibility of skin or eye irritation exists, the employer shall provide at no cost to the employee and assure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

(i) Coveralls or similar full-body work clothing;

(ii) Gloves, hats, and shoes or disposable shoe covers; and

(iii) Face shields, vented goggles, or other appropriate protective equipment which complies with WAC 296-24-078.

(b) Cleaning and replacement.

(i) The employer shall provide the protective clothing required in subdivision (7)(a) of this section in a clean and dry condition at least weekly, and daily to employees whose exposure levels without regard to a respirator are over 200 µg/m³ of lead as an eight-hour TWA.

(ii) The employer shall provide for the cleaning, laundering, or disposal of protective clothing and equipment required by subdivision (7)(a) of this section.

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

(iv) The employer shall assure that all protective clothing is removed at the completion of a work shift only in change rooms provided for that purpose as prescribed in subdivision (9)(b) of this section.

(v) The employer shall assure that contaminated protective clothing which is to be cleaned, laundered, or disposed of, is placed in a closed container in the change-room which prevents dispersion of lead outside the container.

(vi) The employer shall inform in writing any person who cleans or launders protective clothing or equipment of the potentially harmful effects of exposure to lead.

(vii) The employer shall assure that the containers of contaminated protective clothing and equipment required by subdivision (7)(b)(v) are labeled as follows:

CAUTION: CLOTHING CONTAMINATED WITH LEAD.
DO NOT REMOVE DUST BY BLOWING OR SHAKING.
DISPOSE OF LEAD CONTAMINATED WASH WATER IN
ACCORDANCE WITH APPLICABLE LOCAL, STATE, OR
FEDERAL REGULATIONS.

(viii) The employer shall prohibit the removal of lead from protective clothing or equipment by blowing, shaking, or any other means which disperses lead into the air.

(8) Housekeeping.

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

(b) Cleaning floors.

(i) Floors and other surfaces where lead accumulates may not be cleaned by the use of compressed air.

(ii) Shoveling, dry or wet sweeping, and brushing may be used only where vacuuming or other equally effective methods have been tried and found not to be effective.

(c) Vacuuming. Where vacuuming methods are selected, the vacuums shall be used and emptied in a manner which minimizes the reentry of lead into the workplace.

(9) Hygiene facilities and practices.

(a) The employer shall assure that in areas where employees are exposed to lead above the PEL, without regard to the use of respirators, food or beverage is not present or consumed, tobacco products are not present or used, and cosmetics are not applied, except in change rooms, lunchrooms, and showers required under subdivision (9)(b) through (9)(d) of this section.

(b) Change rooms.

(i) The employer shall provide clean change rooms for employees who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators.

(ii) The employer shall assure that change rooms are equipped with separate storage facilities for protective work clothing and equipment and for street clothes which prevent cross-contamination.

(c) Showers.

(i) The employer shall assure that employees who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators, shower at the end of the work shift.

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

(iii) The employer shall assure that employees who are required to shower pursuant to item (9)(c)(i) do not leave the workplace wearing any clothing or equipment worn during the work shift.

(d) Lunchrooms.

(i) The employer shall provide lunchroom facilities for employees who work in areas where their airborne exposure to lead is above the PEL, without regard to the use of respirators.

(ii) The employer shall assure that lunchroom facilities have a temperature controlled, positive pressure, filtered air supply, and are readily accessible to employees.

(iii) The employer shall assure that employees who work in areas where their airborne exposure to lead is above the PEL without regard to the use of a respirator wash their hands and face prior to eating, drinking, smoking or applying cosmetics.

(iv) The employer shall assure that employees do not enter lunchroom facilities with protective work clothing or equipment unless surface lead dust has been removed by vacuuming, downdraft booth, or other cleaning method.

(e) Lavatories. The employer shall provide an adequate number of lavatory facilities which comply with WAC 296-24-12009 (1) and (2).

(10) Medical surveillance.

(a) General.

(i) The employer shall institute a medical surveillance program for all employees who are or may be exposed above the action level for more than thirty days per year.

(ii) The employer shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician.

(iii) The employer shall provide the required medical surveillance including multiple physician review under item (10)(c)(iii) without cost to employees and at a reasonable time and place.

(b) Biological monitoring.

(i) Blood lead and ZPP level sampling and analysis.

The employer shall make available biological monitoring in the form of blood sampling and analysis for lead and zinc protoporphyrin levels to each employee covered under item (10)(a)(i) of this section on the following schedule:

(A) At least every six months to each employee covered under item (10)(a)(i) of this section;

(B) At least every two months for each employee whose last blood sampling and analysis indicated a blood lead level at or above 40 $\mu\text{g}/100\text{ g}$ of whole blood. This frequency shall continue until two consecutive blood samples and analyses indicate a blood lead level below 40 $\mu\text{g}/100\text{ g}$ of whole blood; and

(C) At least monthly during the removal period of each employee removed from exposure to lead due to an elevated blood lead level.

(ii) Follow-up blood sampling tests. Whenever the results of a blood lead level test indicate that an employee's blood lead level exceeds the numerical criterion for medical removal under item (11)(a)(i), the employer shall provide a second (follow-up) blood sampling test within two weeks after the employer receives the results of the first blood sampling test.

(iii) Accuracy of blood lead level sampling and analysis. Blood lead level sampling and analysis provided pursuant to this section shall have an accuracy (to a

confidence level of ninety-five percent) within plus or minus fifteen percent or 6 $\mu\text{g}/100$ ml, whichever is greater, and shall be conducted by a laboratory licensed by the Center for Disease Control (CDC), United States Department of Health, Education and Welfare or which has received a satisfactory grade in blood lead proficiency testing from CDC in the prior twelve months.

(iv) Employee notification. Within five working days after the receipt of biological monitoring results, the employer shall notify in writing each employee whose blood lead level exceeds 40 $\mu\text{g}/100$ g: (A) of that employee's blood lead level and (B) that the standard requires temporary medical removal with medical removal protection benefits when an employee's blood lead level exceeds the numerical criterion for medical removal under item (11)(a)(i) of this section.

(c) Medical examinations and consultations.

(i) Frequency. The employer shall make available medical examinations and consultations to each employee covered under item (10)(a)(i) of this section on the following schedule:

(A) At least annually for each employee for whom a blood sampling test conducted at any time during the preceding twelve months indicated a blood lead level at or above 40 $\mu\text{g}/100$ g;

(B) Prior to assignment for each employee being assigned for the first time to an area in which airborne concentrations of lead are at or above the action level;

(C) As soon as possible, upon notification by an employee either that the employee has developed signs or symptoms commonly associated with lead intoxication, that the employee desires medical advice concerning the effects of current or past exposure to lead on the employee's ability to procreate a healthy child, or that the employee has demonstrated difficulty in breathing during a respirator fitting test or during use; and

(D) As medically appropriate for each employee either removed from exposure to lead due to a risk of sustaining material impairment to health, or otherwise limited pursuant to a final medical determination.

(ii) Content. Medical examinations made available pursuant to subitems (10)(c)(i)(A) through (B) of this section shall include the following elements:

(A) A detailed work history and a medical history, with particular attention to past lead exposure (occupational and nonoccupational), personal habits (smoking, hygiene), and past gastrointestinal, hematologic, renal, cardiovascular, reproductive and neurological problems;

(B) A thorough physical examination, with particular attention to teeth, gums, hematologic, gastrointestinal, renal, cardiovascular, and neurological systems. Pulmonary status should be evaluated if respiratory protection will be used;

(C) A blood pressure measurement;

(D) A blood sample and analysis which determines:

(I) Blood lead level;

(II) Hemoglobin and hematocrit determinations, red cell indices, and examination of peripheral smear morphology;

(III) Zinc protoporphyrin;

(IV) Blood urea nitrogen; and

(V) Serum creatinine;

(E) A routine urinalysis with microscopic examination; and

(F) Any laboratory or other test which the examining physician deems necessary by sound medical practice.

The content of medical examinations made available pursuant to subitems (10)(c)(i)(C) through (D) of this section shall be determined by an examining physician and, if requested by an employee, shall include pregnancy testing or laboratory evaluation of male fertility.

(iii) Multiple physician review mechanism.

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

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

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

(B) The employer shall promptly notify an employee of the right to seek a second medical opinion after each occasion that an initial physician conducts a medical examination or consultation pursuant to this section. The employer may condition its participation in, and payment for, the multiple physician review mechanism upon the employee doing the following within fifteen days after receipt of the foregoing notification, or receipt of the initial physician's written opinion, whichever is later:

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

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

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

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

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

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

(E) The employer shall act consistent with the findings, determinations and recommendations of the third physician, unless the employer and the employee reach an agreement which is otherwise consistent with the recommendations of at least one of the three physicians.

(iv) Information provided to examining and consulting physicians.

(A) The employer shall provide an initial physician conducting a medical examination or consultation under this section with the following information:

(I) A copy of this regulation for lead including all appendices;

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

(III) The employee's exposure level or anticipated exposure level to lead and to any other toxic substance (if applicable);

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

(V) Prior blood lead determinations; and

(VI) All prior written medical opinions concerning the employee in the employer's possession or control.

(B) The employer shall provide the foregoing information to a second or third physician conducting a medical examination or consultation under this section upon request either by the second or third physician, or by the employee.

(v) Written medical opinions.

(A) The employer shall obtain and furnish the employee with a copy of a written medical opinion from each examining or consulting physician which contains the following information:

(I) The physician's opinion as to whether the employee has any detected medical condition which would place the employee at increased risk of material impairment of the employee's health from exposure to lead;

(II) Any recommended special protective measures to be provided to the employee, or limitations to be placed upon the employee's exposure to lead;

(III) Any recommended limitation upon the employee's use of respirators, including a determination of whether the employee can wear a powered air purifying respirator if a physician determines that the employee cannot wear a negative pressure respirator; and

(IV) The results of the blood lead determinations.

(B) The employer shall instruct each examining and consulting physician to:

(I) Not reveal either in the written opinion, or in any other means of communication with the employer, findings, including laboratory results, or diagnoses unrelated to an employee's occupational exposure to lead; and

(II) Advise the employee of any medical condition, occupational or nonoccupational, which dictates further medical examination or treatment.

(vi) Alternate physician determination mechanisms. The employer and an employee or authorized employee representative may agree upon the use of any expeditious alternate physician determination mechanism in lieu of the multiple physician review mechanism provided by this subsection so long as the alternate mechanism otherwise satisfies the requirements contained in this subsection.

(d) Chelation.

(i) The employer shall assure that any person whom he retains, employs, supervises or controls does not engage in prophylactic chelation of any employee at any time.

(ii) If therapeutic or diagnostic chelation is to be performed by any person in item (10)(d)(i), the employer shall assure that it be done under the supervision of a licensed physician in a clinical setting with thorough and appropriate medical monitoring and that the employee is notified in writing prior to its occurrence.

(11) Medical removal protection.

(a) Temporary medical removal and return of an employee.

(i) Temporary removal due to elevated blood lead levels.

(A) First year of the standard. During the first year following the effective date of the standard, the employer shall remove an employee from work having a daily eight hour TWA exposure to lead at or above 100 $\mu\text{g}/\text{m}^3$ on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to this section indicate that the employee's blood lead level is at or above 80 $\mu\text{g}/100$ g of whole blood;

(B) Second year of the standard. During the second year following the effective date of the standard, the employer shall remove an employee from work having a daily eight hour TWA exposure to lead at or above 50 $\mu\text{g}/\text{m}^3$ on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to this section indicate that the employee's blood lead level is at or above 70 $\mu\text{g}/100$ g of whole blood;

(C) Third year of the standard, and thereafter. Beginning with the third year following the effective date of the standard, the employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that a periodic and a follow-up blood sampling test conducted pursuant to this section indicate that the employee's blood lead level is at or above 60 $\mu\text{g}/100$ g of whole blood; and

(D) Fifth year of the standard, and thereafter. Beginning with the fifth year following the effective date of the standard, the employer shall remove an employee from work having an exposure to lead at or above the action level on each occasion that the average of the last three blood sampling tests conducted pursuant to this section (or the average of all blood sampling tests conducted over the previous six months, whichever is longer) indicates that the employee's blood lead level is at or above 50 $\mu\text{g}/100$ g of whole blood; provided, however, that an employee need not be removed if the last blood sampling test indicates a blood lead level at or below 40 $\mu\text{g}/100$ g of whole blood.

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

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

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

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

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

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

(I) For an employee removed due to a blood lead level at or above 80 $\mu\text{g}/100\text{ g}$, when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below 60 $\mu\text{g}/100\text{ g}$ of whole blood;

(II) For an employee removed due to a blood lead level at or above 70 $\mu\text{g}/100\text{ g}$, when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below 50 $\mu\text{g}/100\text{ g}$ of whole blood;

(III) For an employee removed due to a blood lead level at or above 60 $\mu\text{g}/100\text{ g}$, or due to an average blood lead level at or above 50 $\mu\text{g}/100\text{ g}$, when two consecutive blood sampling tests indicate that the employee's blood lead level is at or below 40 $\mu\text{g}/100\text{ g}$ of whole blood;

(IV) For an employee removed due to a final medical determination, when a subsequent final medical determination results in a medical finding, determination, or opinion that the employee no longer has a detected medical condition which places the employee at increased risk of material impairment to health from exposure to lead.

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

(iv) Removal of other employee special protective measure or limitations. The employer shall remove any limitations placed on an employee or end any special protective measures provided to an employee pursuant to a final medical determination when a subsequent final medical determination indicates that the limitations or special protective measures are no longer necessary.

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

(A) Removal. The employer may remove the employee from exposure to lead, provide special protective measures to the employee, or place limitations upon the employee, consistent with the medical findings, determinations, or recommendations of any of the physicians who have reviewed the employee's health status.

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

(I) The initial removal, special protection, or limitation of the employee resulted from a final medical determination which differed from the findings,

determinations, or recommendations of the initial physician; or

(II) The employee has been on removal status for the preceding eighteen months due to an elevated blood lead level, then the employer shall await a final medical determination.

(b) Medical removal protection benefits.

(i) Provision of medical removal protection benefits. The employer shall provide to an employee up to eighteen months of medical removal protection benefits on each occasion that an employee is removed from exposure to lead or otherwise limited pursuant to this section.

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

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

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

(v) Other credits. The employer's obligation to provide medical removal protection benefits to a removed employee shall be reduced to the extent that the employee receives compensation for earnings lost during the period of removal either from a publicly or employer-funded compensation program, or receives income from employment with another employer made possible by virtue of the employee's removal.

(vi) Employees whose blood lead levels do not adequately decline within eighteen months of removal. The employer shall take the following measures with respect to any employee removed from exposure to lead due to an elevated blood lead level whose blood lead level has not declined within the past eighteen months of removal so that the employee has been returned to his or her former job status:

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

(B) The employer shall assure that the final medical determination obtained indicates whether or not the employee may be returned to his or her former job status,

and if not, what steps should be taken to protect the employee's health;

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

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

(vii) Voluntary removal or restriction of an employee. Where an employer, although not required by this section to do so, removes an employee from exposure to lead or otherwise places limitations on an employee due to the effects of lead exposure on the employee's medical condition, the employer shall provide medical removal protection benefits to the employee equal to that required by item (11)(b)(i) of this section.

(12) Employee information and training.

(a) Training program.

(i) Each employer who has a workplace in which there is a potential exposure to airborne lead at any level shall inform employees of the content of Appendices A and B of this regulation.

(ii) The employer shall institute a training program for and assure the participation of all employees who are subject to exposure to lead at or above the action level or for whom the possibility of skin or eye irritation exists.

(iii) The employer shall provide initial training by one hundred eighty days from the effective date for those employees covered by item (12)(a)(ii) on the standard's effective date and prior to the time of initial job assignment for those employees subsequently covered by this subsection.

(iv) The training program shall be repeated at least annually for each employee.

(v) The employer shall assure that each employee is informed of the following:

(A) The content of this standard and its appendices;

(B) The specific nature of the operations which could result in exposure to lead above the action level;

(C) The purpose, proper selection, fitting, use, and limitations of respirators;

(D) The purpose and a description of the medical surveillance program, and the medical removal protection program including information concerning the adverse health effects associated with excessive exposure to lead (with particular attention to the adverse reproductive effects on both males and females);

(E) The engineering controls and work practices associated with the employee's job assignment;

(F) The contents of any compliance plan in effect; and
(G) Instructions to employees that chelating agents should not routinely be used to remove lead from their bodies and should not be used at all except under the direction of a licensed physician.

(b) Access to information and training materials.

(i) The employer shall make readily available to all affected employees a copy of this standard and its appendices.

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

(iii) In addition to the information required by item (12)(a)(v), the employer shall include as part of the training program, and shall distribute to employees, any materials pertaining to the Occupational Safety and Health Act, the regulations issued pursuant to the act, and this lead standard, which are made available to the employer by the director.

(13) Signs.

(a) General.

(i) The employer may use signs required by other statutes, regulations or ordinances in addition to, or in combination with, signs required by this subsection.

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

(b) Signs.

(i) The employer shall post the following warning signs in each work area where the PEL is exceeded:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING

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

(14) Recordkeeping.

(a) Exposure monitoring.

(i) The employer shall establish and maintain an accurate record of all monitoring required in subsection (4) of this section.

(ii) This record shall include:

(A) The date(s), number, duration, location and results of each of the samples taken, including a description of the sampling procedure used to determine representative employee exposure where applicable;

(B) A description of the sampling and analytical methods used and evidence of their accuracy;

(C) The type of respiratory protective devices worn, if any;

(D) Name, social security number, and job classification of the employee monitored and of all other employees whose exposure the measurement is intended to represent; and

(E) the environmental variables that could affect the measurement of employee exposure.

(iii) The employer shall maintain these monitoring records for at least forty years or for the duration of employment plus twenty years, whichever is longer.

(b) Medical surveillance.

(i) The employer shall establish and maintain an accurate record for each employee subject to medical surveillance as required by subsection (10) of this section.

(ii) This record shall include:

(A) The name, social security number, and description of the duties of the employee;

(B) A copy of the physician's written opinions;

(C) Results of any airborne exposure monitoring done for that employee and the representative exposure levels supplied to the physician; and

(D) Any employee medical complaints related to exposure to lead.

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

(A) A copy of the medical examination results including medical and work history required under subsection (10) of this section;

(B) A description of the laboratory procedures and a copy of any standards or guidelines used to interpret the test results or references to that information; and

(C) A copy of the results of biological monitoring.

(iv) The employer shall maintain or assure that the physician maintains those medical records for at least forty years, or for the duration of employment plus twenty years, whichever is longer.

(c) Medical removals.

(i) The employer shall establish and maintain an accurate record for each employee removed from current exposure to lead pursuant to subsection (11) of this section.

(ii) Each record shall include:

(A) The name and social security number of the employee;

(B) The date on each occasion that the employee was removed from current exposure to lead as well as the corresponding date on which the employee was returned to his or her former job status;

(C) A brief explanation of how each removal was or is being accomplished; and

(D) A statement with respect to each removal indicating whether or not the reason for the removal was an elevated blood lead level.

(iii) The employer shall maintain each medical removal record for at least the duration of an employee's employment.

(d) Availability.

(i) The employer shall make available upon request all records required to be maintained by subsection (14) of this section to the director for examination and copying.

(ii) Environmental monitoring, medical removal, and medical records required by this subsection shall be provided upon request to employees, designated representatives, and the assistant director in accordance with WAC 296-62-05201 through 296-62-05209 and 296-62-05213 through 296-62-05217. Medical removal records shall be provided in the same manner as environmental monitoring records.

(iii) Upon request, the employer shall make an employee's medical records required to be maintained by this section available to the affected employee or former employee or to a physician or other individual designated by such affected employee or former employees for examination and copying.

(e) Transfer of records.

(i) Whenever the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained by subsection (14) of this section.

(ii) Whenever the employer ceases to do business and there is no successor employer to receive and retain the records required to be maintained by this section for the prescribed period, these records shall be transmitted to the director.

(iii) At the expiration of the retention period for the records required to be maintained by this section, the employer shall notify the director at least three months prior to the disposal of such records and shall transmit those records to the director if requested within the period.

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

(15) Observation of monitoring.

(a) Employee observation. The employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to lead conducted pursuant to subsection (4) of this section.

(b) Observation procedures.

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

(ii) Without interfering with the monitoring, observers shall be entitled to:

(A) Receive an explanation of the measurement procedures;

(B) Observe all steps related to the monitoring of lead performed at the place of exposure; and

(C) Record the results obtained or receive copies of the results when returned by the laboratory.

(16) Effective date. The effective date of this standard is September 6, 1980.

(17) Appendices. The information contained in the appendices to this section is not intended by itself, to create any additional obligations not otherwise imposed by this standard nor detract from any existing obligation. Appendices are available from:

The Technical Services Section
Division of Industrial Safety and Health
P.O. Box 207
Olympia, WA 98504 (206) 753-6381

(18) Startup dates. All obligations of this standard commence on the effective date except as follows:

(a) The initial determination under subdivision (4)(b) shall be made as soon as possible but no later than thirty days from the effective date.

(b) Initial monitoring under subdivision (4)(d) shall be completed as soon as possible but no later than ninety days from the effective date.

(c) Initial biological monitoring and medical examinations under subsection (10) shall be completed as soon as possible but no later than one hundred eighty days from the effective date. Priority for biological monitoring and medical examinations shall be given to employees whom the employer believes to be at greatest risk from continued exposure.

(d) Initial training and education shall be completed as soon as possible but no later than one hundred eighty days from the effective date.

(e) Hygiene and lunchroom facilities under subsection (9) shall be in operation as soon as possible but no later than one year from the effective year.

(f) Respiratory protection required by subsection (6) shall be provided as soon as possible but no later than the following schedule:

(i) Employees whose eight-hour TWA exposure exceeds $200 \mu\text{g}/\text{m}^3$ - on the effective date.

(ii) Employees whose eight-hour TWA exposure exceeds the PEL but is less than $200 \mu\text{g}/\text{m}^3$ - one hundred fifty days from the effective date.

(iii) Powered, air-purifying respirators provided under (6)(b)(ii) - two hundred ten days from the effective date.

(iv) Quantitative fit testing required under item (6)(c)(ii) - one year from effective date. Qualitative fit testing is required in the interim.

(g) Written compliance plans required by subdivision (5)(c) shall be completed and available for inspection and copying as soon as possible but no later than the following schedule:

(i) Employers for whom compliance with the PEL or interim level is required within one year from the effective date - six months from the effective date.

(ii) Employers in secondary smelting and refining, lead storage battery manufacturing, lead pigment manufacturing and nonferrous foundry industries - one year from the effective date.

(iii) Employers in primary smelting and refining industry - one year from the effective date from the interim level; five years from the effective date for PEL.

(iv) Plans for construction of hygiene facilities, if required - six months from the effective date.

(h) The permissible exposure limit in subsection (3) shall become effective one hundred fifty days from the effective date.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-62-07521, filed 7/6/88. Statutory Authority: RCW 49.17-.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-62-07521, filed 11/30/83; 82-13-045 (Order 82-22), § 296-62-07521, filed 6/11/82. Formerly WAC 296-62-07349.]

WAC 296-62-07523 Benzene. (1) Scope and application.

(a) This section applies to all occupational exposures to benzene. Chemical Abstracts Service Registry No. 71-43-2, except as provided in (b) and (c) of this subsection.

(b) This section does not apply to:

(i) The storage, transportation, distribution, dispensing, sale or use of gasoline, motor fuels, or other fuels containing benzene subsequent to its final discharge from bulk wholesale storage facilities, except that operations where gasoline or motor fuels are dispensed for more than four hours per day in an indoor location are covered by this section.

(ii) Loading and unloading operations at bulk wholesale storage facilities which use vapor control systems for all loading and unloading operations, except for the provisions of WAC 296-62-054 as incorporated into this section and the emergency provisions of subsections (7) and (9)(d) of this section.

(iii) The storage, transportation, distribution, or sale of benzene or liquid mixtures containing more than 0.1 percent benzene in intact containers or in transportation pipelines while sealed in such a manner as to contain benzene vapors or liquid, except for the provisions of WAC 296-62-054 as incorporated into this section and the emergency provisions of subsections (7) and (9)(d) of this section.

(iv) Containers and pipelines carrying mixtures with less than 0.1 percent benzene and natural gas processing plants processing gas with less than 0.1 percent benzene.

(v) Work operations where the only exposure to benzene is from liquid mixtures containing 0.5 percent or less of benzene by volume, or the vapors released from such liquids until September 12, 1988; work operations where the only exposure to benzene is from liquid mixtures containing 0.3 percent or less of benzene by volume or the vapors released from such liquids from September 12, 1988, to September 12, 1989; and work operations where the only exposure to benzene is from liquid mixtures containing 0.1 percent or less of benzene by volume or the vapors released from such liquids after September 12, 1989; except that tire building machine operators using solvents with more than 0.1 percent benzene are covered by subsection (9) of this section.

(vi) Oil and gas drilling, production, and servicing operations.

(vii) Coke oven batteries.

(c) The cleaning and repair of barges and tankers which have contained benzene are excluded from subsection (6) of this section (Methods of compliance), subsection (5)(a) of this section (General), and subsection (5)(f) of this section (Accuracy of monitoring). Engineering and work practice controls shall be used to keep exposures below 10 ppm unless it is proven to be not feasible.

(2) Definitions.

(a) "Action level" means an airborne concentration of benzene of 0.5 ppm calculated as an 8-hour time-weighted average.

(b) "Authorized person" means any person specifically authorized by the employer whose duties require

the person to enter a regulated area, or any person entering such an area as a designated representative of employees for the purpose of exercising the right to observe monitoring and measuring procedures under subsection (5) of this section, or any other person authorized by the Washington Industrial Safety and Health Act (WISHA) or regulations issued under WISHA.

(c) "Benzene" (C₆H₆) (CAS Registry No. 71-43-2) means liquefied or gaseous benzene. It includes benzene contained in liquid mixtures and the benzene vapors released by these liquids. It does not include trace amounts of unreacted benzene contained in solid materials.

(d) "Bulk wholesale storage facility" means a bulk terminal or bulk plant where fuel is stored prior to its delivery to wholesale customers.

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

(f) "Day" means any part of a calendar day.

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

(h) "Emergency" means any occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment which may or does result in an unexpected significant release of benzene.

(i) "Employee exposure" means exposure to airborne benzene which would occur if the employee were not using respiratory protective equipment.

(j) "Regulated area" means any area where airborne concentrations of benzene exceed or can reasonably be expected to exceed, the permissible exposure limits, either the 8-hour time-weighted average exposure of 1 ppm or the short-term exposure limit of 5 ppm for fifteen minutes.

(k) "Vapor control system" means any equipment used for containing the total vapors displaced during the loading of gasoline, motor fuel, or other fuel tank trucks and the displacing of these vapors through a vapor processing system or balancing the vapor with the storage tank. This equipment also includes systems containing the vapors displaced from the storage tank during the unloading of the tank truck which balance the vapors back to the tank truck.

(3) Permissible exposure limits (PELs).

(a) Time-weighted average limit (TWA). The employer shall assure that no employee is exposed to an airborne concentration of benzene in excess of one part of benzene per million parts of air (1 ppm) as an 8-hour time-weighted average.

(b) Short-term exposure limit (STEL). The employer shall assure that no employee is exposed to an airborne concentration of benzene in excess of 5 ppm as averaged over any fifteen minute period.

(4) Regulated areas.

(a) The employer shall establish a regulated area wherever the airborne concentration of benzene exceeds or can reasonably be expected to exceed the permissible

exposure limits, either the 8-hour time-weighted average exposure of 1 ppm or the short-term exposure limit of 5 ppm for fifteen minutes.

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

(c) Regulated areas shall be determined from the rest of the workplace in any manner that minimizes the number of employees exposed to benzene within the regulated area.

(5) Exposure monitoring.

(a) General.

(i) Determinations of employee exposure shall be made from breathing zone air samples that are representative of each employee's average exposure to airborne benzene.

(ii) Representative 8-hour TWA employee exposures shall be determined on the basis of one sample or samples representing the full shift exposure for each job classification in each work area.

(iii) Determinations of compliance with the STEL shall be made from fifteen minute employee breathing zone samples measured at operations where there is reason to believe exposures are high, such as where tanks are opened, filled, unloaded, or gauged; where containers or process equipment are opened and where benzene is used for cleaning or as a solvent in an uncontrolled situation. The employer may use objective data, such as measurements from brief period measuring devices, to determine where STEL monitoring is needed.

(iv) Except for initial monitoring as required under (b) of this subsection, where the employer can document that one shift will consistently have higher employee exposures for an operation, the employer shall only be required to determine representative employee exposure for that operation during the shift on which the highest exposure is expected.

(b) Initial monitoring.

(i) Each employer who has a place of employment covered under subsection (1)(a) of this section shall monitor each of these workplaces and work operations to determine accurately the airborne concentrations of benzene to which employees may be exposed.

(ii) The initial monitoring required under (b)(i) of this subsection shall be completed by sixty days after the effective date of this standard or within thirty days of the introduction of benzene into the workplace. Where the employer has monitored within one year prior to the effective date of this standard and the monitoring satisfies all other requirements of this section, the employer may rely on such earlier monitoring results to satisfy the requirements of (b)(i) of this subsection.

(c) Periodic monitoring and monitoring frequency.

(i) If the monitoring required by (b)(i) of this subsection reveals employee exposure at or above the action level but at or below the TWA, the employer shall repeat such monitoring for each such employee at least every year.

(ii) If the monitoring required by (b)(i) of this subsection reveals employee exposure above the TWA, the employer shall repeat such monitoring for each such employee at least every six months.

(iii) The employer may alter the monitoring schedule from every six months to annually for any employee for whom two consecutive measurements taken at least seven days apart indicate that the employee exposure has decreased to the TWA or below, but is at or above the action level.

(iv) Monitoring for the STEL shall be repeated as necessary to evaluate exposures of employees subject to short term exposures.

(d) Termination of monitoring.

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

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

(e) Additional monitoring.

(i) The employer shall institute the exposure monitoring required under (b) and (c) of this subsection when there has been a change in the production, process, control equipment, personnel, or work practices which may result in new or additional exposures to benzene, or when the employer has any reason to suspect a change which may result in new or additional exposures.

(ii) Whenever spills, leaks, ruptures, or other breakdowns occur that may lead to employee exposure, the employer shall monitor (using area or personal sampling) after the cleanup of the spill or repair of the leak, rupture or other breakdown to ensure that exposures have returned to the level that existed prior to the incident.

(f) Accuracy of monitoring. Monitoring shall be accurate, to a confidence level of ninety-five percent, to within plus or minus twenty-five percent for airborne concentrations of benzene.

(g) Employee notification of monitoring results.

(i) The employer shall, within fifteen working days after the receipt of the results of any monitoring performed under this standard, notify each employee of these results in writing either individually or by posting of results in an appropriate location that is accessible to affected employees.

(ii) Whenever the PELs are exceeded, the written notification required by (g)(i) of this subsection shall contain the corrective action being taken by the employer to reduce the employee exposure to or below the PEL, or shall refer to a document available to the employee which states the corrective actions to be taken.

(6) Methods of compliance.

(a) Engineering controls and work practices.

(i) The employer shall institute engineering controls and work practices to reduce and maintain employee exposure to benzene at or below the permissible exposure limits, except to the extent that the employer can establish that these controls are not feasible or where the

provisions of (a)(iii) of this subsection or subsection (7)(a) of this section apply.

(ii) Wherever the feasible engineering controls and work practices which can be instituted are not sufficient to reduce employee exposure to or below the PELs, the employer shall use them to reduce employee exposure to the lowest levels achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of subsection (7) of this section.

(iii) Where the employer can document that benzene is used in a workplace less than a total of thirty days per year, the employer shall use engineering controls, work practice controls or respiratory protection or any combination of these controls to reduce employee exposure to benzene to or below the PELs, except that employers shall use engineering and work practice controls, if feasible, to reduce exposure to or below 10 ppm as an 8-hour TWA.

(b) Compliance program.

(i) When any exposures are over the PEL, the employer shall establish and implement a written program to reduce employee exposure to or below the PEL primarily by means of engineering and work practice controls, as required by (a) of this subsection.

(ii) The written program shall include a schedule for development and implementation of the engineering and work practice controls. These plans shall be reviewed and revised as appropriate based on the most recent exposure monitoring data, to reflect the current status of the program.

(iii) Written compliance programs shall be furnished upon request for examination and copying to the director, affected employees, and designated employee representatives.

(7) Respiratory protection.

(a) General. The employer shall provide respirators, and assure that they are used, where required by this section. Respirators shall be used in the following circumstances:

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

(ii) In work operations for which the employer establishes that compliance with either the TWA or STEL through the use of engineering and work practice controls is not feasible, such as some maintenance and repair activities, vessel cleaning, or other operations where engineering and work practice controls are infeasible because exposures are intermittent in nature and limited in duration;

(iii) In work situations where feasible engineering and work practice controls are not yet sufficient or are not required under subsection (6)(a)(iii) of this section to reduce exposure to or below the PELs; and

(iv) In emergencies.

(b) Respirator selection.

(i) Where respirators are required or allowed under this section, the employer shall select and provide, at no cost to the employee, the appropriate respirator as specified in Table 1 of this section, and shall assure that the employee uses the respirator provided.

(ii) The employer shall select respirators from among those jointly approved by the Mine Safety and Health Administration and the National Institute for Occupational Safety and Health under the provisions of 30 CFR Part 11. Negative pressure respirators shall have filter elements approved by MSHA/NIOSH for organic vapors or benzene.

(iii) Any employee who cannot wear a negative pressure respirator shall be given the option of wearing a respirator with less breathing resistance such as a powered air-purifying respirator or supplied air respirator.

(c) Respirator program. The employer shall institute a respiratory protection program in accordance with Part E, Respiratory protection, WAC 296-62-071 through 296-62-07121.

(d) Respirator use.

(i) Where air-purifying respirators are used, the employer shall replace the air purifying element at the expiration of service life or at the beginning of each shift in which they will be used, whichever comes first.

(ii) If an air purifying element becomes available with an end of useful life indicator for benzene approved by MSHA/NIOSH, the element may be used until such time as the indicator shows no further useful life.

(iii) The employer shall permit employees who wear respirators to leave the regulated area to wash their faces and respirator facepieces as necessary in order to prevent skin irritation associated with respirator use or to change the filter elements of air-purifying respirators whenever they detect a change in breathing resistance or chemical vapor breakthrough.

(e) Respirator fit testing.

(i) The employer shall perform, and certify the results of, either quantitative or qualitative fit tests at the time of initial fitting and at least annually thereafter for each employee wearing a negative pressure respirator. The test shall be used to select a respirator facepiece which exhibits minimum leakage and provides the required protection as prescribed in Table 1 of this section. The employer shall provide and assure that the employee wears a respirator demonstrated by the fit test to provide the required protection.

(ii) The employer shall follow the test protocols outlined in Appendix E of this standard for whichever type of fit testing the employer chooses.

TABLE 1. - RESPIRATORY PROTECTION FOR BENZENE

Airborne concentration of benzene or condition of use	Respirator type
(a) Less than or equal to 10 ppm.	(1) Half-mask air-purifying respirator with organic vapor cartridge.
(b) Less than or equal to 50 ppm.	(1) Full facepiece respirator with organic vapor cartridges.
(c) Less than or equal to 100 ppm.	(1) Full facepiece gas mask with chin style canister. ¹
(d) Less than or equal to 1,000 ppm.	(1) Full facepiece powered air-purifying respirator with organic vapor canister. ¹
(e) Greater than 1,000 ppm or unknown concentration.	(1) Supplied air respirator with full facepiece in positive-pressure mode.
(f) Escape.....	(1) Self-contained breathing apparatus with full facepiece in positive-pressure mode.
(g) Firefighting.....	(2) Full facepiece positive-pressure supplied-air respirator with auxiliary self-contained air supply.
(f) Escape.....	(1) Any organic-vapor gas mask; or
(g) Firefighting.....	(2) Any self-contained breathing apparatus with full facepiece.
(g) Firefighting.....	(1) Full facepiece self-contained breathing apparatus in positive pressure mode.

¹ Canisters must have a minimum service life of four (4) hours when tested at 150 ppm benzene, at a flow rate of 64 LPM, 25° C, and 85% relative humidity for non-powered air purifying respirators. The flow rate shall be 115 LPM and 170 LPM respectively for tight fitting and loose fitting powered air-purifying respirators.

(8) Protective clothing and equipment. Personal protective clothing and equipment shall be worn where appropriate to prevent eye contact and limit dermal exposure to liquid benzene. Protective clothing and equipment shall be provided by the employer at no cost to the employee and the employer shall assure its use where appropriate. Eye and face protection shall meet the requirements of WAC 296-24-07801.

(9) Medical surveillance.

(a) General.

(i) The employer shall make available a medical surveillance program for employees who are or may be exposed to benzene at or above the action level thirty or more days per year; for employees who are or may be exposed to benzene at or above the PELs ten or more days per year; for employees who have been exposed to more than 10 ppm of benzene for thirty or more days in a year prior to the effective date of the standard when employed by their current employer; and for employees involved in the tire building operations called tire building machine operators, who use solvents containing greater than 0.1 percent benzene.

(ii) The employer shall assure that all medical examinations and procedures are performed by or under the supervision of a licensed physician and that all laboratory tests are conducted by an accredited laboratory.

(iii) The employer shall assure that persons other than licensed physicians who administer the pulmonary function testing required by this section shall complete a training course in spirometry sponsored by an appropriate governmental, academic, or professional institution.

(iv) The employer shall assure that all examinations and procedures are provided without cost to the employee and at a reasonable time and place.

(b) Initial examination.

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

(A) A detailed occupational history which includes:

(I) Past work exposure to benzene or any other hematological toxins;

(II) A family history of blood dyscrasias including hematological neoplasms;

(III) A history of blood dyscrasias including genetic hemoglobin abnormalities, bleeding abnormalities, abnormal function of formed blood elements;

(IV) A history of renal or liver dysfunction;

(V) A history of medicinal drugs routinely taken;

(VI) A history of previous exposure to ionizing radiation; and

(VII) Exposure to marrow toxins outside of the current work situation.

(B) A complete physical examination.

(C) Laboratory tests. A complete blood count including a leukocyte count with differential, a quantitative thrombocyte count, hematocrit, hemoglobin, erythrocyte count and erythrocyte indices (MCV, MCH, MCHC). The results of these tests shall be reviewed by the examining physician.

(D) Additional tests as necessary in the opinion of the examining physician, based on alterations to the components of the blood or other signs which may be related to benzene exposure.

(E) For all workers required to wear respirators for at least thirty days a year, the physical examination shall pay special attention to the cardiopulmonary system and shall include a pulmonary function test.

(ii) No initial medical examination is required to satisfy the requirements of (b)(i) of this subsection if adequate records show that the employee has been examined in accordance with the procedures of (b)(i) of this subsection within the twelve months prior to the effective date of this standard.

(c) Periodic examinations.

(i) The employer shall provide each employee covered under (a)(i) of this subsection with a medical examination annually following the previous examination. These periodic examinations shall include at least the following elements:

(A) A brief history regarding any new exposure to potential marrow toxins, changes in medicinal drug use, and the appearance of physical signs relating to blood disorders;

(B) A complete blood count including a leukocyte count with differential, quantitative thrombocyte count, hemoglobin, hematocrit, erythrocyte count and erythrocyte indices (MCV, MCH, MCHC); and

(C) Appropriate additional tests as necessary, in the opinion of the examining physician, in consequence of

alterations in the components of the blood or other signs which may be related to benzene exposure.

(ii) Where the employee develops signs and symptoms commonly associated with toxic exposure to benzene, the employer shall provide the employee with an additional medical examination which shall include those elements considered appropriate by the examining physician.

(iii) For persons required to use respirators for at least thirty days a year, a pulmonary function test shall be performed every three years. A specific evaluation of the cardiopulmonary system shall be made at the time of the pulmonary function test.

(d) Emergency examinations.

(i) In addition to the surveillance required by (a)(i) of this subsection, if an employee is exposed to benzene in an emergency situation, the employer shall have the employee provide a urine sample at the end of the employee's shift and have a urinary phenol test performed on the sample within seventy-two hours. The urine specific gravity shall be corrected to 1.024.

(ii) If the result of the urinary phenol test is below 75 mg phenol/L of urine, no further testing is required.

(iii) If the result of the urinary phenol test is equal to or greater than 75 mg phenol/L of urine, the employer shall provide the employee with a complete blood count including an erythrocyte count, leukocyte count with differential and thrombocyte count at monthly intervals for a duration of three months following the emergency exposure.

(iv) If any of the conditions specified in (e)(i) of this subsection exists, then the further requirements of (e) of this subsection shall be met and the employer shall, in addition, provide the employees with periodic examinations if directed by the physician.

(e) Additional examinations and referrals.

(i) Where the results of the complete blood count required for the initial and periodic examinations indicate any of the following abnormal conditions exist, then the blood count shall be repeated within two weeks.

(A) The hemoglobin level or the hematocrit falls below the normal limit (outside the ninety-five percent confidence interval (C.I.)) as determined by the laboratory for the particular geographic area and/or these indices show a persistent downward trend from the individual's preexposure norms; provided these findings cannot be explained by other medical reasons.

(B) The thrombocyte (platelet) count varies more than twenty percent below the employee's most recent values or falls outside the normal limit (ninety-five percent C.I.) as determined by the laboratory.

(C) The leukocyte count is below 4,000 per mm³ or there is an abnormal differential count.

(ii) If the abnormality persists, the examining physician shall refer the employee to a hematologist or an internist for further evaluation unless the physician has good reason to believe such referral is unnecessary. (See Appendix C for examples of conditions where a referral may be unnecessary.)

(iii) The employer shall provide the hematologist or internist with the information required to be provided to the physician under this subsection and the medical

record required to be maintained by subsection (11)(b)(ii) of this section.

(iv) The hematologist's or internist's evaluation shall include a determination as to the need for additional tests, and the employer shall assure that these tests are provided.

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

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

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

(iii) The employee's actual or representative exposure level;

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

(v) Information from previous employment-related medical examinations of the affected employee which is not otherwise available to the examining physician.

(g) Physician's written opinions.

(i) For each examination under this section, the employer shall obtain and provide the employee with a copy of the examining physician's written opinion within fifteen days of the examination. The written opinion shall be limited to the following information:

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

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

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

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

(ii) The written opinion obtained by the employer shall not reveal specific records, findings, and diagnoses that have no bearing on the employee's ability to work in a benzene-exposed workplace.

(h) Medical removal plan.

(i) When a physician makes a referral to a hematologist/internist as required under (e)(ii) of this subsection, the employee shall be removed from areas where exposures may exceed the action level until such time as the physician makes a determination under (h)(ii) of this subsection.

(ii) Following the examination and evaluation by the hematologist/internist, a decision to remove an employee from areas where benzene exposure is above the action level or to allow the employee to return to areas where benzene exposure is above the action level shall be made by the physician in consultation with the hematologist/internist. This decision shall be communicated in writing to the employer and employee. In the case of removal, the physician shall state the required probable duration

of removal from occupational exposure to benzene above the action level and the requirements for future medical examinations to review the decision.

(iii) For any employee who is removed pursuant to (h)(ii) of this subsection, the employer shall provide a follow-up examination. The physician, in consultation with the hematologist/internist, shall make a decision within six months of the date the employee was removed as to whether the employee shall be returned to the usual job or whether the employee should be removed permanently.

(iv) Whenever an employee is temporarily removed from benzene exposure pursuant to (h)(i) or (ii) of this subsection, the employer shall transfer the employee to a comparable job for which the employee is qualified (or can be trained for in a short period) and where benzene exposures are as low as possible, but in no event higher than the action level. The employer shall maintain the employee's current wage rate, seniority, and other benefits. If there is no such job available, the employer shall provide medical removal protection benefits until such a job becomes available or for six months, whichever comes first.

(v) Whenever an employee is removed permanently from benzene exposure based on a physician's recommendation pursuant to (h)(iii) of this subsection, the employee shall be given the opportunity to transfer to another position which is available or later becomes available for which the employee is qualified (or can be trained for in a short period) and where benzene exposures are as low as possible but in no event higher than the action level. The employer shall assure that such employee suffers no reduction in current wage rate, seniority, or other benefits as a result of the transfer.

(i) Medical removal protection benefits.

(i) The employer shall provide to an employee six months of medical removal protection benefits immediately following each occasion an employee is removed from exposure to benzene because of hematological findings pursuant to (h)(i) and (ii) of this subsection, unless the employee has been transferred to a comparable job where benzene exposures are below the action level.

(ii) For the purposes of this section, the requirement that an employer provide medical removal protection benefits means that the employer shall maintain the current wage rate, seniority, and other benefits of an employee as though the employee had not been removed.

(iii) The employer's obligation to provide medical removal protection benefits to a removed employee shall be reduced to the extent that the employee receives compensation for earnings lost during the period of removal either from a publicly or employer-funded compensation program, or from employment with another employer made possible by virtue of the employee's removal.

(10) Communication of benzene hazards to employees.

(a) Signs and labels.

(i) The employer shall post signs at entrances to regulated areas. The signs shall bear the following legend:

DANGER
BENZENE
CANCER HAZARD
FLAMMABLE-NO SMOKING
AUTHORIZED PERSONNEL ONLY
RESPIRATOR REQUIRED

(ii) The employer shall ensure that labels or other appropriate forms of warning are provided for containers of benzene within the workplace. There is no requirement to label pipes. The labels shall comply with the requirements of WAC 296-62-05411 and in addition shall include the following legend:

DANGER
CONTAINS BENZENE
CANCER HAZARD

(b) Material safety data sheets.

(i) Employers shall obtain or develop, and shall provide access to their employees, to a material safety data sheet (MSDS) which addresses benzene and complies with WAC 296-62-054.

(ii) Employers who are manufacturers or importers shall:

(A) Comply with subsection (1) of this section; and

(B) Comply with the requirement in WISHA's hazard communication standard, WAC 296-62-054 (Hazard communication purpose), that they deliver to downstream employers an MSDS which addresses benzene.

(c) Information and training.

(i) The employer shall provide employees with information and training at the time of their initial assignment to a work area where benzene is present. If exposures are above the action level, employees shall be provided with information and training at least annually thereafter.

(ii) The training program shall be in accordance with the requirements of WAC 296-62-05415 (1) and (2), and shall include specific information on benzene for each category of information included in that section.

(iii) In addition to the information required under WAC 296-62-054, the employer shall:

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

(B) Describe the medical surveillance program required under subsection (9) of this section, and explain the information contained in Appendix C.

(11) Recordkeeping.

(a) Exposure measurements.

(i) The employer shall establish and maintain an accurate record of all measurements required by subsection (5) of this section, in accordance with WAC 296-62-052.

(ii) This record shall include:

(A) The dates, number, duration, and results of each of the samples taken, including a description of the procedure used to determine representative employee exposures;

(B) A description of the sampling and analytical methods used;

(C) A description of the type of respiratory protective devices worn, if any; and

(D) The name, Social Security number, job classification, and exposure levels of the employee monitored and all other employees whose exposure the measurement is intended to represent.

(iii) The employer shall maintain this record for at least the duration of employment plus thirty years, in accordance with Part B, Access to records, WAC 296-62-052 through 296-62-05223.

(b) Medical surveillance.

(i) The employer shall establish and maintain an accurate record for each employee subject to medical surveillance required by subsection (9) of this section, in accordance with WAC 296-62-052.

(ii) This record shall include:

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

(B) The employer's copy of the physician's written opinion on the initial, periodic, and special examinations, including results of medical examinations and all tests, opinions, and recommendations;

(C) Any employee medical complaints related to exposure to benzene;

(D) A copy of the information provided to the physician as required by subsection (9)(f)(ii) through (v) of this section; and

(E) A copy of the employee's medical and work history related to exposure to benzene or any other hematologic toxins.

(iii) The employer shall maintain this record for at least the duration of employment plus thirty years, in accordance with Part B, Access to records, WAC 296-62-052 through 296-62-05223.

(c) Availability.

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

(ii) Employee exposure monitoring records required by this subsection shall be provided upon request for examination and copying to employees, employee representatives, and the director in accordance with WAC 296-62-05201 through 296-62-05209 and 296-62-05213 through 296-62-05217.

(iii) Employee medical records required by this subsection shall be provided upon request for examination and copying, to the subject employee, to anyone having the specific written consent of the subject employee, and to the director in accordance with WAC 296-62-052.

(d) Transfer of records.

(i) The employer shall comply with the requirements involving transfer of records set forth in WAC 296-62-05205.

(ii) If the employer ceases to do business and there is no successor employer to receive and retain the records for the prescribed period, the employer shall notify the director, at least three months prior to disposal, and transmit them to the director if required by the director within that period.

(12) Observation of monitoring.

(a) Employee observation. The employer shall provide affected employees, or their designated representatives, an opportunity to observe the measuring or monitoring of employee exposure to benzene conducted pursuant to subsection (5) of this section.

(b) Observation procedures. When observation of the measuring or monitoring of employee exposure to benzene requires entry into areas where the use of protective clothing and equipment or respirators is required, the employer shall provide the observer with personal protective clothing and equipment or respirators required to be worn by employees working in the area, assure the use of such clothing and equipment or respirators, and require the observer to comply with all other applicable safety and health procedures.

(13) Dates.

(a) Engineering and work practice controls required by subsection (6)(a) of this section shall be implemented no later than December 10, 1989.

(b) Coke and coal chemical operations may comply with (b)(ii) of this subsection or alternately include within the compliance program required by subsection (6)(b) of this section, a requirement to phase in engineering controls as equipment is repaired and replaced. For coke and coal chemical operations choosing the latter alternative, compliance with the engineering controls requirements of subsection (6)(a) of this section shall be achieved no later than December 10, 1992. Substantial compliance with the engineering control requirements shall be achieved no later than December 10, 1990.

(14) Appendices. The information contained in WAC 296-62-07525, Appendices A, B, C, and D is not intended, by itself, to create any additional obligations not otherwise imposed or to detract from any existing obligations. The protocols on respiratory fit testing in Appendix E are mandatory.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-07523, filed 10/6/88, effective 11/7/88.]

WAC 296-62-07525 Appendix A substance safety data sheet--Benzene. (1) Substance identification.

(a) Substance: Benzene.

(b) Permissible exposure: Except as to the use of gasoline, motor fuels, and other fuels subsequent to discharge from bulk terminals and other exemptions specified in WAC 296-62-07523 (1)(b):

(i) Airborne: The maximum time-weighted average (TWA) exposure limit is one part of benzene vapor per million parts of air (1 ppm) for an eight-hour workday and the maximum short-term exposure limit (STEL) is 5 ppm for any fifteen-minute period.

(ii) Dermal: Eye contact shall be prevented and skin contact with liquid benzene shall be limited.

(c) Appearance and odor: Benzene is a clear, colorless liquid with a pleasant, sweet odor. The odor of benzene does not provide adequate warning of its hazard.

(2) Health hazard data.

(a) Ways in which benzene affects your health. Benzene can affect your health if you inhale it, or if it comes in contact with your skin or eyes. Benzene is also harmful if you happen to swallow it.

(b) Effects of overexposure.

(i) Short-term (acute) overexposure: If you are overexposed to high concentrations of benzene, well above the levels where its odor is first recognizable, you may feel breathless, irritable, euphoric, or giddy; you may experience irritation in eyes, nose, and respiratory tract. You may develop a headache, feel dizzy, nauseated, or intoxicated. Severe exposures may lead to convulsions and loss of consciousness.

(ii) Long-term (chronic) exposure. Repeated or prolonged exposure to benzene, even at relatively low concentrations, may result in various blood disorders, ranging from anemia to leukemia, an irreversible, fatal disease. Many blood disorders associated with benzene exposure may occur without symptoms.

(3) Protective clothing and equipment.

(a) Respirators. Respirators are required for those operations in which engineering controls or work practice controls are not feasible to reduce exposure to the permissible level. However, where employers can document that benzene is present in the workplace less than thirty days a year, respirators may be used in lieu of engineering controls. If respirators are worn, they must have joint Mine Safety and Health Administration and the National Institute for Occupational Safety and Health (NIOSH) seal of approval, and cartridge or canisters must be replaced before the end of their service life, or the end of the shift, whichever occurs first. If you experience difficulty breathing while wearing a respirator, you may request a positive pressure respirator from your employer. You must be thoroughly trained to use the assigned respirator, and the training will be provided by your employer.

(b) Protective clothing. You must wear appropriate protective clothing (such as boots, gloves, sleeves, aprons, etc.) over any parts of your body that could be exposed to liquid benzene.

(c) Eye and face protection. You must wear splash-proof safety goggles if it is possible that benzene may get into your eyes. In addition, you must wear a face shield if your face could be splashed with benzene liquid.

(4) Emergency and first aid procedures.

(a) Eye and face exposure. If benzene is splashed in your eyes, wash it out immediately with large amounts of water. If irritation persists or vision appears to be affected see a doctor as soon as possible.

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

(c) Breathing. If you or any other person breathes in large amounts of benzene, get the exposed person to

fresh air at once. Apply artificial respiration if breathing has stopped. Call for medical assistance or a doctor as soon as possible. Never enter any vessel or confined space where the benzene concentration might be high without proper safety equipment and at least one other person present who will stay outside. A life line should be used.

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

(5) Medical requirements. If you are exposed to benzene at a concentration at or above 0.5 ppm as an 8-hour time-weighted average, or have been exposed at or above 10 ppm in the past while employed by your current employer, your employer is required to provide a medical examination and history and laboratory tests within sixty days of the effective date of this standard and annually thereafter. These tests shall be provided without cost to you. In addition, if you are accidentally exposed to benzene (either by ingestion, inhalation, or skin/eye contact) under emergency conditions known or suspected to constitute toxic exposure to benzene, your employer is required to make special laboratory tests available to you.

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

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

(8) Precautions for safe use, handling, and storage. Benzene liquid is highly flammable. It should be stored in tightly closed containers in a cool, well ventilated area. Benzene vapor may form explosive mixtures in air. All sources of ignition must be controlled. Use non-sparking tools when opening or closing benzene containers. Fire extinguishers, where provided, must be readily available. Know where they are located and how to operate them. Smoking is prohibited in areas where benzene is used or stored. Ask your supervisor where benzene is used in your area and for additional plant safety rules.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-07525, filed 10/6/88, effective 11/7/88.]

WAC 296-62-07527 Appendix B substance technical guidelines—Benzene. (1) Physical and chemical data.

(a) Substance identification.

(i) Synonyms: Benzol, benzole, coal naphtha, cyclohexatriene, phene, phenyl hydride, pyrobenzol.

(Benzin, petroleum benzin and Benzine do not contain benzene.)

(ii) Formula: C₆H₆ (CAS Registry Number: 71-43-2).

(b) Physical data.

(i) Boiling point (760 mm Hg); 80.1 C (176 F).

(ii) Specific gravity (water=1): 0.879.

(iii) Vapor density (air=1): 2.7.

(iv) Melting point: 5.5 C (42 F).

(v) Vapor pressure at 20 C (68 F): 75 mm Hg.

(vi) Solubility in water: .06%.

(vii) Evaporation rate (ether=1): 2.8.

(viii) Appearance and odor: Clear, colorless liquid with a distinctive sweet odor.

(2) Fire, explosion, and reactivity hazard data.

(a) Fire.

(i) Flash point (closed cup): -11 C (12 F).

(ii) Autoignition temperature: 580 C (1076 F).

(iii) Flammable limits in Air. % by volume: Lower: 1.3%, Upper: 7.5%.

(iv) Extinguishing media: Carbon dioxide, dry chemical, or foam.

(v) Special fire-fighting procedures: Do not use solid stream of water, since stream will scatter and spread fire. Fine water spray can be used to keep fire-exposed containers cool.

(vi) Unusual fire and explosion hazards: Benzene is a flammable liquid. Its vapors can form explosive mixtures. All ignition sources must be controlled when benzene is used, handled, or stored. Where liquid or vapor may be released, such areas shall be considered as hazardous locations. Benzene vapors are heavier than air; thus the vapors may travel along the ground and be ignited by open flames or sparks at locations remote from the site at which benzene is handled.

(vii) Benzene is classified as a 1 B flammable liquid for the purpose of conforming to the requirements of WAC 296-24-330. A concentration exceeding 3,250 ppm is considered a potential fire explosion hazard. Locations where benzene may be present in quantities sufficient to produce explosive or ignitable mixtures are considered Class I Group D for the purposes of conforming to the requirements of WAC 296-24-95613.

(b) Reactivity.

(i) Conditions contributing to instability: Heat.

(ii) Incompatibility: Heat and oxidizing materials.

(iii) Hazardous decomposition products: Toxic gases and vapors (such as carbon monoxide).

(3) Spill and leak procedures.

(a) Steps to be taken if the material is released or spilled. As much benzene as possible should be absorbed with suitable materials, such as dry sand or earth; benzene remaining must be flushed with large amounts of water. Do not flush benzene into a confined space, such as a sewer, because of explosion danger. Remove all ignition sources. Ventilate enclosed places.

(b) Waste disposal method. Disposal methods must conform to other jurisdictional regulations. If allowed, benzene may be disposed of:

(i) By absorbing it in dry sand or earth and disposing in a sanitary landfill;

(ii) If small quantities, by removing it to a safe location from buildings or other combustible sources, pouring it in dry sand or earth and cautiously igniting it; and

(iii) If large quantities, by atomizing it in a suitable combustion chamber.

(4) Miscellaneous precautions.

(a) High exposure to benzene can occur when transferring the liquid from one container to another. Such operations should be well ventilated and good work practices must be established to avoid spills.

(b) Use nonsparking tools to open benzene containers which are effectively grounded and bonded prior to opening and pouring.

(c) Employers must advise employees of all plant areas and operations where exposure to benzene could occur. Common operations in which high exposures to benzene may be encountered are: The primary production and utilization of benzene, and transfer of benzene.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-07527, filed 10/6/88, effective 11/7/88.]

WAC 296-62-07529 Appendix C medical surveillance guidelines for benzene. (1) Route of entry.

Inhalation; skin absorption.

(2) Toxicology. Benzene is primarily an inhalation hazard. Systemic absorption may cause depression of the hematopoietic system, pancytopenia, aplastic anemia, and leukemia. Inhalation of high concentrations can affect central nervous system function. Aspiration of small amounts of liquid benzene immediately causes pulmonary edema and hemorrhage of pulmonary tissue. There is some absorption through the skin. Absorption may be more rapid in the case of abraded skin, and benzene may be more readily absorbed if it is present in a mixture or as a contaminant in solvents which are readily absorbed. The defatting action of benzene may produce primary irritation due to repeated or prolonged contact with the skin. High concentrations are irritating to the eyes and the mucous membranes of the nose, and respiratory tract.

(3) Signs and symptoms. Direct skin contact with benzene may cause erythema. Repeated or prolonged contact may result in drying, scaling dermatitis, or development of secondary skin infections. In addition, there is benzene absorption through the skin. Local effects of benzene vapor or liquid on the eye are slight. Only at very high concentrations is there any smarting sensation in the eye. Inhalation of high concentrations of benzene may have an initial stimulatory effect on the central nervous system characterized by exhilaration, nervous excitation, and/or giddiness, followed by a period of depression, drowsiness, or fatigue. A sensation of tightness in the chest accompanied by breathlessness may occur and ultimately the victim may lose consciousness. Tremors, convulsions, and death may follow from respiratory paralysis or circulatory collapse in a few minutes to several hours following severe exposures.

The detrimental effect on the blood-forming system of prolonged exposure to small quantities of benzene vapor is of extreme importance. The hematopoietic system is the chief target for benzene's toxic effects which are

manifested by alterations in the levels of formed elements in the peripheral blood. These effects have occurred at concentrations of benzene which may not cause irritation of mucous membranes, or any unpleasant sensory effects. Early signs and symptoms of benzene morbidity are varied, often not readily noticed and nonspecific. Subjective complaints of headache, dizziness, and loss of appetite may precede or follow clinical signs. Rapid pulse and low blood pressure, in addition to a physical appearance of anemia, may accompany a subjective complaint of shortness of breath and excessive tiredness. Bleeding from the nose, gums, or mucous membranes, and the development of purpuric spots (small bruises) may occur as the condition progresses. Clinical evidence of leukopenia, anemia, and thrombocytopenia, singly or in combination, has been frequently reported among the first signs.

Bone marrow may appear normal, aplastic, or hyperplastic, and may not, in all situations, correlate with peripheral blood forming tissues. Because of variations in the susceptibility to benzene morbidity, there is no "typical" blood picture. The onset of effects of prolonged benzene exposure may be delayed for many months or years after the actual exposure has ceased and identification or correlation with benzene exposure must be sought out in the occupational history.

(4) Treatment of acute toxic effects. Remove from exposure immediately. Make sure you are adequately protected and do not risk being overcome by fumes. Give oxygen or artificial resuscitation if indicated. Flush eyes, wash skin if contaminated and remove all contaminated clothing. Symptoms of intoxication may persist following severe exposures. Recovery from mild exposures is usually rapid and complete.

(5) Surveillance and preventive considerations.

(a) General. The principal effects of benzene exposure which form the basis for this regulation are pathological changes in the hematopoietic system, reflected by changes in the peripheral blood and manifesting clinically as pancytopenia, aplastic anemia, and leukemia. Consequently, the medical surveillance program is designed to observe, on a regular basis, blood indices for early signs of these effects, and although early signs of leukemia are not usually available, emerging diagnostic technology and innovative regimes make consistent surveillance for leukemia, as well as other hematopoietic effects, essential.

Initial examinations are to be provided within sixty days of the effective date of this standard, or at the time of initial assignment, and periodic examinations annually thereafter.

There are special provisions for medical tests in the event of hematologic abnormalities or for emergency situations.

The blood values which require referral to a hematologist or internist are noted in (b)(i) of this subsection. The standard specifies that blood abnormalities that persist must be referred "unless the physician has good reason to believe such referral is unnecessary" ((b)(i) of this subsection). Examples of conditions that could make a referral unnecessary despite abnormal blood limits are

iron or folate deficiency, menorrhagia, or blood loss due to some unrelated medical abnormality.

Symptoms and signs of benzene toxicity can be non-specific. Only a detailed history and appropriate investigative procedure will enable a physician to rule out or confirm conditions that place the employee at increased risk. To assist the examining physician with regard to which laboratory tests are necessary and when to refer an employee to the specialist, OSHA has established the following guidelines.

(b) Hematology guidelines. A minimum battery of tests is to be performed by strictly standardized methods.

(i) Red cell, white cell, platelet counts, white blood cell differential, hematocrit and red cell indices must be performed by an accredited laboratory. The normal ranges for the red cell and white cell counts are influenced by altitude, race, and sex, and therefore should be determined by the accredited laboratory in the specific area where the tests are performed.

Either a decline from an absolute normal or an individual's baseline to a subnormal value or a rise to a supra-normal value, are indicative of potential toxicity, particularly if all blood parameters decline. The normal total white blood count is approximately 7,200/mm³ plus or minus 3,000. For cigarette smokers the white count may be higher and the upper range may be 2,000 cells higher than normal for the laboratory. In addition, infection, allergies and some drugs may raise the white cell count. The normal platelet count is approximately 250,000 with a range of 140,000 to 400,000. Counts outside this range should be regarded as possible evidence of benzene toxicity.

Certain abnormalities found through routine screening are of greater significance in the benzene-exposed worker and require prompt consultation with a specialist, namely:

(A) Thrombocytopenia.

(B) A trend of decreasing white cell, red cell, or platelet indices in an individual over time is more worrisome than an isolated abnormal finding at one test time. The importance of trend highlights the need to compare an individual's test results to baseline and/or previous periodic tests.

(C) A constellation or pattern of abnormalities in the different blood indices is of more significance than a single abnormality. A low white count not associated with any abnormalities in other cell indices may be a normal statistical variation, whereas if the low white count is accompanied by decreases in the platelet and/or red cell indices, such a pattern is more likely to be associated with benzene toxicity and merits thorough investigation.

Anemia, leukopenia, macrocytosis or an abnormal differential white blood cell count should alert the physician to further investigate and/or refer the patient if repeat tests confirm the abnormalities. If routine screening detects an abnormality, follow-up tests which may be helpful in establishing the etiology of the abnormality are the peripheral blood smear and the reticulocyte count.

The extreme range of normal for reticulocytes is 0.4 to 2.5 percent of the red cells, the usual range being 0.5 to 1.2 percent of the red cells, but the typical value is in the range of 0.8 to 1.0 percent. A decline in reticulocytes to levels of less than 0.4 percent is to be regarded as possible evidence (unless another specific cause is found) of benzene toxicity requiring accelerated surveillance. An increase in reticulocyte levels to about 2.5 percent may also be consistent with (but is not as characteristic of) benzene toxicity.

(ii) An important diagnostic test is a careful examination of the peripheral blood smear. As with reticulocyte count the smear should be with fresh uncoagulated blood obtained from a needle tip following venipuncture or from a drop of earlobe blood (capillary blood). If necessary, the smear may, under certain limited conditions, be made from a blood sample anticoagulated with EDTA (but never with oxalate or heparin). When the smear is to be prepared from a specimen of venous blood which has been collected by a commercial Vacutainer type tube containing neutral EDTA, the smear should be made as soon as possible after the venesection. A delay of up to twelve hours is permissible between the drawing of the blood specimen into EDTA and the preparation of the smear if the blood is stored at refrigerator (not freezing) temperature.

(iii) The minimum mandatory observations to be made from the smear are:

(A) The differential white blood cell count;

(B) Description of abnormalities in the appearance of red cells; and

(C) Description of any abnormalities in the platelets.

(D) A careful search must be made throughout of every blood smear for immature white cells such as band forms (in more than normal proportion, i.e., over ten percent of the total differential count), any number of metamyelocytes, myelocytes, or myeloblasts. Any nucleate or multinucleated red blood cells should be reported. Large "giant" platelets or fragments of megakaryocytes must be recognized.

An increase in the proportion of band forms among the neutrophilic granulocytes is an abnormality deserving special mention, for it may represent a change which should be considered as an early warning of benzene toxicity in the absence of other causative factors (most commonly infection). Likewise, the appearance of metamyelocytes, in the absence of another probable cause, is to be considered a possible indication of benzene-induced toxicity.

An upward trend in the number of basophils, which normally do not exceed about 2.0 percent of the total white cells, is to be regarded as possible evidence of benzene toxicity. A rise in the eosinophil count is less specific but also may be suspicious of toxicity if it rises above 6.0 percent of the total white count.

The normal range of monocytes is from 2.0 to 8.0 percent of the total white count with an average of about 5.0 percent. About twenty percent of individuals reported to have mild but persisting abnormalities caused by exposure to benzene show a persistent monocytosis. The findings of a monocyte count which persists at more

than ten to twelve percent of the normal white cell count (when the total count is normal) or persistence of an absolute monocyte count in excess of 800/mm³ should be regarded as a possible sign of benzene-induced toxicity.

A less frequent but more serious indication of benzene toxicity is the finding in the peripheral blood of the so-called "pseudo" (or acquired) Pelger-Huet anomaly. In this anomaly many, or sometimes the majority, of the neutrophilic granulocytes possess two round nuclear segments—less often one or three round segments—rather than three normally elongated segments. When this anomaly is not hereditary, it is often but not invariably predictive of subsequent leukemia. However, only about two percent of patients who ultimately develop acute myelogenous leukemia show the acquired Pelger-Huet anomaly. Other tests that can be administered to investigate blood abnormalities are discussed below; however, such procedures should be undertaken by the hematologist.

An uncommon sign, which cannot be detected from the smear, but can be elicited by a "sucrose water test" of peripheral blood, is transient paroxysmal nocturnal hemoglobinuria (PNH), which may first occur insidiously during a period of established aplastic anemia, and may be followed within one to a few years by the appearance of rapidly fatal acute myelogenous leukemia. Clinical detection of PNH, which occurs in only one or two percent of those destined to have acute myelogenous leukemia, may be difficult; if the "sucrose water test" is positive, the somewhat more definitive Ham test, also known as the acid-serum hemolysis test, may provide confirmation.

(E) Individuals documented to have developed acute myelogenous leukemia years after initial exposure to benzene may have progressed through a preliminary phase of hematologic abnormality. In some instances pancytopenia (i.e., a lowering in the counts of all circulating blood cells of bone marrow origin, but not to the extent implied by the term "aplastic anemia") preceded leukemia for many years. Depression of a single blood cell type or platelets may represent a harbinger of aplasia or leukemia. The finding of two or more cytopenias, or pancytopenia in a benzene-exposed individual, must be regarded as highly suspicious of more advanced although still reversible, toxicity. "Pancytopenia" coupled with the appearance of immature cells (myelocytes, myeloblasts, erythroblasts, etc.), with abnormal cells (pseudo Pelger-Huet anomaly, atypical nuclear heterochromatin, etc.), or unexplained elevations of white blood cells must be regarded as evidence of benzene overexposure unless proved otherwise. Many severely aplastic patients manifested the ominous finding of five to ten percent myeloblasts in the marrow, occasional myeloblasts and myelocytes in the blood and twenty to thirty monocytes. It is evident that isolated cytopenias, pancytopenias, and even aplastic anemias induced by benzene may be reversible and complete recovery has been reported on cessation of exposure. However, since any of these abnormalities is serious, the

employee must immediately be removed from any possible exposure to benzene vapor. Certain tests may substantiate the employee's prospects for progression or regression. One such test would be an examination of the bone marrow, but the decision to perform a bone marrow aspiration or needle biopsy is made by the hematologist.

The findings of basophilic stippling in circulating red blood cells (usually found in one to five percent of red cells following marrow injury), and detection in the bone marrow of what are termed "ringed sideroblasts" must be taken seriously, as they have been noted in recent years to be premonitory signs of subsequent leukemia.

Recently peroxidase-staining of circulating or marrow neutrophil granulocytes, employing benzidine dihydrochloride, have revealed the disappearance of, or diminution in, peroxidase in a sizable proportion of the granulocytes, and this has been reported as an early sign of leukemia. However, relatively few patients have been studied to date. Granulocyte granules are normally strongly peroxidase positive. A steady decline in leukocyte alkaline phosphatase has also been reported as suggestive of early acute leukemia. Exposure to benzene may cause an early rise in serum iron, often but not always associated with a fall in the reticulocyte count. Thus, serial measurements of serum iron levels may provide a means of determining whether or not there is a trend representing sustained suppression of erythropoiesis.

Measurement of serum iron, determination of peroxidase and of alkaline phosphatase activity in peripheral granulocytes can be performed in most pathology laboratories. Peroxidase and alkaline phosphatase staining are usually undertaken when the index of suspicion for leukemia is high.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-07529, filed 10/6/88, effective 11/7/88.]

WAC 296-62-07531 Appendix D sampling and analytical methods for benzene monitoring and measurement procedures. Measurements taken for the purpose of determining employee exposure to benzene are best taken so that the representative average eight-hour exposure may be determined from a single eight-hour sample or two four-hour samples. Short-time interval samples (or grab samples) may also be used to determine average exposure level if a minimum of five measurements are taken in a random manner over the eight-hour work shift. Random sampling means that any portion of the work shift has the same chance of being sampled as any other. The arithmetic average of all such random samples taken on one work shift is an estimate of an employee's average level of exposure for that work shift. Air samples should be taken in the employee's breathing zone (air that would most nearly represent that inhaled by the employee). Sampling and analysis must be performed with procedures meeting the requirements of the standard.

There are a number of methods available for monitoring employee exposures to benzene. The sampling and analysis may be performed by collection of the benzene

vapor on charcoal adsorption tubes, with subsequent chemical analysis by gas chromatography. Sampling and analysis may also be performed by portable direct reading instruments, real-time continuous monitoring systems, passive dosimeters or other suitable methods. The employer has the obligation of selecting a monitoring method which meets the accuracy and precision requirements of the standard under his unique field conditions. The standard requires that the method of monitoring must have an accuracy, to a ninety-five percent confidence level, of not less than plus or minus twenty-five percent for concentrations of benzene greater than or equal to 0.5 ppm.

The WISHA laboratory uses NIOSH Method 1500 for evaluation of benzene air concentrations.

(1) WISHA method HYDCB for air samples.

Analyte: Benzene.

Matrix: Air.

Procedure: Adsorption on charcoal, desorption with carbon disulfide, analysis by GC.

Detection limit: 0.25 ppm.

Recommended air volume and sampling rate: 10L at 0.05 to 0.2 L/min.

(a) Principle of the method.

(i) A known volume of air is drawn through a charcoal tube to trap the organic vapors present.

(ii) The charcoal in the tube is transferred to a small, stoppered vial, and the analyte is desorbed with carbon disulfide.

(iii) An aliquot of the desorbed sample is injected into a gas chromatograph.

(iv) The area of the resulting peak is determined and compared with areas obtained from standards.

(b) Advantages and disadvantages of the method.

(i) The sampling device is small, portable, and involves no liquids. Interferences are minimal, and most of those which do occur can be eliminated by altering chromatographic conditions. The samples are analyzed by means of a quick, instrumental method.

(ii) The amount of sample which can be taken is limited by the number of milligrams that the tube will hold before overloading. When the sample value obtained for the backup section of the charcoal tube exceeds twenty-five percent of that found on the front section, the possibility of sample loss exists.

(c) Apparatus.

(i) A calibrated personal sampling pump whose flow can be determined within ± 5 percent at the recommended flow rate.

(ii) Charcoal tubes: Glass with both ends flame sealed, 7 cm long with a 6-mm O.D. and a 4-mm I.D., containing two sections of 20/40 mesh activated charcoal separated by a 2-mm portion of urethane foam. The activated charcoal is prepared from coconut shells and is obtained commercially. The adsorbing section contains 100 mg of charcoal, the back-up section 50 mg. A 3-mm portion of urethane foam is placed between the outlet end of the tube and the back-up section. A plug of silanized glass wool is placed in front of the adsorbing section. The pressure drop across the tube must be less

than one inch of mercury at a flow rate of one liter per minute.

(iii) Gas chromatograph equipped with a flame ionization detector.

(iv) Column (10-ft 1/8-in stainless steel) packed with 80/100 Supelcoport coated with twenty percent SP 2100, 0.1 percent CW 1500.

(v) An electronic integrator or some other suitable method for measuring peak area.

(vi) Two-milliliter sample vials with Teflon-lined caps.

(vii) Microliter syringes: 10-microliter 10-uL syringe, and other convenient sizes for making standards, 1-uL syringe for sample injections.

(viii) Pipets: 1.0 mL delivery pipets.

(ix) Volumetric flasks: Convenient sizes for making standard solutions.

(d) Reagents.

(i) Chromatographic quality carbon disulfide (CS₂). Most commercially available carbon disulfide contains a trace of benzene which must be removed. It can be removed with the following procedure:

Heat under reflux for two to three hours, 500 mL of carbon disulfide, 10 mL concentrated sulfuric acid, and five drops of concentrated nitric acid. The benzene is converted to nitrobenzene. The carbon disulfide layer is removed, dried with anhydrous sodium sulfate, and distilled. The recovered carbon disulfide should be benzene free. (It has recently been determined that benzene can also be removed by passing the carbon disulfide through 13x molecular sieve.)

(ii) Benzene, reagent grade.

(iii) p-Cymene, reagent grade, (internal standard).

(iv) Desorbing reagent. The desorbing reagent is prepared by adding 0.05 mL of p-Cymene per milliliter of carbon disulfide. (The internal standard offers a convenient means correcting analytical response for slight inconsistencies in the size of sample injections. If the external standard technique is preferred, the internal standard can be eliminated.)

(v) Purified GC grade helium, hydrogen, and air.

(e) Procedure.

(i) Cleaning of equipment. All glassware used for the laboratory analysis should be properly cleaned and free of organics which could interfere in the analysis.

(ii) Calibration of personal pumps. Each pump must be calibrated with a representative charcoal tube in the line.

(iii) Collection and shipping of samples.

(A) Immediately before sampling, break the ends of the tube to provide an opening at least one-half the internal diameter of the tube (2 mm).

(B) The smaller section of the charcoal is used as the backup and should be placed nearest the sampling pump.

(C) The charcoal tube should be placed in a vertical position during sampling to minimize channeling through the charcoal.

(D) Air being sampled should not be passed through any hose or tubing before entering the charcoal tube.

(E) A sample size of ten liters is recommended. Sample at a flow rate of approximately 0.05 to 0.2 liters per

minute. The flow rate should be known with an accuracy of at least ± 5 percent.

(F) The charcoal tubes should be capped with the supplied plastic caps immediately after sampling.

(G) Submit at least one blank tube (a charcoal tube subjected to the same handling procedures, without having any air drawn through it) with each set of samples. Take necessary shipping and packing precautions to minimize breakage of samples.

(iv) Analysis of samples.

(A) Preparation of samples. In preparation for analysis, each charcoal tube is scored with a file in front of the first section of charcoal and broken open. The glass wool is removed and discarded. The charcoal in the first (larger) section is transferred to a 2-ml vial. The separating section of foam is removed and discarded; the second section is transferred to another capped vial. These two sections are analyzed separately.

(B) Desorption of samples. Prior to analysis, 1.0 mL of desorbing solution is pipetted into each sample container. The desorbing solution consists of 0.05 uL internal standard per mL of carbon disulfide. The sample vials are capped as soon as the solvent is added. Desorption should be done for thirty minutes with occasional shaking.

(C) GC conditions. Typical operating conditions for the gas chromatograph are:

- (I) mL/min (60 psig) helium carrier gas flow.
- (II) mL/min (40 psig) hydrogen gas flow to detector.
- (III) mL/min (40 psig) air flow to detector.
- (IV) 250°C injector temperature.
- (V) 250°C detector temperature.
- (VI) Column temperature variable.
- (D) Injection size. 1 µL.

(D) Measurement of area. The peak areas are measured by an electronic integrator or some other suitable form of area measurement.

(F) An internal standard procedure is used. The integrator is calibrated to report results in ppm for a ten liter air sample after correction for desorption efficiency.

(v) Determination of desorption efficiency.

(A) Importance of determination. The desorption efficiency of a particular compound can vary from one laboratory to another and from one lot of chemical to another. Thus, it is necessary to determine, at least once, the percentage of the specific compound that is removed in the desorption process, provided the same batch of charcoal is used.

(B) Procedure for determining desorption efficiency. The reference portion of the charcoal tube is removed. To the remaining portion, amounts representing 0.5X, 1X, and 2X and (X represents target concentration) based on a 10 L air sample are injected into several tubes at each level. Dilutions of benzene with carbon disulfide are made to allow injection of measurable quantities. These tubes are then allowed to equilibrate at least overnight. Following equilibration they are analyzed following the same procedure as the samples. Desorption efficiency is determined by dividing the amount of benzene found by amount spiked on the tube.

(f) Calibration and standards. A series of standards varying in concentration over the range of interest is prepared and analyzed under the same GC conditions that will be used on the samples. A calibration curve is prepared by plotting concentration (mg/mL) versus peak area.

(g) Calculations. Benzene air concentration can be calculated from the following equation:

$$\text{mg/m}^3 = (A)(B)/(C)(D)$$

Where: A=mg/mL benzene, obtained from the calibration curve

B=desorption volume (1 mL)

C=Liters of air sampled

D=desorption efficiency

The concentration in mg/m³ can be converted to ppm (at 25 and 760 mm) with the following equation:

$$\text{ppm} = (\text{mg/m}^3)(24.46)/(78.11)$$

Where: 24.46=molar volume of an ideal gas 25 C and 760 mm

78.11=molecular weight of benzene

(h) Backup data.

(i) Detection limit—air samples.

The detection limit for the analytical procedure is 2.2 mg with a coefficient of variation of 0.023 at this level. This would be equivalent to an air concentration of 0.25 ppm for a 10 L air sample. This amount provided a chromatographic peak that could be identifiable in the presence of possible interferences. The detection limit data were obtained by making 1 uL injections of a 2.2 mg/mL standard.

Injection	Area Count	
1	655.4	$\bar{X} = 640.2$ $SD = 14.9$ $CV = 0.023$
2	617.5	
3	662.0	
4	641.1	
5	636.4	
6	629.2	

(ii) Pooled coefficient of variation—Air Samples. The pooled coefficient of variation for the analytical procedure was determined by 1 uL replicate injections of analytical standards. The standards were 16.04, 32.08, and 64.16 ug/mL, which are equivalent to 0.5, 1.0, and 2.0 ppm for a 10 L air sample respectively.

Injection	Area Counts		
	0.5 ppm	1.0 ppm	2.0 ppm
1	3996.5	8130.2	16481
2	4059.4	8235.6	16493
3	4052.0	8307.9	16535
4	4027.2	8263.2	16609
5	4046.8	8291.1	16552
6	4137.9	8288.8	16618
$\bar{X} =$	4053.3	8254.0	16548.3
SD=	47.2	62.5	57.1
CV=	0.0116	0.0076	0.0034
CV= 0.008.....			

(iii) Storage data—air samples.

Samples were generated at 1.03 ppm benzene at eighty percent relative humidity, 22 C, and 643 mm. All samples were taken for fifty minutes at 0.2 L/min. Six samples were analyzed immediately and the rest of the samples were divided into two groups by fifteen samples each. One group was stored at refrigerated temperature of -25 C, and the other group was stored at ambient temperature (approximately 23 C). These samples were analyzed over a period of fifteen days. The results are tabulated below.

PERCENT RECOVERY

Day Analyzed	Refrigerated			Ambient		
	0	97.4	98.7	98.9	97.4	98.7
0	97.1	100.6	100.9*	97.1	100.6	100.9
2	95.8	96.4	95.4	95.4	96.6	96.9
5	93.9	93.7	92.4	92.4	94.3	94.1
9	93.6	95.5	94.6	95.2	95.6	96.6
13	94.3	95.3	93.7	91.0	95.0	94.6
15	96.8	95.8	94.2	92.9	96.3	95.9

(iv) Desorption data.

Samples were prepared by injecting liquid benzene onto the A section of charcoal tubes. Samples were prepared that would be equivalent to 0.5, 1.0, and 2.0 ppm for a 10 L air sample.

PERCENT RECOVERY

Sample	PERCENT RECOVERY		
	0.5 ppm	1.0 ppm	2.0 ppm
1	99.4	98.8	99.5
2	99.5	98.7	99.7
3	99.2	98.6	99.8
4	99.4	99.1	100.0
5	99.2	99.0	99.7
6	99.8	99.1	99.9
\bar{X} =	99.4	98.9	99.8
SD=	0.22	0.21	0.18
CV=	0.0022	0.0021	0.0018
\bar{X} = 99.4			

(v) Carbon disulfide.

Carbon disulfide from a number of sources was analyzed for benzene contamination. The results are given in the following table. The benzene contaminant can be removed with the procedures given in section 4.1.

SAMPLE	ug Benzene/mL	ppm equivalent (for 10 L air sample)
Aldrich Lot 83017.....	4.20	0.13
Baker Lot 720364.....	1.0†	0.03
Baker Lot 822351.....	1.0†	0.03
Malinkrodt Lot WEMP.....	1.74	0.05
Malinkrodt Lot WHGA.....	5.65	0.18
Treated CS ₂	2.90	0.09

(2) WISHA laboratory method for bulk samples.

Analyte: Benzene.

Matrix: Bulk samples.

Procedure: Bulk samples are analyzed directly by high performance liquid chromatography (HPLC) or by capillary gas chromatography. See laboratory manual for GC procedure.

Detection limits: 0.01% by volume.

(a) Principle of the method.

(i) An aliquot of the bulk sample to be analyzed is injected into a liquid chromatograph or gas chromatograph.

(ii) The peak area for benzene is determined and compared to areas obtained from standards.

(b) Advantages and disadvantages of the method.

(i) The analytical procedure is quick, sensitive, and reproducible.

(ii) Reanalysis of samples is possible.

(iii) Interferences can be circumvented by proper selection of HPLC parameters or GC parameters.

(iv) Samples must be free of any particulates that may clog the capillary tubing in the liquid chromatograph. This may require distilling the sample or clarifying with a clarification kit.

(c) Apparatus.

(i) Liquid chromatograph equipped with a UV detector or capillary gas chromatograph with FID detector.

(ii) HPLC column that will separate benzene from other components in the bulk sample being analyzed. The column used for validation studies was a Waters uBondapack C18, 30 cm x 3.9 mm.

(iii) A clarification kit to remove any particulates in the bulk if necessary.

(iv) A micro-distillation apparatus to distill any samples if necessary.

(v) An electronic integrator or some other suitable method of measuring peak areas.

(vi) Microliter syringes—10 uL syringe and other convenient sizes for making standards. 10 uL syringe for sample injections.

(vii) Volumetric flasks, 5 mL and other convenient sizes for preparing standards and making dilutions.

(d) Reagents.

(i) Benzene, reagent grade.

(ii) HPLC grade water, methyl alcohol, and isopropyl alcohol.

(e) Collection and shipment of samples.

(i) Samples should be transported in glass containers with Teflon-lined caps.

(ii) Samples should not be put in the same container used for air samples.

(f) Analysis of samples.

(i) Sample preparation.

If necessary, the samples are distilled or clarified. Samples are analyzed undiluted. If the benzene concentration is out of the working range, suitable dilutions are made with isopropyl alcohol.

(ii) HPLC conditions.

The typical operating conditions for the high performance liquid chromatograph are:

(A) Mobile phase—Methyl alcohol/water, 50/50.

(B) Analytical wavelength—254 nm.

(C) Injection size—10 μ L.

(iii) Measurement of peak area and calibration.

Peak areas are measured by an integrator or other suitable means. The integrator is calibrated to report results % in benzene by volume.

(g) Calculations.

Since the integrator is programmed to report results in % benzene by volume in an undiluted sample, the following equation is used:

$$\% \text{ Benzene by Volume} = A \times B$$

Where: A = % by volume on report

B = Dilution Factor

(B = 1 for undiluted sample)

(h) Backup data.

(i) Detection limit—bulk samples.

The detection limit for the analytical procedure for bulk samples is 0.88 ug, with a coefficient of variation of 0.019 at this level. This amount provided a chromatographic peak that could be identifiable in the presence of possible interferences. The detection limit data were obtained by making 10 uL injections of a 0.10% by volume standard.

1	45386	\bar{x} = 44040.1 SD = 852.5 CV = 0.019
2	44214	
3	43822	
4	44062	
5	44006	
6	42724	

(ii) Pooled coefficient of variation—bulk samples.

The pooled coefficient of variation for analytical procedure was determined by 50 uL replicate injections of analytical standards. The standards were 0.01, 0.02, 0.04, 0.10, 1.0, and 2.0% benzene by volume.

Injection No.	0.01	0.02	0.04	0.10	1.0	2.0
1	45386	84737	166097	448497	4395380	9339150
2	44241	84300	170832	441299	4590800	9484900
3	43822	83835	164160	443719	4593200	9557580
4	44062	84381	164445	444842	4642350	9677060
5	44006	83012	168398	442564	4646430	9766240
6	42724	81957	173002	443975	4646260	9766240
\bar{x} =	44040.1	83703.6	167872	444149	4585767	9564986
SD=	852.5	1042.2	3589.8	2459.1	96839.3	166233
CV=	0.0194	0.0125	0.0213	0.0055	0.0211	0.0174
\bar{CV} =	0.017					

selection shall include at least three sizes of elastomeric facepieces of the type of respirator that is to be tested, i.e., three sizes of half mask; or three sizes of full facepiece; and units from at least two manufacturers.

(b) Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine a comfortable fit. A mirror shall be available to assist the subject in evaluating the fit and positioning the respirator. This instruction may not constitute the subject's formal training on respirator use, as it is only a review.

(c) The test subject shall be informed that he/she is being asked to select the respirator which provides the most comfortable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.

(d) The test subject shall be instructed to hold each facepiece up to the face and eliminate those which obviously do not give a comfortable fit.

(e) The more comfortable facepieces are noted; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in (f) of this subsection. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.

(f) Assessment of comfort shall include reviewing the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator:

- (i) Position of the mask on the nose;
- (ii) Room for eye protection;
- (iii) Room to talk; and
- (iv) Position of mask on face and cheeks.

(g) The following criteria shall be used to help determine the adequacy of the respirator fit:

- (i) Chin properly placed;
- (ii) Adequate strap tension, not overly tightened;
- (iii) Fit across nose bridge;
- (iv) Respirator of proper size to span distance from nose to chin;
- (v) Tendency of respirator to slip; and
- (vi) Self-observation in mirror to evaluate fit and respirator position.

(h) The test subject shall conduct the negative and positive pressure fit checks as described below or ANSI Z88.2-1980. Before conducting the negative or positive pressure test, the subject shall be told to seat the mask on the face by moving the head from side-to-side and up and down slowly while taking in a few slow deep breaths. Another facepiece shall be selected and retested if the test subject fails the fit check tests.

(i) Positive pressure test. Close off the exhalation valve and exhale gently onto the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first

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WAC 296-62-07533 Appendix E qualitative and quantitative fit testing procedures. Fit test protocols.

(1) The employer shall include the following provisions in the fit test procedures. These provisions apply to both qualitative fit testing (QLFT) and quantitative fit testing (QNFT).

(a) The test subject shall be allowed to pick the most comfortable respirator from a selection including respirators of various sizes from different manufacturers. The

remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

(ii) Negative pressure test. Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

(i) The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, or long sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.

(j) If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician trained in respiratory disease or pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his duties.

(k) The test subject shall be given the opportunity to wear the successfully fitted respirator for a period of two weeks. If at any time during this period the respirator becomes uncomfortable, the test subject shall be given the opportunity to select a different facepiece and to be retested.

(l) The employer shall certify that a successful fit test has been administered to the employee. The certification shall include the following information:

- (i) Name of employee;
- (ii) Type, brand, and size of respirator; and
- (iii) Date of test.

Where QNFT is used, the fit factor, strip chart, or other recording of the results of the test, shall be retained with the certification. The certification shall be maintained until the next fit test is administered.

(m) Exercise regimen. Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure. The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worn for at least five minutes before the start of the fit test.

(n) Test exercises. The test subject shall perform exercises, in the test environment, in the manner described below:

(i) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally.

(ii) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as to not hyperventilate.

(iii) Turning head side to side. Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.

(iv) Moving head up and down. Standing in place, the subject shall slowly move his/her head up and down.

The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).

(v) Talking. The subject shall talk out loud slowly and loud enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from one hundred, or recite a memorized poem or song.

(vi) Grimace. The test subject shall grimace by smiling or frowning.

(vii) Bending over. The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud type QNFT units which prohibit bending at the waist.

(viii) Normal breathing. Same as exercise in (n)(i) of this subsection.

Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for fifteen seconds.

The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become uncomfortable, another model of respirator shall be tried.

(2) Qualitative fit test (QLFT) protocols.

(a) General.

(i) The employer shall assign specific individuals who shall assume full responsibility for implementing the respirator qualitative fit test program.

(ii) The employer shall ensure that persons administering QLFT are able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid tests, and assure that test equipment is in proper working order.

(iii) The employer shall assure that QLFT equipment is kept clean and well maintained so as to operate at the parameters for which it was designed.

(b) Isoamyl acetate protocol.

(i) Odor threshold screening.

The odor threshold screening test, performed without wearing a respirator, is intended to determine if the individual tested can detect the odor of isoamyl acetate.

(A) Three one-liter glass jars with metal lids are required.

(B) Odor free water (e.g., distilled or spring water) at approximately twenty-five degrees C shall be used for the solutions.

(C) The isoamyl acetate (IAA) (also known as isopentyl acetate) stock solution is prepared by adding 1 cc of pure IAA to 800 cc of odor free water in a one liter jar and shaking for thirty seconds. A new solution shall be prepared at least weekly.

(D) The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well ventilated but shall not be connected to the same recirculating ventilation system.

(E) The odor test solution is prepared in a second jar by placing 0.4 cc of the stock solution into 500 cc of odor free water using a clean dropper or pipette. The solution shall be shaken for thirty seconds and allowed

to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution shall be used for only one day.

(F) A test blank shall be prepared in a third jar by adding 500 cc of odor free water.

(G) The odor test and test blank jars shall be labeled 1 and 2 for jar identification. Labels shall be placed on the lids so they can be periodically peeled, dried off, and switched to maintain the integrity of the test.

(H) The following instruction shall be typed on a card and placed on the table in front of the two test jars (i.e., 1 and 2): "The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil."

(I) The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.

(J) If the test subject is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test shall not be performed.

(K) If the test subject correctly identifies the jar containing the odor test solution, the test subject may proceed to respirator selection and fit testing.

(ii) Isoamyl acetate fit test.

(A) The fit test chamber shall be similar to a clear fifty-five gallon drum liner suspended inverted over a two-foot diameter frame so that the top of the chamber is about six inches above the test subject's head. The inside top center of the chamber shall have a small hook attached.

(B) Each respirator used for the fitting and fit testing shall be equipped with organic vapor cartridges or offer protection against organic vapors. The cartridges or masks shall be changed at least weekly.

(C) After selecting, donning, and properly adjusting a respirator, the test subject shall wear it to the fit testing room. This room shall be separate from the room used for odor threshold screening and respirator selection, and shall be well ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.

(D) A copy of the test exercises and any prepared text from which the subject is to read shall be taped to the inside of the test chamber.

(E) Upon entering the test chamber, the test subject shall be given a six-inch by five-inch piece of paper towel, or other porous, absorbent, single-ply material, folded in half and wetted with 0.75 cc of pure IAA. The test subject shall hand the wet towel on the hook at the top of the chamber.

(F) Allow two minutes for the IAA test concentration to stabilize before starting the fit test exercises. This would be an appropriate time to talk with the test subject; to explain the fit test, the importance of his/her cooperation, and the purpose for the head exercises; or to demonstrate some of the exercises.

(G) If at any time during the test, the subject detects the banana like odor of IAA, the test has failed. The subject shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.

(H) If the test has failed, the subject shall return to the selection room and remove the respirator, repeat the odor sensitivity test, select and put on another respirator, return to the test chamber and again begin the procedure described in (b)(ii)(A) through (G) of this subsection. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the subject shall wait about five minutes before retesting. Odor sensitivity will usually have returned by this time.

(I) When a respirator is found that passes the test, its efficiency shall be demonstrated for the subject by having the subject break the face seal and take a breath before exiting the chamber.

(J) When the test subject leaves the chamber, the subject shall remove the saturated towel and return it to the person conducting the test. To keep the test area from becoming contaminated, the used towels shall be kept in a self sealing bag so there is no significant IAA concentration build-up in the test chamber during subsequent tests.

(c) Saccharin solution aerosol protocol. The saccharin solution aerosol QLFT protocol is the only currently available, validated test protocol for use with particulate disposable dust respirators not equipped with high-efficiency filters. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(i) Taste threshold screening. The saccharin taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of saccharin.

(A) Threshold screening as well as fit testing subjects shall wear an enclosure about the head and shoulders that is approximately twelve inches in diameter by fourteen inches tall with at least the front portion clear and that allows free movements of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts NZ FT 14 and NZ FT 15 combined, is adequate.

(B) The test enclosure shall have a three-quarter inch hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

(C) The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his/her wide open mouth with tongue extended.

(D) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer the test conductor shall spray the threshold check solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

(E) The threshold check solution consists of 0.83 grams of sodium saccharin USP in 1 cc of warm water. It can be prepared by putting 1 cc of the fit test solution (see (b)(ii)(E) of this subsection) in 100 cc of distilled water.

(F) To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then released and allowed to fully expand.

(G) Ten squeezes are repeated rapidly and then the test subject is asked whether the saccharin can be tasted.

(H) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted.

(I) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted.

(J) The test conductor will take note of the number of squeezes required to solicit a taste response.

(K) If the saccharin is not tasted after thirty squeezes (subitem (J)), the test subject may not perform the saccharin fit test.

(L) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

(M) Correct use of the nebulizer means that approximately 1 cc of liquid is used at a time in the nebulizer body.

(N) The nebulizer shall be thoroughly rinsed in water, shaken dry, and refilled at least each morning and afternoon or at least every four hours.

(ii) Saccharin solution aerosol fit test procedure.

(A) The test subject may not eat, drink (except plain water), or chew gum for fifteen minutes before the test.

(B) The fit test uses the same enclosure described in (c)(i) of this subsection.

(C) The test subject shall don the enclosure while wearing the respirator selected in (c)(i) of this subsection. The respirator shall be properly adjusted and equipped with a particulate filter(s).

(D) A second DeVilbiss Model 40 Inhalation Medication Nebulizer is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

(E) The fit test solution is prepared by adding eighty-three grams of sodium saccharin to 100 cc of warm water.

(F) As before, the test subject shall breathe through the open mouth with tongue extended.

(G) The nebulizer is inserted into the hole in the front of the enclosure and the fit test solution is sprayed into the enclosure using the same number of squeezes required to elicit a taste response in the screening test.

(H) After generating the aerosol the test subject shall be instructed to perform the exercises in subsection (1)(h) of this section.

(I) Every thirty seconds the aerosol concentration shall be replenished using one-half the number of squeezes as initially.

(J) The test subject shall indicate to the test conductor if at any time during the fit test the taste of saccharin is detected.

(K) If the taste of saccharin is detected, the fit is deemed unsatisfactory and a different respirator shall be tried.

(d) Irritant fume protocol.

(i) The respirator to be tested shall be equipped with high-efficiency particulate air (HEPA) filters.

(ii) The test subject shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its characteristic odor.

(iii) Break both ends of a ventilation smoke tube containing stannic oxychloride, such as the MSA part No. 5645, or equivalent. Attach one end of the smoke tube to a low flow air pump set to deliver two hundred milliliters per minute.

(iv) Advise the test subject that the smoke can be irritating to the eyes and instruct the subject to keep his/her eyes closed while the test is performed.

(v) The test conductor shall direct the stream of irritant smoke from the smoke tube towards the face seal area of the test subject. He/she shall begin at least twelve inches from the facepiece and gradually move to within one inch, moving around the whole perimeter of the mask.

(vi) The exercises identified in subsection (1)(n) of this section shall be performed by the test subject while the respirator seal is being challenged by the smoke.

(vii) Each test subject passing the smoke test without evidence of a response shall be given a sensitivity check of the smoke from the same tube once the respirator has been removed to determine whether he/she reacts to the smoke. Failure to evoke a response shall void the fit test.

(viii) The fit test shall be performed in a location with exhaust ventilation sufficient to prevent general contamination of the testing area by the test agent.

(3) Quantitative fit test (QNFT) protocol.

(a) General.

(i) The employer shall assign specific individuals who shall assume full responsibility for implementing the respirator quantitative fit test program.

(ii) The employer shall ensure that persons administering QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly and assure that test equipment is in proper working order.

(iii) The employer shall assure that QNFT equipment is kept clean and well maintained so as to operate at the parameters for which it was designed.

(b) Definitions.

(i) "Quantitative fit test." The test is performed in a test chamber. The normal air-purifying element of the respirator is replaced by a high-efficiency particulate air (HEPA) filter in the case of particulate QNFT aerosols or a sorbent offering contaminant penetration protection equivalent to high-efficiency filters where the QNFT test agent is a gas or vapor.

(ii) "Challenge agent" means the aerosol, gas, or vapor introduced into a test chamber so that its concentration inside and outside the respirator may be measured.

(iii) "Test subject" means the person wearing the respirator for quantitative fit testing.

(iv) "Normal standing position" means standing erect and straight with arms down along the sides and looking straight ahead.

(v) "Maximum peak penetration method" means the method of determining test agent penetration in the respirator as determined by strip chart recordings of the test. The highest peak penetration for a given exercise is taken to be representative of average penetration into the respirator for that exercise.

(vi) "Average peak penetration method" means the method of determining test agent penetration into the respirator utilizing a strip chart recorder, integrator, or computer. The agent penetration is determined by an average of the peak heights on the graph or by computer integration, for each exercise except the grimace exercise. Integrators or computers which calculate the actual test agent penetration into the respirator for each exercise will also be considered to meet the requirements of the average peak penetration method.

(vii) "Fit factor" means the ratio of challenge agent concentration outside with respect to the inside of a respirator inlet covering (facepiece or enclosure).

(c) Apparatus.

(i) Instrumentation. Aerosol generation, dilution, and measurement systems using corn oil or sodium chloride as test aerosols shall be used for quantitative fit testing.

(ii) Test chamber. The test chamber shall be large enough to permit all test subjects to perform freely all required exercises without disturbing the challenge agent concentration or the measurement apparatus. The test chamber shall be equipped and constructed so that the challenge agent is effectively isolated from the ambient air, yet uniform in concentration throughout the chamber.

(iii) When testing air-purifying respirators, the normal filter or cartridge element shall be replaced with a high-efficiency particulate filter supplied by the same manufacturer.

(iv) The sampling instrument shall be selected so that a strip chart record may be made of the test showing the rise and fall of the challenge agent concentration with each inspiration and expiration at fit factors of at least two thousand. Integrators or computers which integrate the amount of test agent penetration leakage into the respirator for each exercise may be used provided a record of the readings is made.

(v) The combination of substitute air-purifying elements, challenge agent and challenge agent concentration in the test chamber shall be such that the test subject is not exposed in excess of an established exposure limit for the challenge agent at any time during the testing process.

(vi) The sampling port on the test specimen respirator shall be placed and constructed so that no leakage occurs around the port (e.g., where the respirator is probed), a free air flow is allowed into the sampling line at all times and so that there is no interference with the fit or performance of the respirator.

(vii) The test chamber and test set up shall permit the person administering the test to observe the test subject inside the chamber during the test.

(viii) The equipment generating the challenge atmosphere shall maintain the concentration of challenge

agent inside the test chamber constant to within a ten percent variation for the duration of the test.

(ix) The time lag (interval between an event and the recording of the event on the strip chart or computer or integrator) shall be kept to a minimum. There shall be a clear association between the occurrence of an event inside the test chamber and its being recorded.

(x) The sampling line tubing for the test chamber atmosphere and for the respirator sampling port shall be of equal diameter and of the same material. The length of the two lines shall be equal.

(xi) The exhaust flow from the test chamber shall pass through a high-efficiency filter before release.

(xii) When sodium chloride aerosol is used, the relative humidity inside the test chamber shall not exceed fifty percent.

(xiii) The limitations of instrument detection shall be taken into account when determining the fit factor.

(xiv) Test respirators shall be maintained in proper working order and inspected for deficiencies such as cracks, missing valves and gaskets, etc.

(d) Procedural requirements.

(i) When performing the initial positive or negative pressure test the sampling line shall be crimped closed in order to avoid air pressure leakage during either of these tests.

(ii) An abbreviated screening isoamyl acetate test or irritant fume test may be utilized in order to quickly identify poor fitting respirators which passed the positive and/or negative pressure test and thus reduce the amount of QNFT time. When performing a screening isoamyl acetate test, combination high-efficiency organic vapor cartridges/canisters shall be used.

(iii) A reasonably stable challenge agent concentration shall be measured in the test chamber prior to testing. For canopy or shower curtain type of test units the determination of the challenge agent stability may be established after the test subject has entered the test environment.

(iv) Immediately after the subject enters the test chamber, the challenge agent concentration inside the respirator shall be measured to ensure that the peak penetration does not exceed five percent for a half mask or one percent for a full facepiece respirator.

(v) A stable challenge concentration shall be obtained prior to the actual start of testing.

(vi) Respirator restraining straps shall not be overtightened for testing. The straps shall be adjusted by the wearer without assistance from other persons to give a reasonable comfortable fit typical of normal use.

(vii) The test shall be terminated whenever any single peak penetration exceeds five percent for half masks and one percent for full facepiece respirators. The test subject shall be refitted and retested. If two of the three required tests are terminated, the fit shall be deemed inadequate.

(viii) In order to successfully complete a QNFT, three successful fit tests are required. The results of each of the three independent fit tests must exceed the minimum fit factor needed for the class of respirator (e.g., half mask respirator, full facepiece respirator).

(ix) Calculation of fit factors.

(A) The fit factor shall be determined for the quantitative fit test by taking the ratio of the average chamber concentration to the concentration inside the respirator.

(B) The average test chamber concentration is the arithmetic average of the test chamber concentration at the beginning and at the end of the test.

(C) The concentration of the challenge agent inside the respirator shall be determined by one of the following methods:

(I) Average peak concentration;

(II) Maximum peak concentration; or

(III) Integration by calculation of the area under the individual peak for each exercise. This includes computerized integration.

(x) Interpretation of test results. The fit factor established by the quantitative fit testing shall be the lowest of the three fit factor values calculated from the three required fit tests.

(xi) The test subject shall not be permitted to wear a half mask, or full facepiece respirator unless a minimum fit factor equivalent to at least ten times the hazardous exposure level is obtained.

(xii) Filters used for quantitative fit testing shall be replaced at least weekly, or whenever increased breathing resistance is encountered, or when the test agent has altered the integrity of the filter media. Organic vapor cartridges/canisters shall be replaced daily (when used) or sooner if there is any indication of breakthrough by a test agent.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-07533, filed 10/6/88, effective 11/7/88.]

WAC 296-62-07540 Formaldehyde. (1) Scope and application. This standard applies to all occupational exposures to formaldehyde, i.e., from formaldehyde gas, its solutions, and materials that release formaldehyde.

(2) Definitions. For purposes of this standard, the following definitions shall apply:

(a) "Action level" means a concentration of 0.5 part formaldehyde per million parts of air (0.5 ppm) calculated as an 8-hour time-weighted average (TWA) concentration.

(b) "Approved" means approved by the director of the department of labor and industries or his authorized representative: *Provided, however,* That should a provision of this chapter state that approval by an agency or organization other than the department of labor and industries is required, such as Underwriters' Laboratories or the Bureau of Mines, the provision of WAC 296-24-006 shall apply.

(c) "Authorized person" means a person approved or assigned by the employer to perform a specific type of duty or duties or to be at a specific location or locations at the job site.

(d) "Director" means the director of the department of labor and industries, or his designated representative.

(e) "Emergency" is any occurrence, such as but not limited to equipment failure, rupture of containers, or failure of control equipment that results in an uncontrolled release of a significant amount of formaldehyde.

(f) "Employee exposure" means the exposure to airborne formaldehyde which would occur without corrections for protection provided by any respirator that is in use.

(g) "Formaldehyde" means the chemical substance, HCHO, Chemical Abstracts Service Registry No. 50-00-0.

(3) Permissible exposure limit (PEL).

(a) TWA: The employer shall assure that no employee is exposed to an airborne concentration of formaldehyde which exceeds one part formaldehyde per million parts of air (1 ppm) as an 8-hour TWA.

(b) Short term exposure limit (STEL): The employer shall assure that no employee is exposed to an airborne concentration of formaldehyde which exceeds two parts formaldehyde per million parts of air (2 ppm) as a fifteen-minute STEL.

(4) Exposure monitoring.

(a) General.

(i) Each employer who has a workplace covered by this standard shall monitor employees to determine their exposure to formaldehyde.

(ii) Exceptions.

(A) The employer need not initiate exposure monitoring unless there is a formaldehyde hazard as defined in subsection (13) of this section or there are employee health complaints possibly associated with formaldehyde exposure.

(B) Where the employer documents, using objective data, that the presence of formaldehyde or formaldehyde-releasing products in the workplace cannot result in airborne concentrations of formaldehyde that would cause any employee to be exposed at or above the action level or the STEL under foreseeable conditions of use, the employer will not be required to measure employee exposure to formaldehyde unless there are employee health complaints possibly associated with formaldehyde exposure.

(iii) When an employee's exposure is determined from representative sampling, the measurements used shall be representative of the employee's full shift or short-term exposure to formaldehyde, as appropriate.

(iv) Representative samples for each job classification in each work area shall be taken for each shift unless the employer can document with objective data that exposure levels for a given job classification are equivalent for different workshifts.

(b) Initial monitoring. The employer shall identify all employees who may be exposed at or above the action level or at or above the STEL and accurately determine the exposure of each employee so identified.

(i) Unless the employer chooses to measure the exposure of each employee potentially exposed to formaldehyde, the employer shall develop a representative sampling strategy and measure sufficient exposures within each job classification for each workshift to correctly characterize and not underestimate the exposure of any employee within each exposure group.

(ii) The initial monitoring process shall be repeated each time there is a change in production, equipment,

process, personnel, or control measures which may result in new or additional exposure to formaldehyde.

(c) Periodic monitoring.

(i) The employer shall periodically measure and accurately determine exposure to formaldehyde for employees shown by the initial monitoring to be exposed at or above the action level or at or above the STEL.

(ii) If the last monitoring results reveal employee exposure at or above the action level, the employer shall repeat monitoring of the employees at least every six months.

(iii) If the last monitoring results reveal employee exposure at or above the STEL, the employer shall repeat monitoring of the employees at least once a year under worst conditions.

(d) Termination of monitoring. The employer may discontinue periodic monitoring for employees if results from two consecutive sampling periods taken at least seven days apart show that employee exposure is below the action level and the STEL. The results must be statistically representative and consistent with the employer's knowledge of the job and work operation.

(e) Accuracy of monitoring. Monitoring shall be accurate, at the ninety-five percent confidence level, to within plus or minus twenty-five percent for airborne concentrations of formaldehyde at the TWA and the STEL and to within plus or minus thirty-five percent for airborne concentrations of formaldehyde at the action level.

(f) Employee notification of monitoring results. Within fifteen days of receiving the results of exposure monitoring conducted under this standard, the employer shall notify the affected employees of these results. Notification shall be in writing, either by distributing copies of the results to the employees or by posting the results. If the employee exposure is over either PEL, the employer shall develop and implement a written plan to reduce employee exposure to or below both PELs, and give written notice to employees. The written notice shall contain a description of the corrective action being taken by the employer to decrease exposure.

(g) Observation of monitoring.

(i) The employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to formaldehyde required by this standard.

(ii) When observation of the monitoring of employee exposure to formaldehyde requires entry into an area where the use of protective clothing or equipment is required, the employer shall provide the clothing and equipment to the observer, require the observer to use such clothing and equipment, and assure that the observer complies with all other applicable safety and health procedures.

(5) Regulated areas.

(a) The employer shall establish regulated areas where the concentration of airborne formaldehyde exceeds either the TWA or the STEL and post all entrances and accessways with signs bearing the following information:

DANGER
FORMALDEHYDE
IRRITANT AND POTENTIAL CANCER HAZARD
AUTHORIZED PERSONNEL ONLY

(b) The employer shall limit access to regulated areas to authorized persons who have been trained to recognize the hazards of formaldehyde.

(c) An employer at a multi-employer worksite who establishes a regulated area shall communicate the access restrictions and locations of these areas to other employers with work operations at that worksite.

(6) Methods of compliance.

(a) Engineering controls and work practices. The employer shall institute engineering and work practice controls to reduce and maintain employee exposures to formaldehyde at or below the TWA and the STEL.

(b) Exception. Whenever the employer has established that feasible engineering and work practice controls cannot reduce employee exposure to or below either of the PELs, the employer shall apply these controls to reduce employee exposures to the extent feasible and shall supplement them with respirators which satisfy this standard.

(7) Respiratory protection.

(a) General. Where respiratory protection is required, the employer shall provide the respirators at no cost to the employee and shall assure that they are properly used. The respirators shall comply with the requirements of this standard and shall reduce the concentration of formaldehyde inhaled by the employee to at or below both the TWA and the STEL. Respirators shall be used in the following circumstances:

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

(ii) In work operations, such as maintenance and repair activities or vessel cleaning, for which the employer establishes that engineering and work practice controls are not feasible;

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

(iv) In emergencies.

(b) Respirator selection.

(i) The appropriate respirators as specified in Table 1 shall be selected from those approved by the Mine Safety and Health Administration (MSHA) and by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11.

(ii) The employer shall make available a powered air-purifying respirator, meeting the specifications in Table 1, to any employee who experiences difficulty wearing a negative-pressure respirator to reduce exposure to formaldehyde.

(c) Respirator usage.

(i) Whenever respirator use is required by this standard, the employer shall institute a respiratory protection program in accordance with WAC 296-62-07109, 296-62-07111, 296-62-07115, and 296-62-07117.

(ii) The employer shall perform either quantitative or qualitative face fit tests in accordance with the procedures outlined in Appendix E at the time of initial fitting and at least annually thereafter for all employees required by this standard to wear negative-pressure respirators.

(A) Respirators selected shall be from those exhibiting the best facepiece fit.

(B) No respirator shall be chosen that would potentially permit the employee to inhale formaldehyde at concentrations in excess of either the TWA or the STEL.

TABLE 1
MINIMUM REQUIREMENTS FOR RESPIRATORY
PROTECTION AGAINST FORMALDEHYDE

Condition of use or formaldehyde concentration (ppm)	Minimum respirator required ¹
Up to 10 ppm.....	Full facepiece with cartridges or canisters specifically approved for protection against formaldehyde ² .
Up to 100 ppm.....	Full-face mask, chest or back mounted type, with industrial size canister specifically approved for protection against formaldehyde. Type C supplied-air respirator, demand type, with full facepiece, hood, or helmet.
Above 100 ppm or unknown (emergencies).....	Self-contained breathing apparatus (SCBA) with positive-pressure full facepiece. Combination supplied-air, full facepiece positive-pressure respirator with auxiliary self-contained air supply.
Firefighting.....	SCBA with positive-pressure in full facepiece.
Escape.....	SCBA in demand or pressure demand mode. Full-face mask, front or back mounted type with industrial size canister specifically approved for protection against formaldehyde.

¹ Respirators specified for use at higher concentrations may be used at lower concentrations.

² A half-mask respirator with cartridges specifically approved for protection against formaldehyde can be substituted for the full facepiece respirator providing that effective gas-proof goggles are provided and used in combination with the half-mask respirator.

(iii) Where air purifying chemical cartridge respirators are used, the cartridges shall be replaced after three hours of use or at the end of the workshift, whichever is sooner unless the cartridge contains a NIOSH-approved end-of-service indicator to show when breakthrough occurs.

(iv) Unless the canister contains a NIOSH-approved end-of-service life indicator to show when breakthrough occurs, canisters used in atmospheres up to 10 ppm shall be replaced every four hours and industrial sized canisters used in atmospheres up to 100 ppm shall be replaced every two hours or at the end of the workshift, whichever is sooner.

(v) Employers shall permit employees to leave the work area to wash their faces and respirator facepieces as needed to prevent skin irritation from respirator use.

(8) Protective equipment and clothing. Employers shall comply with the provisions of WAC 296-24-07501 and 296-24-078. When protective equipment or clothing is provided under these provisions, the employer shall provide these protective devices at no cost to the employee and assure that the employee wears them.

(a) Selection. The employer shall select protective clothing and equipment based upon the form of formaldehyde to be encountered, the conditions of use, and the hazard to be prevented.

(i) All contact of the eyes and skin with liquids containing one percent or more formaldehyde shall be prevented by the use of chemical protective clothing made of material impervious to formaldehyde and the use of other personal protective equipment, such as goggles and face shields, as appropriate to the operation.

(ii) Contact with irritating or sensitizing materials shall be prevented to the extent necessary to eliminate the hazard.

(iii) Where a face shield is worn, chemical safety goggles are also required if there is a danger of formaldehyde reaching the area of the eye.

(iv) Full body protection shall be worn for entry into areas where concentrations exceed 100 ppm and for emergency reentry into areas of unknown concentration.

(b) Maintenance of protective equipment and clothing.

(i) The employer shall assure that protective equipment and clothing that has become contaminated with formaldehyde is cleaned or laundered before its reuse.

(ii) When ventilating formaldehyde-contaminated clothing and equipment, the employer shall establish a storage area so that employee exposure is minimized. Containers for contaminated clothing and equipment and storage areas shall have labels and signs containing the following information:

DANGER
FORMALDEHYDE-CONTAMINATED (CLOTHING)
EQUIPMENT
AVOID INHALATION AND SKIN CONTACT

(iii) The employer shall assure that only persons trained to recognize the hazards of formaldehyde remove the contaminated material from the storage area for purposes of cleaning, laundering, or disposal.

(iv) The employer shall assure that no employee takes home equipment or clothing that is contaminated with formaldehyde.

(v) The employer shall repair or replace all required protective clothing and equipment for each affected employee as necessary to assure its effectiveness.

(vi) The employer shall inform any person who launders, cleans, or repairs such clothing or equipment of formaldehyde's potentially harmful effects and of procedures to safely handle the clothing and equipment.

(9) Hygiene protection.

(a) The employer shall provide change rooms, as described in WAC 296-24-120 for employees who are required to change from work clothing into protective clothing to prevent skin contact with formaldehyde.

(b) If employees' skin may become splashed with solutions containing one percent or greater formaldehyde, for example because of equipment failure or improper work practices, the employer shall provide conveniently located quick drench showers and assure that affected employees use these facilities immediately.

(c) If there is any possibility that an employee's eyes may be splashed with solutions containing 0.1 percent or greater formaldehyde, the employer shall provide acceptable eyewash facilities within the immediate work area for emergency use.

(10) Housekeeping. For operations involving formaldehyde liquids or gas, the employer shall conduct a program to detect leaks and spills, including regular visual inspections.

(a) Preventative maintenance of equipment, including surveys for leaks, shall be undertaken at regular intervals.

(b) In work areas where spillage may occur, the employer shall make provisions to contain the spill, to decontaminate the work area, and to dispose of the waste.

(c) The employer shall assure that all leaks are repaired and spills are cleaned promptly by employees wearing suitable protective equipment and trained in proper methods for cleanup and decontamination.

(d) Formaldehyde-contaminated waste and debris resulting from leaks or spills shall be placed for disposal in sealed containers bearing a label warning of formaldehyde's presence and of the hazards associated with formaldehyde.

(11) Emergencies. For each workplace where there is the possibility of an emergency involving formaldehyde, the employer shall assure appropriate procedures are adopted to minimize injury and loss of life. Appropriate procedures shall be implemented in the event of an emergency.

(12) Medical surveillance.

(a) Employees covered.

(i) The employer shall institute medical surveillance programs for all employees exposed to formaldehyde at concentrations at or exceeding the action level or exceeding the STEL.

(ii) The employer shall make medical surveillance available for employees who develop signs and symptoms of overexposure to formaldehyde and for all employees exposed to formaldehyde in emergencies. When determining whether an employee may be experiencing signs and symptoms of possible overexposure to formaldehyde, the employer may rely on the evidence that signs and symptoms associated with formaldehyde exposure will occur only in exceptional circumstances when airborne

exposure is less than 0.1 ppm and when formaldehyde is present in materials in concentrations less than 0.1 percent.

(b) Examination by a physician. All medical procedures, including administration of medical disease questionnaires, shall be performed by or under the supervision of a licensed physician and shall be provided without cost to the employee, without loss of pay, and at a reasonable time and place.

(c) Medical disease questionnaire. The employer shall make the following medical surveillance available to employees prior to assignment to a job where formaldehyde exposure is at or above the action level or above the STEL and annually thereafter. The employer shall also make the following medical surveillance available promptly upon determining that an employee is experiencing signs and symptoms indicative of possible overexposure to formaldehyde.

(i) Administration of a medical disease questionnaire, such as in Appendix D, which is designed to elicit information on work history, smoking history, any evidence of eye, nose, or throat irritation; chronic airway problems or hyperreactive airway disease; allergic skin conditions or dermatitis; and upper or lower respiratory problems.

(ii) A determination by the physician, based on evaluation of the medical disease questionnaire, of whether a medical examination is necessary for employees not required to wear respirators to reduce exposure to formaldehyde.

(d) Medical examinations. Medical examinations shall be given to any employee who the physician feels, based on information in the medical disease questionnaire, may be at increased risk from exposure to formaldehyde and at the time of initial assignment and at least annually thereafter to all employees required to wear a respirator to reduce exposure to formaldehyde. The medical examination shall include:

(i) A physical examination with emphasis on evidence of irritation or sensitization of the skin and respiratory system, shortness of breath, or irritation of the eyes.

(ii) Laboratory examinations for respirator wearers consisting of baseline and annual pulmonary function tests. As a minimum, these tests shall consist of forced vital capacity (FVC), forced expiratory volume in one second (FEV1), and forced expiratory flow (FEF).

(iii) Any other test which the examining physician deems necessary to complete the written opinion.

(iv) Counseling of employees having medical conditions that would be directly or indirectly aggravated by exposure to formaldehyde on the increased risk of impairment of their health.

(e) Examinations for employees exposed in an emergency. The employer shall make medical examinations available as soon as possible to all employees who have been exposed to formaldehyde in an emergency.

(i) The examination shall include a medical and work history with emphasis on any evidence of upper or lower respiratory problems, allergic conditions, skin reaction or hypersensitivity, and any evidence of eye, nose, or throat irritation.

(ii) Other examinations shall consist of those elements considered appropriate by the examining physician.

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

(i) A copy of this standard and Appendices A, C, D, and E;

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

(iii) The representative exposure level for the employee's job assignment;

(iv) Information concerning any personal protective equipment and respiratory protection used or to be used by the employee; and

(v) Information from previous medical examinations of the affected employee within the control of the employer.

(vi) In the event of a nonroutine examination because of an emergency, the employer shall provide to the physician as soon as possible: A description of how the emergency occurred and the exposure the victim may have received.

(g) Physician's written opinion.

(i) For each examination required under this standard, the employer shall obtain a written opinion from the examining physician. This written opinion shall contain the results of the medical examination except that it shall not reveal specific findings or diagnoses unrelated to occupational exposure to formaldehyde. The written opinion shall include:

(A) The physician's opinion as to whether the employee has any medical condition that would place the employee at an increased risk of material impairment of health from exposure to formaldehyde;

(B) Any recommended limitations on the employee's exposure or changes in the use of personal protective equipment, including respirators;

(C) A statement that the employee has been informed by the physician of any medical conditions which would be aggravated by exposure to formaldehyde, whether these conditions may have resulted from past formaldehyde exposure or from exposure in an emergency, and whether there is a need for further examination or treatment.

(ii) The employer shall provide for retention of the results of the medical examination and tests conducted by the physician.

(iii) The employer shall provide a copy of the physician's written opinion to the affected employee within fifteen days of its receipt.

(13) Hazard communication.

(a) General. Notwithstanding any exemption granted in WAC 296-62-05403 (6)(c) for wood products, each employer who has a workplace covered by this standard shall comply with the requirements of WAC 296-62-05409 through 296-62-05419.

(i) For purposes of hazard communication, formaldehyde gas, all mixtures or solutions composed of greater than 0.1 percent formaldehyde, and materials capable of releasing formaldehyde into the air under any normal

condition of use at concentrations reaching or exceeding 0.1 ppm shall be considered a health hazard.

(ii) As a minimum, specific health hazards that the employer shall address are: Cancer, irritation and sensitization of the skin and respiratory system, eye and throat irritation, and acute toxicity.

(b) Manufacturers and importers who produce or import formaldehyde or formaldehyde-containing products shall provide downstream employers using or handling these products with an objective determination through the required labels and MSDSs if these items may constitute a health hazard within the meaning of WAC 296-62-05407 under normal conditions of use.

(c) Labels.

(i) The employer shall assure that hazard warning labels complying with the requirements of WAC 296-62-05411 are affixed to all containers where the presence of formaldehyde constitutes a health hazard.

(ii) Information on labels. As a minimum, labels shall identify the hazardous chemical; list the name and address of the responsible party; contain the information "potential cancer hazard"; and appropriately warn of all other hazards as defined in Part C (WAC 296-62-054 through 296-62-05425), Appendices A and B.

(iii) Substitute warning labels. The employer may use warning labels required by other statutes, regulations, or ordinances which impart the same information as the warning statements required by this subitem.

(d) Material safety data sheets.

(i) Any employer who uses formaldehyde-containing materials that constitute a health hazard as defined in this standard shall comply with the requirements of WAC 296-62-05413 with regard to the development and updating of material safety data sheets.

(ii) Manufacturers, importers, and distributors of formaldehyde containing materials that constitute a health hazard as defined in this standard shall assure that material safety data sheets and updated information are provided to all employers purchasing such materials at the time of the initial shipment and at the time of the first shipment after a material safety data sheet is updated.

(14) Employee information and training.

(a) Employee training. Written materials for employee training shall be updated as soon as possible, but no later than two months after the effective date of the standard.

(b) Participation. The employer shall assure that all employees who are assigned to workplaces where there is a health hazard from formaldehyde participate in a training program.

(c) Frequency.

(i) Employers shall provide employees with information and training on formaldehyde at the time of their initial assignment and whenever a new hazard from formaldehyde is introduced into their work area.

(ii) Employers shall provide such information and training at least annually for all employees exposed to formaldehyde concentrations at or above the action level or the STEL.

(d) Training program. The training program shall be conducted in a manner which the employee is able to understand and shall include:

(i) A discussion of the contents of this regulation and the contents of the material safety data sheet;

(ii) The purpose for and a description of the medical surveillance program required by this standard, including:

(A) A description of the potential health hazards associated with exposure to formaldehyde and a description of the signs and symptoms of exposure to formaldehyde.

(B) Instructions to immediately report to the employer the development of any adverse signs or symptoms that the employee suspects is attributable to formaldehyde exposure.

(iii) Description of operations in the work area where formaldehyde is present and an explanation of the safe work practices appropriate for limiting exposure to formaldehyde in each job;

(iv) The purpose for, proper use of, and limitations of personal protective clothing and equipment;

(v) Instructions for the handling of spills, emergencies, and clean-up procedures;

(vi) An explanation of the importance of engineering and work practice controls for employee protection and any necessary instruction in the use of these controls; and

(vii) A review of emergency procedures including the specific duties or assignments of each employee in the event of an emergency.

(e) Access to training materials.

(i) The employer shall inform all affected employees of the location of written training materials and shall make these materials readily available, without cost, to the affected employees.

(ii) The employer shall provide, upon request, all training materials relating to the employee training program to the director of labor and industries, or his designated representative.

(15) Recordkeeping.

(a) Exposure measurements. The employer shall establish and maintain an accurate record of all measurements taken to monitor employee exposure to formaldehyde. This record shall include:

(i) The date of measurement;

(ii) The operation being monitored;

(iii) The methods of sampling and analysis and evidence of their accuracy and precision;

(iv) The number, durations, time, and results of samples taken;

(v) The types of protective devices worn; and

(vi) The names, job classifications, Social Security numbers, and exposure estimates of the employees whose exposures are represented by the actual monitoring results.

(b) Exposure determinations. Where the employer has determined that no monitoring is required under this standard, the employer shall maintain a record of the objective data relied upon to support the determination

that no employee is exposed to formaldehyde at or above the action level.

(c) Medical surveillance. The employer shall establish and maintain an accurate record for each employee subject to medical surveillance under this standard. This record shall include:

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

(ii) The physician's written opinion;

(iii) A list of any employee health complaints that may be related to exposure to formaldehyde; and

(iv) A copy of the medical examination results, including medical disease questionnaires and results of any medical tests required by the standard or mandated by the examining physician.

(d) Respirator fit testing.

(i) The employer shall establish and maintain accurate records for employees subject to negative-pressure respirator fit testing required by this standard.

(ii) This record shall include:

(A) A copy of the protocol selected for respirator fit testing;

(B) A copy of the results of any fit testing performed;

(C) The size and manufacturer of the types of respirators available for selection; and

(D) The date of the most recent fit testing, the name and Social Security number of each tested employee, and the respirator type and facepiece selected.

(e) Record retention. The employer shall retain records required by this standard for at least the following periods:

(i) Exposure records and determinations shall be kept for at least thirty years;

(ii) Medical records shall be kept for the duration of employment plus thirty years; and

(iii) Respirator fit testing records shall be kept until replaced by a more recent record.

(f) Availability of records.

(i) Upon request, the employer shall make all records maintained as a requirement of this standard available for examination and copying to the director of labor and industries, or his designated representative.

(ii) The employer shall make employee exposure records, including estimates made from representative monitoring and available upon request for examination and copying, to the subject employee, or former employee, and employee representatives in accordance with WAC 296-62-052 through 296-62-05209 and 296-62-05213 through 296-62-05217.

(iii) Employee medical records required by this standard shall be provided upon request for examination and copying, to the subject employee, or former employee, or to anyone having the specific written consent of the subject employee or former employee.

(16) Effective dates.

(a) Laboratories. This standard shall become effective for anatomy, histology, and pathology laboratories thirty days after the adoption date, except as noted in (b) of this subsection. For all laboratories other than anatomy, histology, and pathology, subsections (2) and (4) through (15) of this section shall become effective on

September 1, 1988, except as noted in (b) of this subsection.

(b) Engineering and work practice controls. Engineering and work practice controls required by this standard shall be implemented as soon as possible, but no later than February 2, 1989.

(c) Employee training. Written materials for employee training shall be updated as soon as possible, but no later than two months after the effective date of the standard.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-07540, filed 10/6/88, effective 11/7/88.]

WAC 296-62-07542 Appendix A--Substance technical guideline for formalin. (1) The following substance technical guideline for formalin provides information on uninhibited formalin solution (thirty-seven percent formaldehyde, no methanol stabilizer). It is designed to inform employees at the production level of their rights and duties under the formaldehyde standard whether their job title defines them as workers or supervisors. Much of the information provided is general; however, some information is specific for formalin. When employee exposure to formaldehyde is from resins capable of releasing formaldehyde, the resin itself and other impurities or decomposition products may also be toxic, and employers should include this information as well when informing employees of the hazards associated with the materials they handle. The precise hazards associated with exposure to formaldehyde depend both on the form (solid, liquid, or gas) of the material and the concentration of formaldehyde present. For example, thirty-seven to fifty percent solutions of formaldehyde present a much greater hazard to the skin and eyes from spills or splashes than solutions containing less than one percent formaldehyde. Individual substance technical guidelines used by the employer for training employees should be modified to properly give information on the material actually being used.

(a) Substance identification.

(i) Chemical name: Formaldehyde.

(ii) Chemical family: Aldehyde.

(iii) Chemical formula: HCHO.

(iv) Molecular weight: 30.03.

(v) Chemical abstracts service number (CAS number): 50-00-0.

Synonyms: Formalin; Formic Aldehyde; Paraform; Formol; Formalin (Methanol-free); Fyde; Formalith; Methanal; Methyl Aldehyde; Methylene Glycol; Methylene Oxide; Tetraoxymethalene; Oxomethane; Oxymethylene.

(b) Components and contaminants.

(i) Percent: 37.0 Formaldehyde.

(ii) Percent: 63.0 water.

Note. Inhibited solutions contain methanol.

(iii) Other contaminants: Formic acid (alcohol free).

Exposure limits:

(A) WISHA TWA-1 ppm.

(B) WISHA STEL-2 ppm.

(c) Physical data.

(i) Description: Colorless liquid, pungent odor.

(ii) Boiling point: 214°F (101°C).

(iii) Specific gravity: 1.08 (H₂O=1 @ 20 C).

(iv) pH: 2.8-4.0.

(v) Solubility in water: Miscible.

(vi) Solvent solubility: Soluble in alcohol and acetone.

(vii) Vapor density: 1.04 (Air=1 @ 20 C).

(viii) Odor threshold: 0.8-1 ppm.

(d) Fire and explosion hazard.

(i) Moderate fire and explosion hazard when exposed to heat or flame.

(ii) The flash point of thirty-seven percent formaldehyde solutions is above normal room temperature, but the explosion range is very wide, from seven to seventy-three percent by volume in air.

(iii) Reaction of formaldehyde with nitrogen dioxide, nitromethane, perchloric acid and aniline, or peroxyformic acid yields explosive compounds.

(iv) Flash point: 185°F (85°C) closed cup.

(v) Lower explosion limit: Seven percent.

(vi) Upper explosion limit: Seventy-three percent.

(vii) Autoignition temperature: 806°F (430°C).

(viii) Flammable class (WISHA): III A.

Extinguishing media:

(I) Use dry chemical, "alcohol foam," carbon dioxide, or water in flooding amounts as fog. Solid streams may not be effective. Cool fire-exposed containers with water from side until well after fire is out.

(II) Use of water spray to flush spills can also dilute the spill to produce nonflammable mixtures. Water runoff, however, should be contained for treatment.

(ix) National Fire Protection Association Section 325M Designation:

(A) Health: 2-Materials hazardous to health, but areas may be entered with full-faced mask self-contained breathing apparatus which provides eye protection.

(B) Flammability: 2-Materials which must be moderately heated before ignition will occur. Water spray may be used to extinguish the fire because the material can be cooled below its flash point.

(C) Reactivity: D-Materials which (in themselves) are normally stable even under fire exposure conditions and which are not reactive with water. Normal fire fighting procedures may be used.

(e) Reactivity.

(i) Stability: Formaldehyde solutions may self-polymerize to form paraformaldehyde which precipitates.

(ii) Incompatibility (materials to avoid):

(A) Strong oxidizing agents, caustics, strong alkalies, isocyanates, anhydrides, oxides, and inorganic acids.

(B) Formaldehyde reacts with hydrochloric acid to form the potent carcinogen, bis-chloromethyl ether. Formaldehyde reacts with nitrogen dioxide, nitromethane, perchloric acid and aniline, or peroxyformic acid to yield explosive compounds. A violent reaction occurs when formaldehyde is mixed with strong oxidizers.

(C) Hazardous combustion or decomposition products: Oxygen from the air can oxidize formaldehyde to formic acid, especially when heated. Formic acid is corrosive.

(f) Health hazard data.

(i) Acute effects of exposure.

(A) Ingestion (swallowing): Liquids containing ten to forty percent formaldehyde cause severe irritation and inflammation of the mouth, throat, and stomach. Severe stomach pains will follow ingestion with possible loss of consciousness and death. Ingestion of dilute formaldehyde solutions (0.03–0.04%) may cause discomfort in the stomach and pharynx.

(B) Inhalation (breathing):

(I) Formaldehyde is highly irritating to the upper respiratory tract and eyes. Concentrations of 0.5 to 2.0 ppm may irritate the eyes, nose, and throat of some individuals.

(II) Concentrations of 3 to 5 ppm also cause tearing of the eyes and are intolerable to some persons.

(III) Concentrations of 10 to 20 ppm cause difficulty in breathing, burning of the nose and throat, coughing, and heavy tearing of the eyes, and 25 to 30 ppm causes severe respiratory tract injury leading to pulmonary edema and pneumonitis. A concentration of 100 ppm is immediately dangerous to life and health. Deaths from accidental exposure to high concentrations of formaldehyde have been reported.

(C) Skin (dermal): Formalin is a severe skin irritant and a sensitizer. Contact with formalin causes white discoloration, smarting, drying, cracking, and scaling. Prolonged and repeated contact can cause numbness and a hardening or tanning of the skin. Previously exposed persons may react to future exposure with an allergic eczematous dermatitis or hives.

(D) Eye contact: Formaldehyde solutions splashed in the eye can cause injuries ranging from transient discomfort to severe, permanent corneal clouding and loss of vision. The severity of the effect depends on the concentration of formaldehyde in the solution and whether or not the eyes are flushed with water immediately after the accident.

Note: The perception of formaldehyde by odor and eye irritation becomes less sensitive with time as one adapts to formaldehyde. This can lead to overexposure if a worker is relying on formaldehyde's warning properties to alert him or her to the potential for exposure.

(E) Acute animal toxicity:

(I) Oral, rats: LD50=800 mg/kg.

(II) Oral, mouse: LD50=42 mg/kg.

(III) Inhalation, rats: LC50=250 mg/kg.

(IV) Inhalation, mouse: LC50=900 mg/kg.

(V) Inhalation, rats: LC50=590 mg/kg.

(g) Chronic effects of exposure.

(i) Carcinogenicity: Formaldehyde has the potential to cause cancer in humans. Repeated and prolonged exposure increases the risk. Various animal experiments have conclusively shown formaldehyde to be a carcinogen in rats. In humans, formaldehyde exposure has been associated with cancers of the lung, nasopharynx and oropharynx, and nasal passages.

(ii) Mutagenicity: Formaldehyde is genotoxic in several in vitro test systems showing properties of both an initiator and a promoter.

(iii) Toxicity: Prolonged or repeated exposure to formaldehyde may result in respiratory impairment. Rats exposed to formaldehyde at 2 ppm developed benign nasal tumors and changes of the cell structure in the nose as well as inflamed mucous membranes of the nose. Structural changes in the epithelial cells in the human nose have also been observed. Some persons have developed asthma or bronchitis following exposure to formaldehyde, most often as the result of an accidental spill involving a single exposure to a high concentration of formaldehyde.

(h) Emergency and first-aid procedures.

(i) Ingestion (swallowing): If the victim is conscious, dilute, inactivate, or absorb the ingested formaldehyde by giving milk, activated charcoal, or water. Any organic material will inactivate formaldehyde. Keep affected person warm and at rest. Get medical attention immediately. If vomiting occurs, keep head lower than hips.

(ii) Inhalation (breathing): Remove the victim from the exposure area to fresh air immediately. Where the formaldehyde concentration may be very high, each rescuer must put on a self-contained breathing apparatus before attempting to remove the victim, and medical personnel should be informed of the formaldehyde exposure immediately. If breathing has stopped, give artificial respiration. Keep the affected person warm and at rest. Qualified first-aid or medical personnel should administer oxygen, if available, and maintain the patient's airways and blood pressure until the victim can be transported to a medical facility. If exposure results in a highly irritated upper respiratory tract and coughing continues for more than ten minutes, the worker should be hospitalized for observation and treatment.

(iii) Skin contact: Remove contaminated clothing (including shoes) immediately. Wash the affected area of your body with soap or mild detergent and large amounts of water until no evidence of the chemical remains (at least fifteen to twenty minutes). If there are chemical burns, get first aid to cover the area with sterile, dry dressing, and bandages. Get medical attention if you experience appreciable eye or respiratory irritation.

(iv) Eye contact: Wash the eyes immediately with large amounts of water occasionally lifting lower and upper lids, until no evidence of chemical remains (at least fifteen to twenty minutes). In case of burns, apply sterile bandages loosely without medication. Get medical attention immediately. If you have experienced appreciable eye irritation from a splash or excessive exposure, you should be referred promptly to an ophthalmologist for evaluation.

(i) Emergency procedures.

(i) Emergencies:

(A) If you work in an area where a large amount of formaldehyde could be released in an accident or from equipment failure, your employer must develop procedures to be followed in event of an emergency. You should be trained in your specific duties in the event of an emergency, and it is important that you clearly understand these duties. Emergency equipment must be

accessible and you should be trained to use any equipment that you might need. Formaldehyde contaminated equipment must be cleaned before reuse.

(B) If a spill of appreciable quantity occurs, leave the area quickly unless you have specific emergency duties. Do not touch spilled material. Designated persons may stop the leak and shut off ignition sources if these procedures can be done without risk. Designated persons should isolate the hazard area and deny entry except for necessary people protected by suitable protective clothing and respirators adequate for the exposure. Use water spray to reduce vapors. Do not smoke, and prohibit all flames or flares in the hazard area.

(ii) Special firefighting procedures:

(A) Learn procedures and responsibilities in the event of a fire in your workplace.

(B) Become familiar with the appropriate equipment and supplies and their location.

(C) In firefighting, withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

(j) Spill, leak, and disposal procedures.

(i) Occupational spill: For small containers, place the leaking container in a well ventilated area. Take up small spills with absorbent material and place the waste into properly labeled containers for later disposal. For larger spills, dike the spill to minimize contamination and facilitate salvage or disposal. You may be able to neutralize the spill with sodium hydroxide or sodium sulfite. Your employer must comply with EPA rules regarding the clean-up of toxic waste and notify state and local authorities, if required. If the spill is greater than 1,000 lb/day, it is reportable under EPA's superfund legislation.

(ii) Waste disposal: Your employer must dispose of waste containing formaldehyde in accordance with applicable local, state, and federal law and in a manner that minimizes exposure of employees at the site and of the clean-up crew.

(k) Monitoring and measurement procedures.

(i) Monitoring requirements: If your exposure to formaldehyde exceeds the 0.5 ppm action level or the 2 ppm STEL, your employer must monitor your exposure. Your employer need not measure every exposure if a "high exposure" employee can be identified. This person usually spends the greatest amount of time nearest the process equipment. If you are a "representative employee," you will be asked to wear a sampling device to collect formaldehyde. This device may be a passive badge, a sorbent tube attached to a pump, or an impinger containing liquid. You should perform your work as usual, but inform the person who is conducting the monitoring of any difficulties you are having wearing the device.

(ii) Evaluation of 8-hour exposure: Measurements taken for the purpose of determining time-weighted average (TWA) exposures are best taken with samples covering the full shift. Samples collected must be taken from the employee's breathing zone air.

(iii) Short-term exposure evaluation: If there are tasks that involve brief but intense exposure to formaldehyde, employee exposure must be measured to assure compliance with the STEL. Sample collections are for brief periods, only fifteen minutes, but several samples may be needed to identify the peak exposure.

(iv) Monitoring techniques: WISHA's only requirement for selecting a method for sampling and analysis is that the methods used accurately evaluate the concentration of formaldehyde in employees' breathing zones. Sampling and analysis may be performed by collection of formaldehyde on liquid or solid sorbents with subsequent chemical analysis. Sampling and analysis may also be performed by passive diffusion monitors and short-term exposure may be measured by instruments such as real-time continuous monitoring systems and portable direct reading instruments.

(v) Notification of results: Your employer must inform you of the results of exposure monitoring representative of your job. You may be informed in writing, but posting the results where you have ready access to them constitutes compliance with the standard.

(l) Protective equipment and clothing.

(Material impervious to formaldehyde is needed if the employee handles formaldehyde solutions of one percent or more. Other employees may also require protective clothing or equipment to prevent dermatitis.)

(i) Respiratory protection:

(A) Use NIOSH-approved full facepiece negative pressure respirators equipped with approved cartridges or canisters within the use limitations of these devices. (Present restrictions on cartridges and canisters do not permit them to be used for a full workshift.) In all other situations, use positive pressure respirators such as the positive-pressure air purifying respirator or the self-contained breathing apparatus (SCBA).

(B) If you use a negative pressure respirator, your employer must provide you with fit testing of the respirator at least once a year in accordance with the procedures outlined in WAC 296-62-07550 Appendix E.

(ii) Protective gloves:

(A) Wear protective (impervious) gloves provided by your employer, at no cost, to prevent contact with formalin.

(B) Your employer should select these gloves based on the results of permeation testing and in accordance with the ACGIH guidelines for selection of chemical protective clothing.

(iii) Eye protection:

(A) If you might be splashed in the eyes with formalin, it is essential that you wear goggles or some other type of complete protection for the eye.

(B) You may also need a face shield if your face is likely to be splashed with formalin, but you must not substitute face shields for eye protection. (This section pertains to formaldehyde solutions of one percent or more.)

(iv) Other protective equipment:

(A) You must wear protective (impervious) clothing and equipment provided by your employer at no cost to

prevent repeated or prolonged contact with formaldehyde liquids.

(B) If you are required to change into whole-body chemical protective clothing, your employer must provide a change room for your privacy and for storage of your normal clothing.

(C) If you are splashed with formaldehyde, use the emergency showers and eyewash fountains provided by your employer immediately to prevent serious injury. Report the incident to your supervisor and obtain necessary medical support.

(2) Entry into an IDLH atmosphere. Enter areas where the formaldehyde concentration might be 100 ppm or more only with complete body protection including a self-contained breathing apparatus with a full facepiece operated in a positive pressure mode or a supplied-air respirator with full facepiece and operated in a positive pressure mode. This equipment is essential to protect your life and health under such extreme conditions.

(a) Engineering controls.

(i) Ventilation is the most widely applied engineering control method for reducing the concentration of airborne substances in the breathing zones of workers. There are two distinct types of ventilation.

(ii) Local exhaust: Local exhaust ventilation is designed to capture airborne contaminants as near to the point of generation as possible. To protect you, the direction of contaminant flow must always be toward the local exhaust system inlet and away from you.

(iii) General (mechanical):

(A) General dilution ventilation involves continuous introduction of fresh air into the workroom to mix with the contaminated air and lower your breathing zone concentration of formaldehyde. Effectiveness depends on the number of air changes per hour.

(B) Where devices emitting formaldehyde are spread out over a large area, general dilution ventilation may be the only practical method of control.

(iv) Work practices: Work practices and administrative procedures are an important part of a control system. If you are asked to perform a task in a certain manner to limit your exposure to formaldehyde, it is extremely important that you follow these procedures.

(b) Medical surveillance.

(i) Medical surveillance helps to protect employees' health. You are encouraged strongly to participate in the medical surveillance program.

(ii) Your employer must make a medical surveillance program available at no expense to you and at a reasonable time and place if you are exposed to formaldehyde at concentrations above 0.5 ppm as an 8-hour average or 2 ppm over any fifteen-minute period.

(A) You will be offered medical surveillance at the time of your initial assignment and once a year afterward as long as your exposure is at least 0.5 ppm (TWA) or 2 ppm (STEL).

(B) Even if your exposure is below these levels, you should inform your employer if you have signs and symptoms that you suspect, through your training, are related to your formaldehyde exposure because you may

need medical surveillance to determine if your health is being impaired by your exposure.

(iii) The surveillance plan includes:

(A) A medical disease questionnaire.

(B) A physical examination if the physician determines this is necessary.

(iv) If you are required to wear a respirator, your employer must offer you a physical examination and a pulmonary function test every year.

(v) The physician must collect all information needed to determine if you are at increased risk from your exposure to formaldehyde. At the physician's discretion, the medical examination may include other tests, such as a chest x-ray, to make this determination.

(vi) After a medical examination the physician will provide your employer with a written opinion which includes any special protective measures recommended and any restrictions on your exposure. The physician must inform you of any medical conditions you have which would be aggravated by exposure to formaldehyde. All records from your medical examinations, including disease surveys, must be retained at your employer's expense.

(c) Emergencies.

(i) If you are exposed to formaldehyde in an emergency and develop signs or symptoms associated with acute toxicity from formaldehyde exposure, your employer must provide you with a medical examination as soon as possible.

(ii) This medical examination will include all steps necessary to stabilize your health.

(iii) You may be kept in the hospital for observation if your symptoms are severe to ensure that any delayed effects are recognized and treated.

[Statutory Authority: Chapter 49:17 RCW. 88-21-002 (Order 88-23), § 296-62-07542, filed 10/6/88, effective 11/7/88.]

WAC 296-62-07544 Appendix B--Sampling strategy and analytical methods for formaldehyde. (1) To protect the health of employees, exposure measurements must be unbiased and representative of employee exposure. The proper measurement of employee exposure requires more than a token commitment on the part of the employer. WISHA's mandatory requirements establish a baseline; under the best of circumstances all questions regarding employee exposure will be answered. Many employers, however, will wish to conduct more extensive monitoring before undertaking expensive commitments, such as engineering controls, to assure that the modifications are truly necessary. The following sampling strategy, which was developed at NIOSH by Nelson A. Leidel, Kenneth A. Busch, and Jeremiah R. Lynch and described in NIOSH publication No. 77-173 (Occupational Exposure Sampling Strategy Manual) will assist the employer in developing a strategy for determining the exposure of his or her employees.

(2) There is no one correct way to determine employee exposure. Obviously, measuring the exposure of every employee exposed to formaldehyde will provide the most information on any given day. Where few employees are exposed, this may be a practical solution. For

most employers, however, use of the following strategy will give just as much information at less cost.

(3) Exposure data collected on a single day will not automatically guarantee the employer that his or her workplace is always in compliance with the formaldehyde standard. This does not imply, however, that it is impossible for an employer to be sure that his or her worksite is in compliance with the standard. Indeed, a properly designed sampling strategy showing that all employees are exposed below the PELs, at least with a ninety-five percent certainty, is compelling evidence that the exposure limits are being achieved provided that measurements are conducted using valid sampling strategy and approved analytical methods.

(4) There are two PELs, the TWA concentration and the STEL.

(a) Most employers will find that one of these two limits is more critical in the control of their operations, and OSHA expects that the employer will concentrate monitoring efforts on the critical component.

(b) If the more difficult exposure is controlled, this information, along with calculations to support the assumptions, should be adequate to show that the other exposure limit is also being achieved.

(5) Sampling strategy.

(a) Determination of the need for exposure measurements.

(b) The employer must determine whether employees may be exposed to concentrations in excess of the action level. This determination becomes the first step in an employee exposure monitoring program that minimizes employer sampling burdens while providing adequate employee protection.

(c) If employees may be exposed above the action level, the employer must measure exposure. Otherwise, an objective determination that employee exposure is low provides adequate evidence that exposure potential has been examined.

(d) The employer should examine all available relevant information, e.g., insurance company and trade association data and information from suppliers or exposure data collected from similar operations.

(e) The employer may also use previously-conducted sampling including area monitoring. The employer must make a determination relevant to each operation although this need not be on a separate piece of paper.

(f) If the employer can demonstrate conclusively that no employee is exposed above the action level or the STEL through the use of objective data, the employer need proceed no further on employee exposure monitoring until such time that conditions have changed and the determination is no longer valid.

(g) If the employer cannot determine that employee exposure is less than the action level and the STEL, employee exposure monitoring will have to be conducted.

(6) Workplace material survey.

(a) The primary purpose of a survey of raw material is to determine if formaldehyde is being used in the work environment and if so, the conditions under which formaldehyde is being used.

(b) The first step is to tabulate all situations where formaldehyde is used in a manner such that it may be released into the workplace atmosphere or contaminate the skin. This information should be available through analysis of company records and information on the MSDSs available through provisions of this standard and the hazard communication standard.

(c) If there is an indication from materials handling records and accompanying MSDSs that formaldehyde is being used in the following types of processes or work operations, there may be a potential for releasing formaldehyde into the workplace atmosphere:

(i) Any operation that involves grinding, sanding, sawing, cutting, crushing, screening, sieving, or any other manipulation of material that generates formaldehyde-bearing dust.

(ii) Any processes where there have been employee complaints or symptoms indicative of exposure to formaldehyde.

(iii) Any liquid or spray process involving formaldehyde.

(iv) Any process that uses formaldehyde in preserved tissue.

(v) Any process that involves the heating of a formaldehyde-bearing resin.

Processes and work operations that use formaldehyde in these manners will probably require further investigation at the worksite to determine the extent of employee monitoring that should be conducted.

(7) Workplace observations.

(a) To this point, the only intention has been to provide an indication as to the existence of potentially exposed employees. With this information, a visit to the workplace is needed to observe work operations, to identify potential health hazards, and to determine whether any employees may be exposed to hazardous concentrations of formaldehyde.

(b) In many circumstances, sources of formaldehyde can be identified through the sense of smell. However, this method of detection should be used with caution because of olfactory fatigue.

(c) Employee location in relation to source of formaldehyde is important in determining if an employee may be significantly exposed to formaldehyde. In most instances, the closer a worker is to the source, the higher the probability that a significant exposure will occur.

Other characteristics should be considered. Certain high temperature operations give rise to higher evaporation rates. Locations of open doors and windows provide natural ventilation that tend to dilute formaldehyde emissions. General room ventilation also provides a measure of control.

(8) Calculation of potential exposure concentrations.

(a) By knowing the ventilation rate in a workplace and the quantity of formaldehyde generated, the employer may be able to determine by calculation if the PELs might be exceeded.

(b) To account for poor mixing of formaldehyde into the entire room, locations of fans and proximity of employees to the work operation, the employer must include a safety factor.

(c) If an employee is relatively close to a source, particularly if he or she is located downwind, a safety factor of one hundred may be necessary.

(d) For other situations, a factor of ten may be acceptable. If the employer can demonstrate through such calculations that employee exposure does not exceed the action level or the STEL, the employer may use this information as objective data to demonstrate compliance with the standard.

(9) Sampling strategy.

(a) Once the employer determines that there is a possibility of substantial employee exposure to formaldehyde, the employer is obligated to measure employee exposure.

(b) The next step is selection of a maximum risk employee. When there are different processes where employees may be exposed to formaldehyde, a maximum risk employee should be selected for each work operation.

(c) Selection of the maximum risk employee requires professional judgment. The best procedure for selecting the maximum risk employee is to observe employees and select the person closest to the source of formaldehyde. Employee mobility may affect this selection; e.g., if the closest employee is mobile in his tasks, he may not be the maximum risk employee. Air movement patterns and differences in work habits will also affect selection of the maximum risk employee.

(d) When many employees perform essentially the same task, a maximum risk employee cannot be selected. In this circumstance, it is necessary to resort to random sampling of the group of workers. The objective is to select a subgroup of adequate size so that there is a high probability that the random sample will contain at least one worker with high exposure if one exists. The number of persons in the group influences the number that need to be sampled to ensure that at least one individual from the highest ten percent exposure group is contained in the sample. For example, to have ninety percent confidence in the results, if the group size is ten, nine should be sampled; for fifty, only eighteen need to be sampled.

(e) If measurement shows exposure to formaldehyde at or above the action level or the STEL, the employer needs to identify all other employees who may be exposed at or above the action level or STEL and measure or otherwise accurately characterize the exposure of these employees.

(f) Whether representative monitoring or random sampling are conducted, the purpose remains the same to determine if the exposure of any employee is above the action level. If the exposure of the most exposed employee is less than the action level and the STEL, regardless of how the employee is identified, then it is reasonable to assume that measurements of exposure of the other employees in that operation would be below the action level and the STEL.

(10) Exposure measurements.

(a) There is no "best" measurement strategy for all situations. Some elements to consider in developing a strategy are:

(i) Availability and cost of sampling equipment;

(ii) Availability and cost of analytic facilities;

(iii) Availability and cost of personnel to take samples;

(iv) Location of employees and work operations;

(v) Intraday and interday variations in the process;

(vi) Precision and accuracy of sampling and analytic methods; and

(vii) Number of samples needed.

(b) Samples taken for determining compliance with the STEL differ from those that measure the TWA concentration in important ways. STEL samples are best taken in a nonrandom fashion using all available knowledge relating to the area, the individual, and the process to obtain samples during periods of maximum expected concentrations. At least three measurements on a shift are generally needed to spot gross errors or mistakes; however, only the highest value represents the STEL.

(c) If an operation remains constant throughout the workshift, a much greater number of samples would need to be taken over the thirty-two discrete nonoverlapping periods in an 8-hour workshift to verify compliance with a STEL. If employee exposure is truly uniform throughout the workshift, however, an employer in compliance with the 1 ppm TWA would be in compliance with the 2 ppm STEL, and this determination can probably be made using objective data.

(11) Need to repeat the monitoring strategy.

(a) Interday and intraday fluctuations in employee exposure are mostly influenced by the physical processes that generate formaldehyde and the work habits of the employee. Hence, in-plant process variations influence the employer's determination of whether or not additional controls need to be imposed. Measurements that employee exposure is low on a day that is not representative of worst conditions may not provide sufficient information to determine whether or not additional engineering controls should be installed to achieve the PELs.

(b) The person responsible for conducting sampling must be aware of systematic changes which will negate the validity of the sampling results. Systematic changes in formaldehyde exposure concentration for an employee can occur due to:

(i) The employee changing patterns of movement in the workplace;

(ii) Closing of plant doors and windows;

(iii) Changes in ventilation from season to season;

(iv) Decreases in ventilation efficiency or abrupt failure of engineering control equipment; and

(v) Changes in the production process or work habits of the employee.

(c) Any of these changes, if they may result in additional exposure that reaches the next level of action (i.e., 0.5 or 1.0 ppm as an 8-hour average or 2 ppm over fifteen minutes) require the employer to perform additional monitoring to reassess employee exposure.

(d) A number of methods are suitable for measuring employee exposure to formaldehyde or for characterizing emissions within the worksite. The preamble to this standard describes some methods that have been widely

used or subjected to validation testing. A detailed analytical procedure derived from the WISHA Method ALDE-1 for acrolein and formaldehyde is presented below for informational purposes.

(e) Inclusion of WISHA's method in this appendix in no way implies that it is the only acceptable way to measure employee exposure to formaldehyde. Other methods that are free from significant interferences and that can determine formaldehyde at the permissible exposure limits within ± 25 percent of the "true" value at the ninety-five percent confidence level are also acceptable. Where applicable, the method should also be capable of measuring formaldehyde at the action level to ± 35 percent of the "true" value with a ninety-five percent confidence level. WISHA encourages employers to choose methods that will be best for their individual needs. The employer must exercise caution, however, in choosing an appropriate method since some techniques suffer from interferences that are likely to be present in workplaces of certain industry sectors where formaldehyde is used.

(12) WISHA's analytical laboratory method.

Method No: ALDE-1.

Matrix: Air.

(a) Target concentration: 1 ppm (1.2 mg/m³).

(b) Procedures: Air samples are collected by drawing known volumes of air through sampling tubes containing XAD-2 adsorbent which have been coated with 2-(hydroxymethyl) piperidine. The samples are desorbed with toluene and then analyzed by gas chromatography using a nitrogen selective detector.

(c) Recommended sampling rate and air volumes: 0.1 L/min and 24 L.

(d) Reliable quantitation limit: 16 ppb (20 ug/m³).

(e) Standard error of estimate at the target concentration: 7.3%.

(f) Status of the method: A sampling and analytical method that has been subjected to the established evaluation procedures of the organic methods evaluation branch.

(13) Date: March, 1985.

(a) General discussion.

(i) Background: The current WISHA method for collecting acrolein vapor recommends the use of activated 13X molecular sieves. The samples must be stored in an ice bath during and after sampling and also they must be analyzed within forty-eight hours of collection. The current WISHA method for collecting formaldehyde vapor recommends the use of bubblers containing ten percent methanol in water as the trapping solution.

This work was undertaken to resolve the sample stability problems associated with acrolein and also to eliminate the need to use bubblers to sample formaldehyde. A goal of this work was to develop and/or to evaluate a common sampling and analytical procedure for acrolein and formaldehyde.

NIOSH has developed independent methodologies for acrolein and formaldehyde which recommend the use of reagent-coated adsorbent tubes to collect the aldehydes as stable derivatives. The formaldehyde sampling tubes contain Chromosorb 102 adsorbent coated with N-

benzylethanolamine (BEA) which reacts with formaldehyde vapor to form a stable oxazolidine compound. The acrolein sampling tubes contain XAD-2 adsorbent coated with 2-(hydroxymethyl) to piperidine (2-HMP) which reacts with acrolein vapor to form a different, stable oxazolidine derivative. Acrolein does not appear to react with BEA to give a suitable reaction product. Therefore, the formaldehyde procedure cannot provide a common method for both aldehydes. However, formaldehyde does react with 2-HMP to form a very suitable reaction product. It is the quantitative reaction of acrolein and formaldehyde with 2-HMP that provides the basis for this evaluation.

This sampling and analytical procedure is very similar to the method recommended by NIOSH for acrolein. Some changes in the NIOSH methodology were necessary to permit the simultaneous determination of both aldehydes and also to accommodate WISHA laboratory equipment and analytical techniques.

(ii) Limit-defining parameters: The analyte air concentrations reported in this method are based on the recommended air volume for each analyte collected separately and a desorption volume of 1 mL. The amounts are presented as acrolein and/or formaldehyde, even though the derivatives are the actual species analyzed.

(A) Detection limits of the analytical procedure: The detection limit of the analytical procedure was 386 pg per injection for formaldehyde. This was the amount of analyte which gave a peak whose height was about five times the height of the peak given by the residual formaldehyde derivative in a typical blank front section of the recommended sampling tube.

(B) Detection limits of the overall procedure: The detection limits of the overall procedure were 482 ng per sample (16 ppb or 20 ug/m³ for formaldehyde). This was the amount of analyte spiked on the sampling device which allowed recoveries approximately equal to the detection limit of the analytical procedure.

(C) Reliable quantitation limits: The reliable quantitation limit was 482 ng per sample (16 ppb or 20 ug/m³) for formaldehyde. These were the smallest amounts of analyte which could be quantitated within the limits of a recovery of at least seventy-five percent and a precision (± 1.96 SD) of $\pm 25\%$ or better.

The reliable quantitation limit and detection limits reported in the method are based upon optimization of the instrument for the smallest possible amount of analyte. When the target concentration of an analyte is exceptionally higher than these limits, they may not be attainable at the routine operating parameters.

(D) Sensitivity: The sensitivity of the analytical procedure over concentration ranges representing 0.4 to 2 times the target concentration, based on the recommended air volumes, was seven thousand five hundred eighty-nine area units per ug/mL for formaldehyde. This value was determined from the slope of the calibration curve. The sensitivity may vary with the particular instrument used in the analysis.

(E) Recovery: The recovery of formaldehyde from samples used in an eighteen-day storage test remained above ninety-two percent when the samples were stored

at ambient temperature. These values were determined from regression lines which were calculated from the storage data. The recovery of the analyte from the collection device must be at least seventy-five percent following storage.

(F) Precision (analytical method only): The pooled coefficient of variation obtained from replicate determinations of analytical standards over the range of 0.4 to 2 times the target concentration was 0.0052 for formaldehyde ((d)(C)(iii) of this subsection).

(G) Precision (overall procedure): The precision at the ninety-five percent confidence level for the ambient temperature storage tests was $\pm 14.3\%$ for formaldehyde. These values each include an additional $\pm 5\%$ for sampling error. The overall procedure must provide results at the target concentrations that are $\pm 25\%$ at the ninety-five percent confidence level.

(H) Reproducibility: Samples collected from controlled test atmospheres and a draft copy of this procedure were given to a chemist unassociated with this evaluation. The formaldehyde samples were analyzed following fifteen days storage. The average recovery was 96.3% and the standard deviation was 1.7%.

(iii) Advantages:

(A) The sampling and analytical procedures permit the simultaneous determination of acrolein and formaldehyde.

(B) Samples are stable following storage at ambient temperature for at least eighteen days.

(iv) Disadvantages: None.

(b) Sampling procedure.

(i) Apparatus:

(A) Samples are collected by use of a personal sampling pump that can be calibrated to within $\pm 5\%$ of the recommended 0.1 L/min sampling rate with the sampling tube in line.

(B) Samples are collected with laboratory prepared sampling tubes. The sampling tube is constructed of silane treated glass and is about 8-cm long. The ID is 4 mm and the OD is 6 mm. One end of the tube is tapered so that a glass wool end plug will hold the contents of the tube in place during sampling. The other end of the sampling tube is open to its full 4-mm ID to facilitate packing of the tube. Both ends of the tube are fire-polished for safety. The tube is packed with a 75-mg backup section, located nearest the tapered end and a 150-mg sampling section of pretreated XAD-2 adsorbent which has been coated with 2-HMP. The two sections of coated adsorbent are separated and retained with small plugs of silanized glass wool. Following packing, the sampling tubes are sealed with two 7/32 inch OD plastic end caps. Instructions for the pretreatment and the coating of XAD-2 adsorbent are presented in (d) of this subsection.

(C) Sampling tubes, similar to those recommended in this method, are marketed by Supelco, Inc. These tubes were not available when this work was initiated; therefore, they were not evaluated.

(ii) Reagents: None required.

(iii) Technique:

(A) Properly label the sampling tube before sampling and then remove the plastic end caps.

(B) Attach the sampling tube to the pump using a section of flexible plastic tubing such that the large, front section of the sampling tube is exposed directly to the atmosphere. Do not place any tubing ahead of the sampling tube. The sampling tube should be attached in the worker's breathing zone in a vertical manner such that it does not impede work performance.

(C) After sampling for the appropriate time, remove the sampling tube from the pump and then seal the tube with plastic end caps.

(D) Include at least one blank for each sampling set. The blank should be handled in the same manner as the samples with the exception that air is not drawn through it.

(E) List any potential interferences on the sample data sheet.

(iv) Breakthrough:

(A) Breakthrough was defined as the relative amount of analyte found on a backup sample in relation to the total amount of analyte collected on the sampling train.

(B) For formaldehyde collected from test atmospheres containing six times the PEL, the average five percent breakthrough air volume was 41 L. The sampling rate was 0.1 L/min and the average mass of formaldehyde collected was 250 ug.

(v) Desorption efficiency: No desorption efficiency corrections are necessary to compute air sample results because analytical standards are prepared using coated adsorbent. Desorption efficiencies were determined, however, to investigate the recoveries of the analytes from the sampling device. The average recovery over the range of 0.4 to 2 times the target concentration, based on the recommended air volumes, was 96.2% for formaldehyde. Desorption efficiencies were essentially constant over the ranges studied.

(vi) Recommended air volume and sampling rate:

(A) The recommended air volume for formaldehyde is 24 L.

(B) The recommended sampling rate is 0.1 L/min.

(vii) Interferences:

(A) Any collected substance that is capable of reacting with 2-HMP and thereby depleting the derivatizing agent is a potential interference. Chemicals which contain a carbonyl group, such as acetone, may be capable of reacting with 2-HMP.

(b) There are no other known interferences to the sampling method.

(viii) Safety precautions:

(A) Attach the sampling equipment to the worker in such a manner that it will not interfere with work performance or safety.

(B) Follow all safety practices that apply to the work area being sampled.

(c) Analytical procedure.

(i) Apparatus:

(A) A gas chromatograph (GC), equipped with a nitrogen selective detector.

(B) A GC column capable of resolving the analytes from any interference. A 6 ft x 1/4 in OD (2mm ID)

glass GC column containing 10% UCON 50-HB-5100 + 2% KOH on 80/100 mesh Chromosorb W-AW was used for the evaluation. Injections were performed on-column.

(C) Vials, glass 2-mL with Teflon-lined caps.

(D) Volumetric flasks, pipets, and syringes for preparing standards, making dilutions, and performing injections.

(ii) Reagents:

(A) Toluene and dimethylformamide. Burdick and Jackson solvents were used in this evaluation.

(B) Helium, hydrogen, and air, GC grade.

(C) Formaldehyde, thirty-seven percent by weight, in water. Aldrich Chemical, ACS Reagent Grade formaldehyde was used in this evaluation.

(D) Ambrlite XAD-2 adsorbent coated with 2-(hydroxymethyl) piperidine (2-HMP), 10% by weight ((d) of this subsection).

(E) Desorbing solution with internal standard. This solution was prepared by adding 20 μ L of dimethylformamide to 100 mL of toluene.

(iii) Standard preparation:

(A) Formaldehyde: Prepare stock standards by diluting known volumes of thirty-seven percent formaldehyde solution with methanol. A procedure to determine the formaldehyde content of these standards is presented in (d) of this subsection. A standard containing 7.7 mg/mL formaldehyde was prepared by diluting 1 mL of the thirty-seven percent reagent to 50 mL with methanol.

(B) It is recommended that analytical standards be prepared about sixteen hours before the air samples are to be analyzed in order to ensure the complete reaction of the analytes with 2-HMP. However, rate studies have shown the reaction to be greater than ninety-five percent complete after four hours. Therefore, one or two standards can be analyzed after this reduced time if sample results are outside the concentration range of the prepared standards.

(C) Place 150-mg portions of coated XAD-2 adsorbent, from the same lot number as used to collect the air samples, into each of several glass 2-mL vials. Seal each vial with a Teflon-lined cap.

(D) Prepare fresh analytical standards each day by injecting appropriate amounts of the diluted analyte directly onto 150-mg portions of coated adsorbent. It is permissible to inject both acrolein and formaldehyde on the same adsorbent portion. Allow the standards to stand at room temperature. A standard, approximately the target levels, was prepared by injecting 11 μ L of the acrolein and 12 μ L of the formaldehyde stock standards onto a single coated XAD-2 adsorbent portion.

(E) Prepare a sufficient number of standards to generate the calibration curves. Analytical standard concentrations should bracket sample concentrations. Thus, if samples are not in the concentration range of the prepared standards, additional standards must be prepared to determine detector response.

(F) Desorb the standards in the same manner as the samples following the sixteen-hour reaction time.

(iv) Sample preparation:

(A) Transfer the 150-mg section of the sampling tube to a 2-mL vial. Place the 75-mg section in a separate vial. If the glass wool plugs contain a significant number of adsorbent beads, place them with the appropriate sampling tube section. Discard the glass wool plugs if they do not contain a significant number of adsorbent beads.

(B) Add 1 mL of desorbing solution to each vial.

(C) Seal the vials with Teflon-lined caps and then allow them to desorb for one hour. Shake the vials by hand with vigorous force several times during the desorption time.

(D) Save the used sampling tubes to be cleaned and recycled.

(v) Analysis:

(A) GC conditions.

Column temperature:

Bi-level temperature program.

First level: 100°C to 140°C at 4°C/min following completion of the first level.

Second level: 140°C to 180°C at 20°C/min following completion of the first level.

Isothermal period: Hold column at 180°C until the recorder pen returns to baseline (usually about twenty-five minutes after injection).

Injector temperature: 180°C.

Helium flow rate: 30 mL/min (detector response will be reduced if nitrogen is substituted for helium carrier gas).

Injection volume: 51 0.8 μ L.

GC column: Six-ft x 1/4-in OD (2 mm ID) glass GC column containing 10% UCON 50-HB-5100N ZG651+512% KOH on 80/100 Chromosorb W-AW.

NPD conditions:

Hydrogen flow rate: 3 mL/min.

Air flow rate: 50 mL/min.

Detector temperature: 275 5151C.

(B) Use a suitable method, such as electronic integration, to measure detector response.

(C) Use an internal standard method to prepare the calibration curve with several standard solutions of different concentrations. Prepare the calibration curve daily. Program the integrator to report results in μ g/mL.

(D) Bracket sample concentrations with standards.

(vi) Interferences (analytical).

(A) Any compound with the same general retention time as the analytes and which also gives a detector response is a potential interference. Possible interferences should be reported to the laboratory with submitted samples by the industrial hygienist.

(B) GC parameters (temperature, column, etc.), may be changed to circumvent interferences.

(C) A useful means of structure designation is GC/MS. It is recommended this procedure be used to confirm samples whenever possible.

(D) The coated adsorbent usually contains a very small amount of residual formaldehyde derivative.

(vii) Calculations:

(A) Results are obtained by use of calibration curves. Calibration curves are prepared by plotting detector response against concentration for each standard. The best line through the data points is determined by curve fitting.

(B) The concentration, in ug/mL, for a particular sample is determined by comparing its detector response to the calibration curve. If either of the analytes is found on the backup section, it is added to the amount found on the front section. Blank corrections should be performed before adding the results together.

(C) The acrolein and/or formaldehyde air concentration can be expressed using the following equation:

$$\text{Mg/m}^3 = (\text{A})(\text{B})/\text{C}$$

where A=ug/mL from 3.7.2, B=desorption volume, and C=L of air sampled.

No desorption efficiency corrections are required.

(D) The following equation can be used to convert results in mg/m³ to ppm.

$$\text{ppm} = (\text{mg/m}^3)(24.45)/\text{MW}$$

where mg/m³=result from 3.7.3, 24.45=molar volume of an ideal gas at 760 mm Hg and 25 °C, MW=molecular weight (Formaldehyde=30.0).

(d) Backup data.

(i) Backup data on detection limits, reliable quantitation limits, sensitivity and precision of the analytical method, breakthrough, desorption efficiency, storage, reproducibility, and generation of test atmospheres are available in OSHA Method 52, developed by the Organics Methods Evaluation Branch, OSHA Analytical Laboratory, Salt Lake City, Utah.

(ii) Procedure to coat XAD-2 adsorbent with 2-HMP:

(A) Apparatus: Soxhlet extraction apparatus, rotary evaporation apparatus, vacuum dessicator, 1-L vacuum flask, 1-L round-bottomed evaporative flask, 1-L Erlenmeyer flask, 250-mL Buchner funnel with a coarse fritted disc, etc.

(B) Reagents:

(I) Methanol, isooctane, and toluene.

(II) (Hydroxymethyl) piperidine.

(III) Amberlite XAD-2 nonionic polymeric adsorbent, twenty to sixty mesh, Aldrich Chemical XAD-2 was used in this evaluation.

(C) Procedure: Weigh 125 g of crude XAD-2 adsorbent into a 1-L Erlenmeyer flask. Add about 200 mL of water to the flask and then swirl the mixture to wash the adsorbent. Discard any adsorbent that floats to the top of the water and then filter the mixture using a fritted Buchner funnel. Air dry the adsorbent for two minutes. Transfer the adsorbent back to the Erlenmeyer flask and then add about 200 mL of methanol to the flask. Swirl and then filter the mixture as before. Transfer the washed adsorbent back to the Erlenmeyer flask and then add about 200 mL of methanol to the flask. Swirl and then filter the mixture as before. Transfer the washed adsorbent to a 1-L round-bottomed evaporative flask, add 13 g of 2-HMP and then 200 mL of methanol, swirl the mixture and then allow it to stand for one hour. Remove the methanol at about 40°C and

reduced pressure using a rotary evaporation apparatus. Transfer the coated adsorbent to a suitable container and store it in a vacuum desiccator at room temperature overnight. Transfer the coated adsorbent to a Soxhlet extractor and then extract the material with toluene for about twenty-four hours. Discard the contaminated toluene, add methanol in its place and then continue the Soxhlet extraction for an additional four hours. Transfer the adsorbent to a weighted 1-L round-bottom evaporative flask and remove the methanol using the rotary evaporation apparatus. Determine the weight of the adsorbent and then add an amount of 2-HMP, which is ten percent by weight of the adsorbent. Add 200 mL of methanol and then swirl the mixture. Allow the mixture to stand for one hour. Remove the methanol by rotary evaporation. Transfer the coated adsorbent to a suitable container and store it in a vacuum desiccator until all traces of solvents are gone. Typically, this will take two to three days. The coated adsorbent should be protected from contamination. XAD-2 adsorbent treated in this manner will probably not contain residual acrolein derivative. However, this adsorbent will often contain residual formaldehyde derivative levels of about 0.1 ug per 150 mg of adsorbent. If the blank values for a batch of coated adsorbent are too high, then the batch should be returned to the Soxhlet extractor, extracted with toluene again and then recoated. This process can be repeated until the desired blank levels are attained.

The coated adsorbent is now ready to be packed into sampling tubes. The sampling tubes should be stored in a sealed container to prevent contamination. Sampling tubes should be stored in the dark at room temperature. The sampling tubes should be segregated by coated adsorbent lot number. A sufficient amount of each lot number of coated adsorbent should be retained to prepare analytical standards for use with air samples from that lot number.

(iii) A procedure to determine formaldehyde by acid titration: Standardize the 0.1 N HCl solution using sodium carbonate and methyl orange indicator.

Place 50 mL of 0.1 M sodium sulfite and three drops of thymophthalein indicator into a 250-mL Erlenmeyer flask. Titrate the contents of the flask to a colorless endpoint with 0.1 N HCl (usually one or two drops is sufficient). Transfer 10 mL of the formaldehyde/methanol solution ((b)(iii)(A) of this subsection) into the same flask and titrate the mixture with 0.1 N HCl, again, to a colorless endpoint. The formaldehyde concentration of the standard may be calculated by the following equation:

$$\text{Formaldehyde, mg/mL} = \frac{\text{acid titer} \times \text{acid normality} \times 30.0}{\text{mL of Sample}}$$

This method is based on the quantitative liberation of sodium hydroxide when formaldehyde reacts with sodium sulfite to form the formaldehyde-bisulfite addition product. The volume of sample may be varied depending on the formaldehyde content but the solution to be titrated must contain excess sodium sulfite. Formaldehyde solutions containing substantial amounts of acid or base must be neutralized before analysis.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-07544, filed 10/6/88, effective 11/7/88.]

WAC 296-62-07546 Appendix C medical surveillance—Formaldehyde. (1) Health hazards. The occupational health hazards of formaldehyde are primarily due to its toxic effects after inhalation, after direct contact with the skin or eyes by formaldehyde in liquid or vapor form, and after ingestion.

(2) Toxicology.

(a) Acute effects of exposure.

(i) Inhalation (breathing): Formaldehyde is highly irritating to the upper airways. The concentration of formaldehyde that is immediately dangerous to life and health is 100 ppm. Concentrations above 50 ppm can cause severe pulmonary reactions within minutes. These include pulmonary edema, pneumonia, and bronchial irritation which can result in death. Concentrations above 5 ppm readily cause lower airway irritation characterized by cough, chest tightness, and wheezing. There is some controversy regarding whether formaldehyde gas is a pulmonary sensitizer which can cause occupational asthma in a previously normal individual. Formaldehyde can produce symptoms of bronchial asthma in humans. The mechanism may be either sensitization of the individual by exposure to formaldehyde or direct irritation by formaldehyde in persons with preexisting asthma. Upper airway irritation is the most common respiratory effect reported by workers and can occur over a wide range of concentrations, most frequently above 1 ppm. However, airway irritation has occurred in some workers with exposures to formaldehyde as low as 0.1 ppm. Symptoms of upper airway irritation include dry or sore throat, itching and burning sensations of the nose, and nasal congestion. Tolerance to this level of exposure may develop within one to two hours. This tolerance can permit workers remaining in an environment of gradually increasing formaldehyde concentrations to be unaware of their increasingly hazardous exposure.

(ii) Eye contact: Concentrations of formaldehyde between 0.05 ppm and 0.5 ppm produce a sensation of irritation in the eyes with burning, itching, redness, and tearing. Increased rate of blinking and eye closure generally protects the eye from damage at these low levels, but these protective mechanisms may interfere with some workers' work abilities. Tolerance can occur in workers continuously exposed to concentrations of formaldehyde in this range. Accidental splash injuries of human eyes to aqueous solutions of formaldehyde (formalin) have resulted in a wide range of ocular injuries including corneal opacities and blindness. The severity of the reactions have been directly dependent on the concentration of formaldehyde in solution and the amount of time lapsed before emergency and medical intervention.

(iii) Skin contact: Exposure to formaldehyde solutions can cause irritation of the skin and allergic contact dermatitis. These skin diseases and disorders can occur at levels well below those encountered by many formaldehyde workers. Symptoms include erythema, edema, and

vesiculation or hives. Exposure to liquid formalin or formaldehyde vapor can provoke skin reactions in sensitized individuals even when airborne concentrations of formaldehyde are well below 1 ppm.

(iv) Ingestion: Ingestion of as little as 30 ml of a thirty-seven percent solution of formaldehyde (formalin) can result in death. Gastrointestinal toxicity after ingestion is most severe in the stomach and results in symptoms which can include nausea, vomiting, and severe abdominal pain. Diverse damage to other organ systems including the liver, kidney, spleen, pancreas, brain, and central nervous systems can occur from the acute response to ingestion of formaldehyde.

(b) Chronic effects of exposure. Long-term exposure to formaldehyde has been shown to be associated with an increased risk of cancer of the nose and accessory sinuses, nasopharyngeal and oropharyngeal cancer, and lung cancer in humans. Animal experiments provide conclusive evidence of a causal relationship between nasal cancer in rats and formaldehyde exposure. Concordant evidence of carcinogenicity includes DNA binding, genotoxicity in short-term tests, and cytotoxic changes in the cells of the target organ suggesting both preneoplastic changes and a dose-rate effect. Formaldehyde is a complete carcinogen and appears to exert an effect on at least two stages of the carcinogenic process.

(3) Surveillance considerations.

(a) History.

(i) Medical and occupational history: Along with its acute irritative effects, formaldehyde can cause allergic sensitization and cancer. One of the goals of the work history should be to elicit information on any prior or additional exposure to formaldehyde in either the occupational or the nonoccupational setting.

(ii) Respiratory history: As noted above, formaldehyde has recognized properties as an airway irritant and has been reported by some authors as a cause of occupational asthma. In addition, formaldehyde has been associated with cancer of the entire respiratory system of humans. For these reasons, it is appropriate to include a comprehensive review of the respiratory system in the medical history. Components of this history might include questions regarding dyspnea on exertion, shortness of breath, chronic airway complaints, hyperreactive airway disease, rhinitis, bronchitis, bronchiolitis, asthma, emphysema, respiratory allergic reaction, or other pre-existing pulmonary disease.

In addition, generalized airway hypersensitivity can result from exposures to a single sensitizing agent. The examiner should, therefore, elicit any prior history of exposure to pulmonary irritants, and any short-term or long-term effects of that exposure.

Smoking is known to decrease mucociliary clearance of materials deposited during respiration in the nose and upper airways. This may increase a worker's exposure to inhaled materials such as formaldehyde vapor. In addition, smoking is a potential confounding factor in the investigation of any chronic respiratory disease, including cancer. For these reasons, a complete smoking history should be obtained.

(iii) Skin disorders: Because of the dermal irritant and sensitizing effects of formaldehyde, a history of skin disorders should be obtained. Such a history might include the existence of skin irritation, previously documented skin sensitivity, and other dermatologic disorders. Previous exposure to formaldehyde and other dermal sensitizers should be recorded.

(iv) History of atopic or allergic diseases: Since formaldehyde can cause allergic sensitization of the skin and airways, it might be useful to identify individuals with prior allergen sensitization. A history of atopic disease and allergies to formaldehyde or any other substances should also be obtained. It is not definitely known at this time whether atopic diseases and allergies to formaldehyde or any other substances should also be obtained. Also it is not definitely known at this time whether atopic individuals have a greater propensity to develop formaldehyde sensitivity than the general population, but identification of these individuals may be useful for ongoing surveillance.

(v) Use of disease questionnaires: Comparison of the results from previous years with present results provides the best method for detecting a general deterioration in health when toxic signs and symptoms are measured subjectively. In this way recall bias does not affect the results of the analysis. Consequently, WISHA has determined that the findings of the medical and work histories should be kept in a standardized form for comparison of the year-to-year results.

(b) Physical examination.

(i) Mucosa of eyes and airways: Because of the irritant effects of formaldehyde, the examining physician should be alert to evidence of this irritation. A speculum examination of the nasal mucosa may be helpful in assessing possible irritation and cytotoxic changes, as may be indirect inspection of the posterior pharynx by mirror.

(ii) Pulmonary system: A conventional respiratory examination, including inspection of the thorax and auscultation and percussion of the lung fields should be performed as part of the periodic medical examination. Although routine pulmonary function testing is only required by the standard once every year for persons who are exposed over the TWA concentration limit, these tests have an obvious value in investigating possible respiratory dysfunction and should be used wherever deemed appropriate by the physician. In cases of alleged formaldehyde-induced airway disease, other possible causes of pulmonary dysfunction (including exposures to other substances) should be ruled out. A chest radiograph may be useful in these circumstances. In cases of suspected airway hypersensitivity or allergy, it may be appropriate to use bronchial challenge testing with formaldehyde or methacholine to determine the nature of the disorder. Such testing should be performed by or under the supervision of a physician experienced in the procedures involved.

(iii) Skin: The physician should be alert to evidence of dermal irritation of sensitization, including reddening and inflammation, urticaria, blistering, scaling, formation of skin fissures, or other symptoms. Since the integrity of the skin barrier is compromised by other dermal

diseases, the presence of such disease should be noted. Skin sensitivity testing carries with it some risk of inducing sensitivity, and therefore, skin testing for formaldehyde sensitivity should not be used as a routine screening test. Sensitivity testing may be indicated in the investigation of a suspected existing sensitivity. Guidelines for such testing have been prepared by the North American Contact Dermatitis Group.

(4) Additional examinations or tests. The physician may deem it necessary to perform other medical examinations or tests as indicated. The standard provides a mechanism whereby these additional investigations are covered under the standard for occupational exposure to formaldehyde.

(5) Emergencies. The examination of workers exposed in an emergency should be directed at the organ systems most likely to be affected. Much of the content of the examination will be similar to the periodic examination unless the patient has received a severe acute exposure requiring immediate attention to prevent serious consequences. If a severe overexposure requiring medical intervention or hospitalization has occurred, the physician must be alert to the possibility of delayed symptoms. Followup nonroutine examinations may be necessary to assure the patient's well-being.

(6) Employer obligations. The employer is required to provide the physician with the following information: A copy of this standard and appendices A, C, D, and E; a description of the affected employee's duties as they relate to his or her exposure concentration; an estimate of the employee's exposure including duration (e.g., fifteen hr./wk., three eight-hour shifts, full-time); a description of any personal protective equipment, including respirators, used by the employee; and the results of any previous medical determinations for the affected employee related to formaldehyde exposure to the extent that this information is within the employer's control.

(7) Physician's obligations. The standard requires the employer to obtain a written statement from the physician. This statement must contain the physician's opinion as to whether the employee has any medical condition which would place him or her at increased risk of impaired health from exposure to formaldehyde or use of respirators, as appropriate. The physician must also state his opinion regarding any restrictions that should be placed on the employee's exposure to formaldehyde or upon the use of protective clothing or equipment such as respirators. If the employee wears a respirator as a result of his or her exposure to formaldehyde, the physician's opinion must also contain a statement regarding the suitability of the employee to wear the type of respirator assigned. Finally, the physician must inform the employer that the employee has been told the results of the medical examination and of any medical conditions which require further explanation or treatment. This written opinion is not to contain any information on specific findings or diagnoses unrelated to occupational exposure to formaldehyde.

The purpose in requiring the examining physician to supply the employer with a written opinion is to provide the employer with a medical basis to assist the employer

in placing employees initially, in assuring that their health is not being impaired by formaldehyde, and to assess the employee's ability to use any required protective equipment.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-07546, filed 10/6/88, effective 11/7/88.]

WAC 296-62-07548 Appendix D--Nonmandatory medical disease questionnaire. (1) Identification.

- (a) Plant name:
- (b) Date:
- (c) Employee name:
- (d) Social Security number:
- (e) Job title:
- (f) Birthdate:
- (g) Age:
- (h) Sex:
- (i) Height:
- (j) Weight:
- (2) Medical history.
- (a) Have you ever been in the hospital as a patient?
Yes No
If yes, what kind of problem were you having?
- (b) Have you ever had any kind of operation?
Yes No
If yes, what kind?
- (c) Do you take any kind of medicine regularly?
Yes No
If yes, what kind?
- (d) Are you allergic to any drugs, foods, or chemicals?
Yes No
If yes, what kind of allergy is it?

What causes the allergy?
- (e) Have you ever been told that you have asthma, hayfever, or sinusitis?
Yes No
- (f) Have you ever been told that you have emphysema, bronchitis, or any other respiratory problems?
Yes No
- (g) Have you ever been told you had hepatitis?
Yes No
- (h) Have you ever been told that you have cirrhosis?
Yes No
- (i) Have you ever been told that you had cancer?
Yes No

- (j) Have you ever had arthritis or joint pain?
Yes No
- (k) Have you ever been told that you had high blood pressure?
Yes No
- (l) Have you ever had a heart attack or heart trouble?
Yes No
- (3) Medical history update.
- (a) Have you been in the hospital as a patient any time within the past year?
Yes No
If so, for what condition?
- (b) Have you been under the care of a physician during the past year?
Yes No
If so, for what condition?
- (c) Is there any change in your breathing since last year?
Yes No
(i) Better?
(ii) Worse?
(iii) No change?
If change, do you know why?
- (d) Is your general health different this year from last year?
Yes No
If different, in what way?
- (e) Have you in the past year or are you now taking any medication on a regular basis?
Yes No
(i) Name Rx
(ii) Condition being treated
- (4) Occupational history.
- (a) How long have you worked for your present employer?
- (b) What jobs have you held with this employer? Include job title and length of time in each job.
- (c) In each of these jobs, how many hours a day were you exposed to chemicals?

- (d) What chemicals have you worked with most of the time?
- (e) Have you ever noticed any type of skin rash you feel was related to your work?
Yes No
- (f) Have you ever noticed that any kind of chemical makes you cough?
Yes No
- (i) Wheeze:
Yes No
- (ii) Become short of breath or cause your chest to become tight?
Yes No
- (g) Are you exposed to any dust or chemicals at home?
Yes No
If yes, explain:
- (h) In other jobs, have you ever had exposure to:
- (i) Wood dust?
Yes No
- (ii) Nickel or chromium?
Yes No
- (iii) Silica (foundry, sand blasting)?
Yes No
- (iv) Arsenic or asbestos?
Yes No
- (v) Organic solvents?
Yes No
- (vi) Urethane foams?
Yes No
- (5) Occupational history update.
- (a) Are you working on the same job this year as you were last year?
Yes No
If not, how has your job changed?
- (b) What chemicals are you exposed to on your job?
- (c) How many hours a day are you exposed to chemicals?
- (d) Have you noticed any skin rash within the past year you feel was related to your work?
Yes No
If so, explain circumstances:
- (e) Have you noticed that any chemical makes you cough, be short of breath, or wheeze?
Yes No
If so, can you identify it?
- (6) Miscellaneous.
- (a) Do you smoke?
Yes No
If so, how much and for how long?
- (i) Pipe
- (ii) Cigars
- (iii) Cigarettes
- (b) Do you drink alcohol in any form?
Yes No
If so, how much, how long, and how often?
- (c) Do you wear glasses or contact lenses?
Yes No
- (d) Do you get any physical exercise other than that required to do your job?
Yes No
If so, explain:
- (e) Do you have any hobbies or "side jobs" that require you to use chemicals, such as furniture stripping, sand blasting, insulation or manufacture of urethane foam, furniture, etc.?
Yes No
If so, please describe, giving type of business or hobby, chemicals used and length of exposures.
- (7) Symptoms questionnaire.
- (a) Do you ever have any shortness of breath?
Yes No
- (i) If yes, do you have to rest after climbing several flights of stairs?
Yes No
- (ii) If yes, if you walk on the level with people your own age, do you walk slower than they do?
Yes No
- (iii) If yes, if you walk slower than a normal pace, do you have to limit the distance that you walk?
Yes No
- (iv) If yes, do you have to stop and rest while bathing or dressing?
Yes No
- (b) Do you cough as much as three months out of the year?
Yes No

- (i) If yes, have you had this cough for more than two years?
Yes No
- (ii) If yes, do you ever cough anything up from the chest?
Yes No
- (c) Do you ever have a feeling of smothering, unable to take a deep breath, or tightness in your chest?
Yes No
- (i) If yes, do you notice that this occurs on any particular day of the week?
Yes No
- (ii) If yes, what day of the week?
Yes No
- (iii) If yes, do you notice that this occurs at any particular place?
Yes No
- (iv) If yes, do you notice that this is worse after you have returned to work after being off for several days?
Yes No
- (d) Have you ever noticed any wheezing in your chest?
Yes No
- (i) If yes, is this only with colds or other infections?
Yes No
- (ii) Is this caused by exposure to any kind of dust or other material?
Yes No
- (iii) If yes, what kind?
- (e) Have you noticed any burning, tearing, or redness of your eyes when you are at work?
Yes No
Is so, explain circumstances:
- (f) Have you noticed any sore or burning throat or itchy or burning nose when you are at work?
Yes No
Is so, explain circumstances:
- (g) Have you noticed any stuffiness or dryness of your nose?
Yes No
- (h) Do you ever have swelling of the eyelids or face?
Yes No
- (i) Have you ever been jaundiced?
Yes No
If yes, was this accompanied by any pain?
Yes No
- (j) Have you ever had a tendency to bruise easily or bleed excessively?
Yes No
- (k) Do you have frequent headaches that are not relieved by aspirin or tylenol?
Yes No
- (i) If yes, do they occur at any particular time of the day or week?
Yes No
- (ii) If yes, when do they occur?
- (l) Do you have frequent episodes of nervousness or irritability?
Yes No
- (m) Do you tend to have trouble concentrating or remembering?
Yes No
- (n) Do you ever feel dizzy, light-headed, excessively drowsy, or like you have been drugged?
Yes No
- (o) Does your vision ever become blurred?
Yes No
- (p) Do you have numbness or tingling of the hands or feet or other parts of your body?
Yes No
- (q) Have you ever had chronic weakness or fatigue?
Yes No
- (r) Have you every had any swelling of your feet or ankles to the point where you could not wear your shoes?
Yes No
- (s) Are you bothered by heartburn or indigestion?
Yes No
- (t) Do you ever have itching, dryness, or peeling and scaling of the hands?
Yes No
- (u) Do you ever have a burning sensation in the hands, or reddening of the skin?
Yes No
- (v) Do you ever have cracking or bleeding of the skin on your hands?
Yes No
- (w) Are you under a physician's care?
Yes No
If yes, for what are you being treated?
- (x) Do you have any physical complaints today?
Yes No
If yes, explain:

- (y) Do you have other health conditions not covered by these questions?

Yes No

If yes, explain:

[Statutory Authority: Chapter 49.17 RCW, 88-21-002 (Order 88-23), § 296-62-07548, filed 10/6/88, effective 11/7/88.]

WAC 296-62-07550 Appendix E--Qualitative and quantitative fit testing procedures. FIT test protocols. Because exposure to formaldehyde can affect the employee's ability to detect common odorants, fit test results from the isoamyl acetate test must be augmented by results from either the saccharin or irritant smoke test.

(1) The employer shall include the following provisions in the fit test procedures. These provisions apply to both qualitative fit testing (QLFT) and quantitative fit testing (QNFT).

(a) The test subject shall be allowed to pick the most comfortable respirator from a selection including respirators of various sizes from different manufacturers. The selection shall include at least three sizes of elastomeric facepieces of the type of respirator that is to be tested, i.e., three sizes of half mask; or three sizes of full facepiece; and units from at least two manufacturers.

(b) Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine a comfortable fit. A mirror shall be available to assist the subject in evaluating the fit and positioning the respirator. This instruction may not constitute the subject's formal training on respirator use, as it is only a review.

(c) The test subject shall be informed that he/she is being asked to select the respirator which provides the most comfortable fit. Each respirator represents a different size and shape, and if fitted and used properly, will provide adequate protection.

(d) The test subject shall be instructed to hold each facepiece up to the face and eliminate those which obviously do not give a comfortable fit.

(e) The more comfortable facepieces are noted; the most comfortable mask is donned and worn at least five minutes to assess comfort. Assistance in assessing comfort can be given by discussing the points in (f) of this subsection. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.

(f) Assessment of comfort shall include reviewing the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator:

- (i) Position of the mask on the nose;
- (ii) Room for eye protection;
- (iii) Room to talk;
- (iv) Position of mask on face and cheeks.

(g) The following criteria shall be used to help determine the adequacy of the respirator fit:

- (i) Chin properly placed;

- (ii) Adequate strap tension, not overly tightened;

- (iii) Fit across nose bridge;

- (iv) Respirator of proper size to span distance from nose to chin;

- (v) Tendency of respirator to slip;

- (vi) Self-observation in mirror to evaluate fit and respirator position.

(h) The test subject shall conduct the negative and positive pressure fit checks as described below or in the latest edition of ANSI Z88.2. Before conducting the negative or positive pressure test, the subject shall be told to seat the mask on the face by moving the head from side to side and up and down slowly while taking in a few slow deep breaths. Another facepiece shall be selected and retested if the test subject fails the fit check tests.

(i) Positive pressure test. Close off the exhalation valve and exhale gently onto the facepiece. The face fit is considered satisfactory if a slight positive pressure can be built up inside the facepiece without any evidence of outward leakage of air at the seal. For most respirators this method of leak testing requires the wearer to first remove the exhalation valve cover before closing off the exhalation valve and then carefully replacing it after the test.

(ii) Negative pressure test. Close off the inlet opening of the canister or cartridge(s) by covering with the palm of the hand(s) or by replacing the filter seal(s), inhale gently so that the facepiece collapses slightly, and hold the breath for ten seconds. If the facepiece remains in its slightly collapsed condition and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

(i) The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface, such as stubble beard growth, beard, or long sideburns which cross the respirator sealing surface. Any type of apparel which interferes with a satisfactory fit shall be altered or removed.

(j) If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician trained in respiratory disease or pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his duties.

(k) The test subject shall be given the opportunity to wear the successfully fitted respirator for a period of two weeks. If at any time during this period the respirator becomes uncomfortable, the test subject shall be given the opportunity to select a different facepiece and to be retested.

(l) The employer shall certify that a successful fit test has been administered to the employee. The certification shall include the following information:

- (i) Name of employee;
- (ii) Type, brand, and size of respirator; and
- (iii) Date of test.

Where QNFT is used, the fit factor, strip chart, or other recording of the results of the test, shall be retained with the certification. The certification shall be maintained until the next fit test is administered.

(m) Exercise regimen. Prior to the commencement of the fit test, the test subject shall be given a description of the fit test and the test subject's responsibilities during the test procedure.

The description of the process shall include a description of the test exercises that the subject will be performing. The respirator to be tested shall be worn for at least five minutes before the start of the fit test.

(n) Test exercises. The test subject shall perform exercises, in the test environment, in the manner described below:

(i) Normal breathing. In a normal standing position, without talking, the subject shall breathe normally.

(ii) Deep breathing. In a normal standing position, the subject shall breathe slowly and deeply, taking caution so as to not hyperventilate.

(iii) Turning head side to side. Standing in place, the subject shall slowly turn his/her head from side to side between the extreme positions on each side. The head shall be held at each extreme momentarily so the subject can inhale at each side.

(iv) Moving head up and down. Standing in place, the subject shall slowly move his/her head up and down. The subject shall be instructed to inhale in the up position (i.e., when looking toward the ceiling).

(v) Talking. The subject shall talk out loud slowly and loudly enough so as to be heard clearly by the test conductor. The subject can read from a prepared text such as the Rainbow Passage, count backward from one hundred, or recite a memorized poem or song.

(vi) Grimace. The test subject shall grimace by smiling or frowning.

(vii) Bending over. The test subject shall bend at the waist as if he/she were to touch his/her toes. Jogging in place shall be substituted for this exercise in those test environments such as shroud type QNFT units which prohibit bending at the waist.

(viii) Normal breathing. Same as (n)(i) of this subsection.

(A) Each test exercise shall be performed for one minute except for the grimace exercise which shall be performed for fifteen seconds.

(B) The test subject shall be questioned by the test conductor regarding the comfort of the respirator upon completion of the protocol. If it has become uncomfortable, another model of respirator shall be tried.

(2) Qualitative fit test (QLFT) protocols.

(a) General.

(i) The employer shall assign specific individuals who shall assume full responsibility for implementing the respirator qualitative fit test program.

(ii) The employer shall ensure that persons administering QLFT are able to prepare test solutions, calibrate equipment and perform tests properly, recognize invalid tests, and assure that the equipment is in proper working order.

(iii) The employer shall assure the QLFT equipment is kept clean and well maintained so as to operate at the parameters for which it was designed.

(b) Isoamyl acetate protocol.

(i) Odor threshold screening. The odor threshold screening test, performed without wearing a respirator, is intended to determine if the individual tested can detect the odor of isoamyl acetate.

(A) Three one-liter glass jars with metal lids are required.

(B) Odor free water (e.g., distilled or spring water) at approximately 25°C shall be used for the solutions.

(C) The isoamyl acetate (IAA) (also known as isopentyl acetate) stock solution is prepared by adding 1 cc of pure IAA to 800 cc of odor free water in a one-liter jar and shaking for thirty seconds. A new solution shall be prepared at least weekly.

(D) The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well ventilated but shall not be connected to the same recirculating ventilation system.

(E) The odor test solution is prepared in a second jar by placing 0.4 cc of the stock solution into 500 cc of odor free water using a clear dropper or pipette. The solution shall be shaken for thirty seconds and allowed to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution shall be used for only one day.

(F) A test blank shall be prepared in a third jar by adding 500 cc of odor free water.

(G) The odor test and test blank jars shall be labeled 1 and 2 for jar identification. Labels shall be placed on the lids so they can be periodically peeled, dried off and switched to maintain the integrity of the test.

(H) The following instruction shall be typed on a card and placed on the table in front of the two jars (i.e., 1 and 2): "The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also contain a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil."

(I) The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.

(J) If the test subject is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test shall not be performed.

(K) If the test subject correctly identifies the jar containing the odor test solution, the test subject may proceed to respirator selection and fit testing.

(ii) Isoamyl acetate fit test.

(A) The fit test chamber shall be similar to a clear fifty-five gallon drum liner suspended inverted over a two-foot diameter frame so that the top of the chamber is about six inches above the test subject's head. The inside top center of the chamber shall have a small hook attached.

(B) Each respirator used for the fitting and fit testing shall be equipped with organic vapor cartridges or offer protection against organic vapors. The cartridges or masks shall be changed at least weekly.

(C) After selecting, donning, and properly adjusting a respirator, the test subject shall wear it to the fit testing room. This room shall be separate from the room used for odor threshold screening and respirator selection, and shall be well ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.

(D) A copy of the test exercises and any prepared text from which the subject is to read shall be taped to the inside of the test chamber.

(E) Upon entering the test chamber, the test subject shall be given a six-inch by five-inch piece of paper towel, or other porous, absorbent, single-ply material, folded in half, and wetted with 0.75 cc of pure IAA. The test subject shall hang the wet towel on the hook at the top of the chamber.

(F) Allow two minutes for the IAA test concentration to stabilize before starting the fit test exercises. This would be an appropriate time to talk with the test subject; to explain the fit test, the importance of his/her cooperation, and the purpose for the head exercises; or to demonstrate some of the exercises.

(G) If at any time during the test, the subject detects the banana like odor of IAA, the test has failed. The subject shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.

(H) If the test has failed, the subject shall return to the selection room and remove the respirator, repeat the odor sensitivity test, select and put on another respirator, return to the test chamber and again begin the procedure described in (b)(ii)(A) through (G) of this subsection. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the subject shall wait about five minutes before retesting. Odor sensitivity will usually have returned by this time.

(I) When a respirator is found that passes the test, its efficiency shall be demonstrated for the subject by having the subject break the face seal and take a breath before exiting the chamber.

(J) When the test subject leaves the chamber, the subject shall remove the saturated towel and return it to the person conducting the test. To keep the test area from becoming contaminated, the used towels shall be kept in a self-sealing bag so there is no significant IAA concentration build-up in the test chamber during subsequent tests.

(c) Saccharin solution aerosol protocol. The saccharin solution aerosol QLFT protocol is the only currently available, validated test protocol for use with particulate disposable dust respirators not equipped with high-efficiency filters. The entire screening and testing procedure shall be explained to the test subject prior to the conduct of the screening test.

(i) Taste threshold screening. The saccharin taste threshold screening, performed without wearing a respirator, is intended to determine whether the individual being tested can detect the taste of saccharin.

(A) Threshold screening as well as fit testing subjects shall wear an enclosure about the head and shoulders that is approximately twelve inches in diameter by fourteen inches tall with at least the front portion clear and

that allows free movements of the head when a respirator is worn. An enclosure substantially similar to the 3M hood assembly, parts NZ FT 14 and NZ FT 15 combined, is adequate.

(B) The test enclosure shall have a three-quarter inch hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.

(C) The test subject shall don the test enclosure. Throughout the threshold screening test, the test subject shall breathe through his/her wide open mouth with tongue extended.

(D) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer the test conductor shall spray the threshold check solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.

(E) The threshold check solution consists of 0.83 grams of sodium saccharin USP in 1 cc of warm water. It can be prepared by putting 1 cc of the fit test solution (see (c)(ii)(E) of this subsection) in 100 cc of distilled water.

(F) To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then released and allowed to fully expand.

(G) Ten squeezes are repeated rapidly and then the test subject is asked whether the saccharin can be tasted.

(H) If the first response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted.

(I) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin is tasted.

(J) The test conductor will take note of the number of squeezes required to solicit a taste response.

(K) If the saccharin is not tasted after thirty squeezes, the test subject may not perform the saccharin fit test.

(L) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

(M) Correct use of the nebulizer means that approximately 1 cc of liquid is used at a time in the nebulizer body.

(N) The nebulizer shall be thoroughly rinsed in water, shaken dry, and refilled at least each morning and afternoon or at least every four hours.

(ii) Saccharin solution aerosol fit test procedure.

(A) The test subject may not eat, drink (except plain water), or chew gum for fifteen minutes before the test.

(B) The fit test uses the same enclosure described in (c)(i) of this subsection.

(C) The test subject shall don the enclosure while wearing the respirator selected in (c)(i) of this subsection. The respirator shall be properly adjusted and equipped with a particular filter(s).

(D) A second DeVilbiss Model 40 Inhalation Medication Nebulizer is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

(E) The fit test solution is prepared by adding eighty-three grams of sodium saccharin to 100 cc of warm water.

(F) As before, the test subject shall breathe through the open mouth with tongue extended.

(G) The nebulizer is inserted into the hole in the front of the enclosure and the fit test solution is sprayed into the enclosure using the same number of squeezes required to elicit a taste response in the screening test.

(H) After generating the aerosol the test subject shall be instructed to perform the exercises in subsection (1)(n) of this section.

(I) Every thirty seconds the aerosol concentration shall be replenished using one-half the number of squeezes as initially used.

(J) The test subject shall indicate to the test conductor if at any time during the fit test the taste of saccharin is detected.

(K) If the taste of saccharin is detected, the fit is deemed unsatisfactory and a different respirator shall be tried.

(d) Irritant fume protocol.

(i) The respirator to be tested shall be equipped with high-efficiency particulate air (HEPA) filters.

(ii) The test subject shall be allowed to smell a weak concentration of the irritant smoke before the respirator is donned to become familiar with its characteristic odor.

(iii) Break both ends of a ventilation smoke tube containing stannic oxychloride, such as the MSA part No. 5645, or equivalent. Attach one end of the smoke tube to a low flow air pump set to deliver two hundred milliliters per minute.

(iv) If a half-mask is being fitted, advise the test subject that the smoke can be irritating to the eyes and instruct the subject to keep his/her eyes closed while the test is performed.

(v) The test conductor shall direct the stream of irritant smoke from the smoke tube towards the face seal area of the test subject. He/she shall begin at least twelve inches from the facepiece and gradually move to within one inch, moving around the whole perimeter of the mask.

(vi) The exercises identified in subsection (1)(n) of this section shall be performed by the test subject while the respirator seal is being challenged by the smoke.

(vii) Each test subject passing the smoke test without evidence of a response shall be given a sensitivity check of the smoke from the same tube once the respirator has been removed to determine whether he/she reacts to the smoke. Failure to evoke a response shall void the fit test.

(viii) The fit test shall be performed in a location with exhaust ventilation sufficient to prevent general contamination of the testing area by the test agent.

(3) Quantitative fit test (QNFT) protocol.

(a) General.

(i) The employer shall assign specific individuals who shall assume full responsibility for implementing the respirator quantitative fit test program.

(ii) The employer shall ensure that persons administering QNFT are able to calibrate equipment and perform tests properly, recognize invalid tests, calculate fit factors properly and assure that test equipment is in proper working order.

(iii) The employer shall assure that QNFT equipment is kept clean and well maintained so as to operate at the parameters for which it was designed.

(b) Definitions.

(i) "Quantitative fit test." The test is performed in a test chamber. The normal air-purifying element of the respirator is replaced by a high-efficiency particulate air (HEPA) filter in the case of particulate QNFT aerosols or a sorbent offering contaminant penetration protection equivalent to high-efficiency filters where the QNFT test agency is a gas or vapor.

(ii) "Challenge agent" means the aerosol, gas, or vapor introduced into a test chamber so that its concentration inside and outside the respirator may be measured.

(iii) "Test subject" means the person wearing the respirator for quantitative fit testing.

(iv) "Normal standing position" means standing erect and straight with arms down along the sides and looking straight ahead.

(v) "Maximum peak penetration method" means the method of determining test agent penetration in the respirator as determined by strip chart recordings of the test. The highest peak penetration for a given exercise is taken to be representative of average penetration into the respirator for that exercise.

(vi) "Average peak penetration method" means the method of determining test agent penetration into the respirator utilizing a strip chart recorder, integrator, or computer. The agent penetration is determined by an average of the peak heights on the graph or by computer integration, for each exercise except the grimace exercise. Integrators or computers which calculate the actual test agent penetration into the respirator for each exercise will also be considered to meet the requirements of the average peak penetration method.

(vii) "Fit factor" means the ratio of challenge agent concentration outside with respect to the inside of a respirator inlet covering (facepiece or enclosure).

(c) Apparatus.

(i) Instrumentation. Aerosol generation, dilution, and measurement systems using corn oil or sodium chloride as test aerosols shall be used for quantitative fit testing.

(ii) Test chamber. The test chamber shall be large enough to permit all test subjects to perform freely all required exercises without disturbing the challenge agent concentration or the measurement apparatus. The test chamber shall be equipped and constructed so that the challenge agent is effectively isolated from the ambient air, yet uniform in concentration throughout the chamber.

(iii) When testing air-purifying respirators, the normal filter or cartridge element shall be replaced with a high-efficiency particulate filter supplied by the same manufacturer.

(iv) The sampling instrument shall be selected so that a strip chart record may be made of the test showing the rise and fall of the challenge agent concentration with each inspiration and expiration at fit factors of at least two thousand. Integrators or computers which integrate the amount of test agent penetration leakage into the

respirator for each exercise may be used provided a record of the readings is made.

(v) The combination of substitute air-purifying elements, challenge agent, and challenge agent concentration in the test chamber shall be such that the test subject is not exposed in excess of an established exposure limit for the challenge agent at any time during the testing process.

(vi) The sampling port on the test specimen respirator shall be placed and constructed so that no leakage occurs around the port (e.g., where the respirator is probed), a free air flow is allowed into the sampling line at all times and so that there is no interference with the fit or performance of the respirator.

(vii) The test chamber and test set-up shall permit the person administering the test to observe the test subject inside the chamber during the test.

(viii) The equipment generating the challenge atmosphere shall maintain the concentration of challenge agent inside the test chamber constant to within a ten percent variation for the duration of the test.

(ix) The time lag (interval between an event and the recording of the event on the strip chart or computer or integrator) shall be kept to a minimum. There shall be a clear association between the occurrence of an event inside the test chamber and its being recorded.

(x) The sampling line tubing for the test chamber atmosphere and for the respirator sampling port shall be of equal diameter and of the same material. The length of the two lines shall be equal.

(xi) The exhaust flow from the test chamber shall pass through a high-efficiency filter before release.

(xii) When sodium chloride aerosol is used, the relative humidity inside the test chamber shall not exceed fifty percent.

(xiii) The limitations of instrument detection shall be taken into account when determining the fit factor.

(xiv) Test respirators shall be maintained in proper working order and inspected for deficiencies such as cracks, missing valves and gaskets, etc.

(d) Procedural requirements.

(i) When performing the initial positive or negative pressure test the sampling line shall be crimped closed in order to avoid air pressure leakage during either of these tests.

(ii) An abbreviated screening isoamyl acetate test or irritant fume test may be utilized in order to quickly identify poor fitting respirators which passed the positive and/or negative pressure test and thus reduce the amount of QNFT time. When performing a screening isoamyl acetate test, combination high-efficiency organic vapor cartridges/canisters shall be used.

(iii) A reasonable stable challenge agent concentration shall be measured in the test chamber prior to testing. For canopy or shower curtain type of test units the determination of the challenge agent stability may be established after the test subject has entered the test environment.

(iv) Immediately after the subject enters the test chamber, the challenge agent concentration inside the

respirator shall be measured to ensure that the peak penetration does not exceed five percent for a half mask or one percent for a full facepiece respirator.

(v) A stable challenge concentration shall be obtained prior to the actual start of testing.

(vi) Respirator restraining straps shall not be overtightened for testing. The straps shall be adjusted by the wearer without assistance from other persons to give a reasonable comfortable fit typical of normal use.

(vii) The test shall be terminated whenever any single peak penetration exceeds five percent for half masks and one percent for full facepiece respirators. The test subject shall be refitted and retested. If two of the three required tests are terminated, the fit shall be deemed inadequate.

(viii) In order to successfully complete a QNFT, three successful fit tests are required. The results of each of the three independent fit tests must exceed the minimum fit factor needed for the class of respirator (e.g., half mask respirator, full facepiece respirator).

(ix) Calculation of fit factors.

(A) The fit factor shall be determined for the quantitative fit test by taking the ratio of the average chamber concentration to the concentration inside the respirator.

(B) The average test chamber concentration is the arithmetic average of the test chamber concentration at the beginning and of the end of the test.

(c) The concentration of the challenge agent inside the respirator shall be determined by one of the following methods:

(I) Average peak concentration;

(II) Maximum peak concentration;

(III) Integration by calculation of the area under the individual peak for each exercise. This includes computerized integration.

(x) Interpretation of test results. The fit factor established by the quantitative fit testing shall be the lowest of the three fit factor values calculated from the three required fit tests.

(xi) The test subject shall not be permitted to wear a half mask, or full facepiece respirator unless a minimum fit factor equivalent to at least ten times the hazardous exposure level is obtained.

(xii) Filters used for quantitative fit testing shall be replaced at least weekly, or whenever increased breathing resistance is encountered, or when the test agent has altered the integrity of the filter media. Organic vapor cartridges/canisters shall be replaced daily (when used) or sooner if there is any indication of breakthrough by a test agent.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-07550, filed 10/6/88, effective 11/7/88.]

**PART I-1--ASBESTOS, TREMOLITE,
ANTHOPHYLLITE, AND ACTINOLITE**

**WAC 296-62-077 Asbestos, tremolite,
anthophyllite, and actinolite.**

[Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-077, filed 4/27/87.]

WAC 296-62-07701 Scope and application. WAC 296-62-07701 through 296-62-07753 applies to all occupational exposures to asbestos in all industries covered by the Washington Industrial Safety and Health Act.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07701, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07701, filed 4/27/87.]

WAC 296-62-07703 Definitions. For the purpose of WAC 296-62-077 through 296-62-07753:

(1) "Action level" means an airborne concentration of asbestos of 0.1 fiber per cubic centimeter (f/cc) of air calculated as an eight-hour time-weighted average.

(2) "Air lock" means a system for ingress or egress to minimize air movement between a contaminated area and an uncontaminated area, consisting of an enclosure with two curtained doorways at least six feet apart unless space prohibits.

(3) "Asbestos" includes chrysotile, amosite, crocidolite, tremolite asbestos, anthophyllite asbestos, actinolite asbestos, and any of these minerals that have been chemically treated and/or altered.

(4) "Authorized person" means any person authorized by the employer and required by work duties to be present in regulated areas.

(5) "Clean room" means an uncontaminated room having facilities for the storage of employees' street clothing and uncontaminated materials and equipment.

(6) "Competent person" means one who is capable of identifying existing asbestos hazards in the workplace and who has the authority to take prompt corrective measures to eliminate them, as specified in WAC 296-155-012(4). The duties of the competent person include at least the following: Establishing the negative-pressure enclosure, ensuring its integrity, and controlling entry to and exit from the enclosure; supervising any employee exposure monitoring required by the standard; ensuring that all employees working within such an enclosure wear the appropriate personal protective equipment, are trained in the use of appropriate methods of exposure control, and use the hygiene facilities and decontamination procedures specified in the standard; and ensuring that engineering controls in use are in proper operating condition and are functioning properly. To be designated as a competent person, the worker must satisfactorily complete a training course in accordance with WAC 296-62-07712(3).

(7) "Curtained doorway" means overlapping plastic sheeting curtains, at least four mils in thickness, constructed and used at entrance and exit of regulated areas, and designed to restrict the movement of air from one area to another.

(8) "Decontamination area" means an enclosed area adjacent and connected to the regulated area and consisting of an equipment room, shower area, and clean room, which is used for the decontamination of workers, materials, and equipment contaminated with asbestos.

(9) "Demolition" means the wrecking or taking out of any load-supporting structural member and any related razing, removing, or stripping of asbestos products.

(10) "Department" means the department of labor and industries.

(11) "Director" means the director of the department of labor and industries or his/her authorized representatives.

(12) "Employee exposure" means that exposure to airborne asbestos that would occur if the employee were not using respiratory protective equipment.

(13) "Equipment room" means a contaminated room located within the decontamination area that is supplied with impermeable bags or containers for the disposal of contaminated protective clothing and equipment.

(14) "Fiber" means a particulate form of asbestos, five micrometers or longer, with a length-to-diameter ratio of at least three to one.

(15) "High-efficiency particulate air (HEPA) filter" means a filter capable of trapping and retaining at least 99.97 percent of all monodispersed particles of 0.3 micrometers mean aerodynamic diameter or larger.

(16) "Regulated area" means an area established by the employer to demarcate areas where airborne concentrations of asbestos exceed, or can reasonably be expected to exceed, the permissible exposure limit. The regulated area may take the form of (a) a temporary enclosure, as required by WAC 296-62-07711, or (b) an area demarcated in any manner that minimizes the number of employees exposed to asbestos.

(17) "Removal" means the taking out or stripping of asbestos or materials containing asbestos.

(18) "Renovation" means the modifying of any existing structure, or portion thereof, where exposure to airborne asbestos may result.

(19) "Repair" means overhauling, rebuilding, reconstructing, or reconditioning of structure or substrates where asbestos is present.

(20) "Small-scale, short duration operations" means tasks involving less than ten linear feet and less than eleven square feet of material. This means a total of eleven square feet of material whether on flat surfaces or not and includes pipes. Regardless of pipe diameter, runs cannot exceed ten linear feet.

(21) "Structural member" means any load-supporting or nonload-supporting member of a facility such as beams, walls, and ceilings.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07703, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07703, filed 4/27/87.]

WAC 296-62-07705 Permissible exposure limits (PEL). (1) The employer shall ensure that no employee is exposed to an airborne concentration of asbestos in excess of 0.2 fiber per cubic centimeter (0.2 f/cc) of air as an eight-hour time-weighted average (TWA) as determined by the method prescribed in WAC 296-62-07735, Appendix A, or by an equivalent method recognized by the department.

(2) Ceiling concentration. No employee shall be exposed at any time to airborne concentrations of asbestos in excess of 1.0 fiber per cubic centimeter (1.0 f/cc) of air during any fifteen minute period, as determined by

the methods prescribed in WAC 296-62-07735, Appendix A, or by an equivalent method recognized by the department.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07705, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07705, filed 4/27/87.]

WAC 296-62-07706 Communication among employers. On multi-employer worksites, an employer performing asbestos work requiring the establishment of a regulated area shall inform other employers on the site of the nature of the employer's work with asbestos and of the existence of and requirements pertaining to regulated areas.

Note: Notified employers shall ensure their employees are informed and trained as required by the hazard communication standard, WAC 296-62-054 through 296-62-05427.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07706, filed 11/30/87.]

WAC 296-62-07707 Identification. The employer shall determine if materials to be worked on or removed contain asbestos. Determinations shall be documented (e.g., laboratory analysis report, manufacturer's product information), maintained on file and made available upon request to the director. A determination shall not be required when an employer assumes that the suspect material contains asbestos and handles the material in accordance with WAC 296-62-077 through 296-62-07753.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07707, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07707, filed 4/27/87.]

WAC 296-62-07709 Exposure monitoring. (1) General.

(a) Each employer shall perform monitoring to determine accurately the airborne concentrations of asbestos to which employees may be exposed.

(b) Determinations of employee exposure shall be made from breathing zone air samples that are representative of the eight-hour TWA of each employee and of the ceiling concentrations of each employee.

(c) Representative eight-hour TWA employee exposures shall be determined on the basis of one or more samples representing full-shift exposures for each shift for each employee in each job classification in each work area.

(d) Representative employee ceiling exposure shall be determined on the basis of one or more samples representing the highest exposure for employees in each work area. Sampling periods for ceiling concentration evaluations shall not exceed fifteen minutes.

(e) Prior to the start of the removal, demolition, or renovation project, representative area monitoring shall be conducted for later use (see WAC 296-62-07713 (2)(c)).

(2) Initial monitoring.

(a) Each employer who has a workplace or work operation covered by this standard, except as provided for

in (b) and (c) of this subsection, shall perform initial monitoring of employees who are, or may reasonably be expected to be exposed to airborne concentrations at or above the action level. The initial monitoring shall be at the initiation of each asbestos job to accurately determine the airborne concentration of asbestos to which employees may be exposed.

(b) Where the employer or his/her representative has monitored after December 20, 1985, the monitoring satisfies all other requirements of this section, and the monitoring data was obtained during work operations conducted at the same workplace and under workplace conditions closely resembling the processes, type of material including percentage of asbestos, control methods, work practices, and environmental conditions used and prevailing in the employer's current operations, the employer may rely on such earlier monitoring results to satisfy the requirements of (a) of this subsection, except for employees engaged in removal, demolition, or renovation operations using negative-pressure enclosures as required by WAC 296-62-07712. The employer may rely on such earlier monitoring results to satisfy the requirements of (a) of this subsection.

(c) Where the employer has relied upon objective data that demonstrates that asbestos is not capable of being released in airborne concentrations at or above the action level under those work conditions of processing, use, or handling expected to have the greatest potential for releasing asbestos, then no initial monitoring is required.

(3) Monitoring frequency (periodic monitoring) and patterns. After the initial determinations required by subsection (2)(a) of this section, samples shall be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of the employees.

(a) In no case shall sampling be at intervals greater than six months for employees whose exposures may reasonably be foreseen to exceed the action level.

(b) Daily monitoring within regulated areas: The employer shall conduct daily monitoring that is representative of the exposure of each employee who is assigned to work within a regulated area. Exception: When all employees within a regulated area are equipped with full facepiece supplied-air respirators operated in the pressure-demand mode equipped with either an auxiliary positive pressure self-contained breathing apparatus or a HEPA filter, the employer may dispense with the daily monitoring required by this subsection.

(c) Monitoring outside negative-pressure enclosures: The employer shall conduct representative area monitoring of the airborne fiber levels at least every other day at the HEPA machine exhaust and entrance to the decontamination area.

(4) Changes in monitoring frequency. If either the initial or the periodic monitoring required by subsections (2) and (3) of this section statistically indicates that employee exposures are below the action level, the employer may discontinue the monitoring for those employees whose exposures are represented by such monitoring.

(5) Additional monitoring. Notwithstanding the provisions of subsections (2)(b) and (4) of this section, the

employer shall institute the exposure monitoring required under subsections (2)(a) and (3) of this section whenever there has been a change in the production, process, control equipment, personnel, or work practices that may result in new or additional exposures above the action level or when the employer has any reason to suspect that a change may result in new or additional exposures above the action level.

(6) Method of monitoring.

(a) All samples taken to satisfy the monitoring requirements of this section shall be personal samples collected following the procedures specified in WAC 296-62-07735, Appendix A.

(b) Monitoring shall be performed by persons having a thorough understanding of monitoring principles and procedures and who can demonstrate proficiency in sampling techniques.

(c) All samples taken to satisfy the monitoring requirements of this section shall be evaluated using the WISHA reference method specified in WAC 296-62-07735, Appendix A, or an equivalent counting method recognized by the department.

(d) If an equivalent method to the WISHA reference method is used, the employer shall ensure that the method meets the following criteria:

(i) Replicate exposure data used to establish equivalency are collected in side-by-side field and laboratory comparisons;

(ii) The comparison indicates that ninety percent of the samples collected in the range 0.1 to 0.4 f/cc have an accuracy range of plus or minus twenty-five percent of the WISHA reference method results with a ninety-five percent confidence level as demonstrated by a statistically valid protocol; and

(iii) The equivalent method is documented and the results of the comparison testing are maintained.

(e) To satisfy the monitoring requirements of this section, employers must use the results of monitoring analysis performed by laboratories which have instituted quality assurance programs that include the elements as prescribed in WAC 296-62-07735, Appendix A.

(7) Employee notification of monitoring results.

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

(b) The written notification required by (a) of this subsection shall contain the corrective action being taken by the employer to reduce employee exposure to or below the PEL, wherever monitoring results indicated that the PEL had been exceeded.

(8) Observation of monitoring.

(a) The employer shall provide affected employees or their designated representatives an opportunity to observe any monitoring of employee exposure to asbestos conducted in accordance with this section.

(b) When observation of the monitoring of employee exposure to asbestos requires entry into an area where the use of protective clothing or equipment is required,

the observer shall be provided with and be required to use such clothing and equipment and shall comply with all other applicable safety and health procedures.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07709, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07709, filed 4/27/87.]

WAC 296-62-07711 Regulated areas. (1) General.

The employer shall establish a regulated area in work areas where airborne concentrations of asbestos exceed or can reasonably be expected to exceed the permissible exposure limit prescribed in WAC 296-62-07705.

(2) Demarcation. The regulated area shall be demarcated in any manner that minimizes the number of persons within the area and protects persons outside the area from exposure to airborne concentrations of asbestos in excess of the permissible exposure limit.

(3) Access. Access to regulated areas shall be limited to authorized persons or to persons authorized by the Washington Industrial Safety and Health Act or regulations issued pursuant thereto.

(4) Provision of respirators. Each person entering a regulated area shall be supplied with and required to use a respirator, selected in accordance with WAC 296-62-07715.

(5) Protective clothing. All persons entering a regulated area shall be supplied with and required to wear protective clothing, selected in accordance with WAC 296-62-07717.

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

(7) Confined space. The employer shall determine if a confined space hazard exists and shall take any necessary precautions in accordance with chapter 296-62 WAC.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07711, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07711, filed 4/27/87.]

WAC 296-62-07712 Requirements for asbestos removal, demolition, and renovation operations. (1) Except

when proper glove bag techniques are used, the employer, wherever feasible, shall establish negative-pressure enclosures having a minimum of one air exchange every fifteen minutes within the enclosure before commencing removal, demolition, and renovation operations.

(2) The employer shall designate a competent person to perform or supervise the following duties:

(a) Set up the enclosure;

(b) Ensure the integrity of the enclosure;

(c) Control entry to and exit from the enclosure;

(d) Supervise all employee exposure monitoring required by this section;

(e) Ensure that employees working within the enclosure wear protective clothing and respirators as required by WAC 296-62-07715 and 296-62-07717;

(f) Ensure that employees are trained in the use of engineering controls, work practices, and personal protective equipment;

(g) Ensure that employees use the hygiene facilities and observe the decontamination procedures specified in WAC 296-62-07719; and

(h) Ensure that engineering controls including HEPA filters are functioning properly.

(3) In addition to the qualifications specified in WAC 296-62-07703, the competent person shall be trained in all aspects of asbestos abatement, the contents of this standard, the identification of asbestos and their removal procedures, and other practices for reducing the hazard. Such training shall be obtained in a comprehensive course conducted by an EPA asbestos training center, or an equivalent training course recognized by the department as complying with the requirements of this subsection. Every competent person shall also maintain a valid asbestos worker certificate as specified in WAC 296-65-010.

(4) Exception: For small-scale, short-duration operations, such as pipe repair, valve replacement, installing electrical conduits, installing or removing drywall, roofing, and other general building maintenance or renovation, the employer is not required to comply with the requirements of WAC 296-62-07712. Employers wishing to take advantage of the exemption in this subsection shall comply with WAC 296-62-07753, Appendix J.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07712, filed 11/30/87.]

WAC 296-62-07713 Methods of compliance. (1) Engineering controls and work practices.

(a) The employer shall institute engineering controls and work practices to reduce and maintain employee exposure to or below the exposure limit prescribed in WAC 296-62-07705, except to the extent that such controls are not feasible. Engineering controls and work practices include but are not limited to the following:

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

(ii) Vacuum cleaners equipped with HEPA filters;

(iii) Enclosure or isolation of processes producing asbestos dust;

(iv) Use of wet methods, wetting agents, or removal encapsulants to control employee exposures during asbestos handling, mixing, removal, cutting, application, and cleanup;

(v) Prompt disposal of wastes contaminated with asbestos in leak-tight containers; or

(vi) Use of work practices or other engineering controls that the director can show to be feasible.

(b) Wherever the feasible engineering controls and work practices that can be instituted are not sufficient to reduce employee exposure to or below the permissible exposure limit prescribed in WAC 296-62-07705, the employer shall use them to reduce employee exposure to the lowest levels achievable by these controls and shall supplement them by the use of respiratory protection that complies with the requirements of WAC 296-62-07715.

(c) For the following operations, wherever feasible engineering controls and work practices that can be instituted are not sufficient to reduce the employee exposure to or below the permissible exposure limit prescribed in WAC 296-62-07705, the employer shall use them to reduce employee exposure to or below 0.5 fiber per cubic centimeter of air (as an eight-hour time-weighted average) and shall supplement them by the use of any combination of respiratory protection that complies with the requirements of WAC 296-62-07715, work practices and feasible engineering controls that will reduce employee exposure to or below the permissible exposure limit prescribed in WAC 296-62-07705: Coupling cutoff in primary asbestos cement pipe manufacturing; sanding in primary and secondary asbestos cement sheet manufacturing; grinding in primary and secondary friction product manufacturing; carding and spinning in dry textile processes; and grinding and sanding in primary plastics manufacturing.

(d) Local exhaust ventilation. Local exhaust ventilation and dust collection systems shall be designed, constructed, installed, and maintained in accordance with good practices such as those found in the American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Z9.2-1979.

(e) Particular tools. All hand-operated and power-operated tools which would produce or release fibers of asbestos so as to expose employees to levels in excess of the exposure limit prescribed in WAC 296-62-07705, such as, but not limited to, saws, scorers, abrasive wheels, and drills, shall be provided with local exhaust ventilation systems which comply with (d) of this subsection. High-speed abrasive disc saws that are not equipped with appropriate engineering controls shall not be used for work related to asbestos.

(f) Wet methods. Insofar as practicable, asbestos shall be handled, mixed, applied, removed, cut, scored, or otherwise worked in a wet state sufficient to prevent the emission of airborne fibers so as to expose employees to levels in excess of the exposure limit prescribed in WAC 296-62-07705, unless the usefulness of the product would be diminished thereby.

(g) Materials containing asbestos shall not be applied by spray methods unless the materials contain less than 0.1% asbestos by weight, the asbestos is a natural contaminant and objective data indicate employee exposure will not exceed the action level of 0.1 f/cc.

(h) Particular products and operations. No asbestos cement, mortar, coating, grout, plaster, or similar material containing asbestos shall be removed from bags, cartons, or other containers in which they are shipped, without being either wetted, enclosed, or ventilated so as to prevent effectively the release of airborne fibers of asbestos so as to expose employees to levels in excess of the limit prescribed in WAC 296-62-07705.

(i) Compressed air. Compressed air shall not be used to remove asbestos or materials containing asbestos unless the compressed air is used in conjunction with an enclosed ventilation system designed to capture the dust cloud created by the compressed air.

(2) Clean-up.

(a) After completion of asbestos removal, demolition, and renovation operations, all surfaces in and around the work area shall be cleared of any asbestos debris.

(b) Lock-down. Where asbestos has been removed, encapsulant shall be applied to ensure binding of remaining fibers.

(c) The employer shall demonstrate by monitoring that the airborne fiber concentration is below the action level; or, at or below the airborne fiber level existing prior to the start of the removal, demolition, or renovation project; whichever level is lower.

(3) Compliance program.

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

(b) Such programs shall be reviewed and updated as necessary to reflect significant changes in the status of the employer's compliance program.

(c) Written programs shall be submitted upon request for examination and copying to the director, affected employees and designated employee representatives.

(d) The employer shall not use employee rotation as a means of compliance with the PEL.

[Statutory Authority: Chapter 49.17 RCW, 87-24-051 (Order 87-24), § 296-62-07713, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040, 87-10-008 (Order 87-06), § 296-62-07713, filed 4/27/87.]

WAC 296-62-07715 Respiratory protection. (1)

General. The employer shall provide respirators, and ensure that they are used, where required by WAC 296-62-077 through 296-62-07753. Respirators shall be used in the following circumstances:

(a) During the interval necessary to install or implement feasible engineering and work practice controls;

(b) In work operations, such as maintenance and repair activities, or other activities for which engineering and work practice controls are not feasible;

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

(d) In emergencies;

(e) In all regulated areas; and

(f) Whenever employee exposure exceeds the PEL.

(2) Respirator selection.

(a) Where respirators are required under this section, the employer shall select and provide at no cost to the employee, the appropriate respirator as specified in Table 1 of this section and shall ensure that the employee uses the respirator provided. The employer shall select respirators from among those approved as being acceptable for protection by the Mine Safety and Health Administration (MSHA) or by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11.

(b) The employer shall provide a powered, air-purifying respirator in lieu of any negative pressure respirator specified in Table 1 of this section whenever:

(i) An employee chooses to use this type of respirator; and

(ii) This respirator will provide adequate protection to the employee.

TABLE 1—RESPIRATORY PROTECTION FOR ASBESTOS FIBERS

Concentration of asbestos fibers	Required Respirator ^a
Not in excess of 2 f/cc.	1. Half-mask, air-purifying respirator, other than a disposable respirator, equipped with high-efficiency filters. ^b
Not in excess of 10 f/cc.	1. Full facepiece air-purifying respirator equipped with high-efficiency filters.
Not in excess of 20 f/cc.	1. Any powered air-purifying respirator equipped with high-efficiency filters. 2. Any supplied-air respirator operated in continuous flow mode.
Not in excess of 200 f/cc.	1. Full facepiece supplied-air respirator operated in pressure demand mode.
Greater than 200 f/cc or unknown concentration.	1. Full facepiece supplied-air respirator operated in pressure-demand mode equipped with either an auxiliary positive pressure self-contained breathing apparatus or a HEPA filter. ^c 2. Full facepiece positive-pressure self-contained breathing apparatus (SCBA).

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

b. A high-efficiency filter means a filter that is capable of trapping and retaining at least 99.97 percent of all monodispersed particles of 0.3 micrometers mean aerodynamic diameter or larger.

c. See subsection (5)(c) of this section for fit testing requirements.

(3) Special respiratory protection requirements. Unless specifically identified in this subsection, respirator selection for asbestos removal, demolition, and renovation operations shall be in accordance with Table 1 of subsection (2) of this section. The employer shall provide and require to be worn, at no cost to the employee, a full facepiece supplied-air respirator operated in the pressure demand mode equipped with either an auxiliary positive pressure self-contained breathing apparatus or a HEPA filter to employees engaged in the following asbestos operations:

(a) Inside negative pressure enclosures used for removal, demolition, and renovation of friable asbestos from walls, ceilings, vessels, ventilation ducts, elevator shafts, and other structural members, but does not include pipes or piping systems; or

(b) Any dry removal of asbestos.

(4) Respirator program.

(a) Where respiratory protection is required, the employer shall institute a respirator program in accordance with WAC 296-62-071.

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

(c) Employees who wear respirators shall be permitted to leave work areas to wash their faces and respirator facepieces whenever necessary to prevent skin irritation associated with respirator use.

(d) No employee shall be assigned to tasks requiring the use of respirators if, based upon his or her most recent examination, an examining physician determines that the employee will be unable to function normally wearing a respirator, or that the safety or health of the employee or other employees will be impaired by the use of a respirator. Such employee shall be assigned to another job or given the opportunity to transfer to a different position whose duties he or she is able to perform with the same employer, in the same geographical area and with the same seniority, status, and rate of pay the employee had just prior to such transfer, if such a different position is available.

(5) Respirator fit testing.

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

(b) For each employee wearing negative pressure respirators, employers shall perform either quantitative or qualitative face fit tests at the time of initial fitting and at least every six months thereafter. The qualitative fit tests may be used only for testing the fit of half-mask respirators to be worn in concentrations of asbestos not in excess of 2 f/cc, and shall be conducted in accordance with WAC 296-62-07739, Appendix C. The tests shall be used to select facepieces that provide the required protection as prescribed in Table 1 of this section.

(c) Any supplied-air respirator facepiece equipped with a back-up HEPA filter shall be quantitatively fit tested with the air supply disconnected at the time of initial fitting and at least every six months thereafter. The quantitative fit tests shall be conducted using the procedures described in WAC 296-62-07739(2), Appendix C, for negative pressure respirators.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07715, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07715, filed 4/27/87.]

WAC 296-62-07717 Protective work clothing and equipment. (1) Provision and use. If an employee is exposed to asbestos above the PEL, or where the possibility of eye irritation exists, the employer shall provide at no cost to the employee and ensure that the employee uses appropriate protective work clothing and equipment such as, but not limited to:

- (a) Coveralls or similar full-body work clothing;
- (b) Gloves, head coverings, and foot coverings; and

(c) Face shields, vented goggles, or other appropriate protective equipment which complies with WAC 296-24-07801.

(2) Removal and storage.

(a) The employer shall ensure that employees remove work clothing contaminated with asbestos only in change rooms provided in accordance with WAC 296-62-07719(1).

(b) The employer shall ensure that no employee takes contaminated work clothing out of the change room, except those employees authorized to do so for the purpose of laundering, maintenance, or disposal.

(c) Contaminated work clothing shall be placed and stored in closed containers which prevent dispersion of the asbestos outside the container.

(d) Containers of contaminated protective devices or work clothing which are to be taken out of change rooms or the workplace for cleaning, maintenance, or disposal, shall bear labels in accordance with WAC 296-62-07721(2).

(3) Cleaning and replacement.

(a) The employer shall clean, launder, repair, or replace protective clothing and equipment required by this paragraph to maintain their effectiveness. The employer shall provide clean protective clothing and equipment at least weekly to each affected employee.

(b) The employer shall prohibit the removal of asbestos from protective clothing and equipment by blowing or shaking.

(c) Laundering of contaminated clothing shall be done so as to prevent the release of airborne fibers of asbestos in excess of the permissible exposure limit prescribed in WAC 296-62-07705.

(d) Any employer who gives contaminated clothing to another person for laundering shall inform such person of the requirement in (c) of this subsection to effectively prevent the release of airborne fibers of asbestos in excess of the permissible exposure limit.

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

(f) Contaminated clothing shall be transported in sealed impermeable bags, or other closed, impermeable containers, and labeled in accordance with WAC 296-62-07721.

(4) Protective clothing for removal, demolition, and renovation operations.

(a) The competent person shall periodically examine worksuits worn by employees for rips or tears that may occur during performance of work.

(b) When rips or tears are detected while an employee is working within a negative-pressure enclosure, rips and tears shall be immediately mended, or the worksuit shall be immediately replaced.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07717, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07717, filed 4/27/87.]

WAC 296-62-07719 Hygiene facilities and practices. (1) Change rooms.

(a) The employer shall provide clean change rooms for employees required to work in regulated areas or required by WAC 296-62-07717(1) to wear protective clothing.

Exception: In lieu of the change area requirement specified in this subsection, the employer may permit employees in small-scale, short-duration operations, as described in WAC 296-62-07712(4), to clean their protective clothing with a portable HEPA-equipped vacuum before such employees leave the area where maintenance was performed.

(b) The employer shall ensure that change rooms are in accordance with WAC 296-24-120, and are equipped with two separate lockers or storage facilities, so separated as to prevent contamination of the employee's street clothes from his/her protective work clothing and equipment.

(2) Showers.

(a) The employer shall ensure that employees who work in areas where their airborne exposure is above the permissible exposure limit shower at the end of the work shift.

(b) The employer shall provide shower facilities which comply with WAC 296-24-12009(3).

(c) The employer shall ensure that employees who are required to shower pursuant to (a) of this subsection do not leave the workplace wearing any clothing or equipment worn during the work shift.

(3) Special requirements for removal, demolition, and renovation operations.

(a) Decontamination area. Except for small-scale, short-duration operations, as described in WAC 296-62-07753 Appendix J, the employer shall establish a decontamination area that is adjacent and connected to the regulated area for the decontamination of employees contaminated with asbestos. The decontamination area shall consist of an equipment room, shower area, and clean room in series. The employer shall ensure that employees enter and exit the regulated area through the decontamination area.

(b) Clean room. The clean room shall be equipped with a locker or appropriate storage container for each employee's use.

(c) Shower area. Where feasible, shower facilities shall be provided which comply with WAC 296-24-12009(3). The showers shall be contiguous both to the equipment room and the clean change room, unless the employer can demonstrate that this location is not feasible. Where the employer can demonstrate that it is not feasible to locate the shower between the equipment room and the clean change room, the employer shall ensure that employees:

(i) Remove asbestos contamination from their worksuits using a HEPA vacuum before proceeding to a shower that is not contiguous to the work area; or

(ii) Remove their contaminated worksuits, don clean worksuits, and proceed to a shower that is not contiguous to the work area.

(d) Equipment room. The equipment room shall be supplied with impermeable, labeled bags and containers

for the containment and disposal of contaminated protective clothing and equipment.

(e) Decontamination area entry procedures.

(i) The employer shall ensure that employees:

(A) Enter the decontamination area through the clean room;

(B) Remove and deposit street clothing within a locker provided for their use; and

(C) Put on protective clothing and respiratory protection before leaving the clean room.

(ii) Before entering the enclosure, the employer shall ensure that employees pass through the equipment room.

(f) Decontamination area exit procedures.

(i) Before leaving the regulated area, the employer shall ensure that employees remove all gross contamination and debris from their protective clothing.

(ii) The employer shall ensure that employees remove their protective clothing in the equipment room and deposit the clothing in labeled impermeable bags or containers.

(iii) The employer shall ensure that employees do not remove their respirators in the equipment room.

(iv) The employer shall ensure that employees shower prior to entering the clean room. When taking a shower, employees shall be fully wetted, including the face and hair, prior to removing their respirators.

(v) The employer shall ensure that, after showering, employees enter the clean room before changing into street clothes.

(g) Decontamination area for personnel shall not be used for the transportation of asbestos debris.

(h) Waste load-out procedure. The waste load-out area as required by WAC 296-62-07723(7) shall be used as an area for final preparation and external decontamination of waste containers, as a short term storage area for bagged waste, and as a port for transporting waste.

The employer shall ensure waste containers be free of all gross contaminated material before removal from the negative-pressure enclosure. Gross contamination shall be wiped, scraped off, or washed off containers before they are placed into a two chamber air lock which is adjacent to the negative-pressure enclosure. In the first chamber, the exterior of the waste container shall be decontaminated or placed within a second waste container, and then it shall be moved into the second chamber of the air lock for temporary storage or transferred outside of the regulated area. The second waste container shall not be reused unless thoroughly decontaminated.

(4) Lunchrooms.

(a) The employer shall provide lunchroom facilities for employees who work in areas where their airborne exposure is above the permissible exposure limit.

(b) The employer shall ensure that lunchroom facilities have a positive pressure, filtered air supply, and are readily accessible to employees.

(c) The employer shall ensure that employees who work in areas where their airborne exposure is above the permissible exposure limit wash their hands and faces prior to eating, drinking, or smoking.

(d) The employer shall ensure that employees do not enter lunchroom facilities with protective work clothing or equipment unless surface asbestos fibers have been removed from the clothing or equipment by vacuuming or other method that removes dust without causing the asbestos to become airborne.

[Statutory Authority: Chapter 49.17 RCW, 87-24-051 (Order 87-24), § 296-62-07719, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040, 87-10-008 (Order 87-06), § 296-62-07719, filed 4/27/87.]

WAC 296-62-07721 Communication of hazards to employees. (1) Warning signs.

(a) Warning signs shall be provided and displayed at each regulated area. In addition, warning signs shall be posted at all approaches to regulated areas so that an employee may read the signs and take necessary protective steps before entering the area.

(b) The warning signs required by (a) of this subsection shall bear the following information:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING ARE REQUIRED
IN THIS AREA

(2) Warning labels.

(a) Warning labels shall be affixed to all products containing asbestos including raw materials, mixtures, scrap, waste, debris, and other products containing asbestos fibers, and to their containers including waste containers. Where feasible, installed asbestos products shall contain a visible label.

(b) Labels shall be printed in large, bold letters on a contrasting background.

(c) The labels shall comply with the requirements of WAC 296-62-05411, and shall include the following information:

DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE HAZARD
AVOID BREATHING AIRBORNE ASBESTOS FIBERS

(d) Where minerals to be labeled are only tremolite, anthophyllite, or actinolite, the employer may replace the term "asbestos" with the appropriate mineral name.

(3) Material safety data sheets. Employers who are manufacturers or importers of asbestos, or asbestos products shall comply with the requirements regarding development of material safety data sheets as specified in WAC 296-62-05413, except as provided by subsection (4) of this section.

(4) The provisions for labels required by subsection (2) of this section or for material safety data sheets required by subsection (3) of this section do not apply where:

(a) Asbestos fibers have been modified by a bonding agent, coating, binder, or other material, provided that

the manufacturer can demonstrate that during any reasonably foreseeable use, handling, storage, disposal, processing, or transportation, no airborne concentrations of fibers of asbestos in excess of the action level will be released; or

(b) Asbestos is present in a product in concentrations less than 0.1 percent by weight.

(5) Employee information and training.

(a) The employer shall institute a training program for all employees who are exposed to airborne concentrations of asbestos at or above the action level and ensure their participation in the program.

(b) Training shall be provided prior to or at the time of initial assignment, unless the employee has received equivalent training within the previous twelve months, and at least annually thereafter.

(c) The training program shall be conducted in a manner which the employee is able to understand. The employer shall ensure that each employee is informed of the following:

(i) The health effects associated with asbestos;

(ii) The relationship between smoking and exposure to asbestos in producing lung cancer;

(iii) Methods of recognizing asbestos and the quantity, location, manner of use, release, and storage of asbestos and the specific nature of operations which could result in exposure to asbestos;

(iv) The engineering controls and work practices associated with the employee's job assignment;

(v) The specific procedures implemented to protect employees from exposure to asbestos such as appropriate work practices, housekeeping procedures, hygiene facilities, decontamination procedures, emergency and clean-up procedures, personal protective equipment to be used, and waste disposal procedures, and any necessary instructions in the use of these controls and procedures;

(vi) The purpose, proper use, and limitations of respirators and protective clothing;

(vii) The purpose and a description of the medical surveillance program required by WAC 296-62-07725; and

(viii) The content of this standard, including appendices.

(d) Access to information and training materials.

(i) The employer shall make a copy of this standard and its appendices readily available without cost to all affected employees.

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

(6) Certification.

(a) All individuals working on asbestos projects, as defined in WAC 296-65-003(4) shall be certified as required by WAC 296-65-010 and 296-65-030.

(b) In cases excepted under WAC 296-65-030 (1) and (2), all employees shall be trained according to subsection (5) of this section.

[Statutory Authority: Chapter 49.17 RCW, 87-24-051 (Order 87-24), § 296-62-07721, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040, 87-10-008 (Order 87-06), § 296-62-07721, filed 4/27/87.]

WAC 296-62-07723 Housekeeping. (1) All surfaces shall be maintained as free as practicable of accumulations of dusts and waste containing asbestos.

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

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

(4) Vacuuming. HEPA-filtered vacuuming equipment shall be used for vacuuming. The equipment shall be used and emptied in a manner which minimizes the re-entry of asbestos into the workplace.

(5) Shoveling, dry sweeping, and dry clean-up of asbestos may be used only where vacuuming and/or wet cleaning are not feasible.

(6) Waste disposal. Waste, scrap, debris, bags, containers, equipment, and clothing contaminated with asbestos consigned for disposal, shall be collected and disposed of in sealed impermeable bags, or other closed, impermeable containers. To avoid breakage, bags shall be at least six mils in thickness and shall not be dragged or slid across rough or abrasive surfaces.

(7) Waste removal. Whenever a negative-pressure enclosure is required by WAC 296-62-07712, the employer wherever feasible, shall establish a waste-load-out area that is adjacent and connected to the negative-pressure enclosure, constructed of a two chamber air lock, for the decontamination and removal of asbestos debris.

(8) Deterioration. Asbestos and asbestos containing material which has become damaged or deteriorated shall be repaired, enclosed, encapsulated, or removed.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07723, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07723, filed 4/27/87.]

WAC 296-62-07725 Medical surveillance. (1) General.

(a) Employees covered. The employer shall institute a medical surveillance program for all employees who are or will be exposed to airborne concentrations of fibers of asbestos at or above the action level. Exception. Employers in the construction industry shall institute a medical surveillance program for all employees engaged in work involving levels of asbestos at or above the action level for thirty or more days per year, or who are required by this section to wear negative-pressure respirators.

(b) Examination by a physician.

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

(ii) Persons other than licensed physicians, who administer the pulmonary function testing required by this section, shall complete a training course in spirometry sponsored by an appropriate academic or professional institution.

(2) Placement examinations.

(a) Except as provided by WAC 296-62-07725 (1)(a), before an employee is assigned to an occupation exposed to airborne concentrations of asbestos, a pre-placement medical examination shall be provided or made available by the employer. Examinations administered using the thirty or more days per year criteria of WAC 296-62-07725 (1)(a) shall be given within ten working days following the thirtieth day of exposure. Examinations must be given prior to assignment of employees to areas where negative-pressure respirators are worn.

(b) All examinations shall include, as a minimum, a medical and work history: A complete physical examination of all systems with special emphasis on the pulmonary, cardiovascular, and gastrointestinal systems; completion of the respiratory disease standardized questionnaire in WAC 296-62-07741, Appendix D, Part 1; a chest roentgenogram (posterior-anterior 14x17 inches); pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second (FEV_{1.0}); and any additional tests deemed appropriate by the examining physician. Interpretation and classification of chest roentgenograms shall be conducted in accordance with WAC 296-62-07743, Appendix E.

(3) Periodic examinations.

(a) Periodic medical examinations shall be made available annually.

(b) The scope of the medical examination shall be in conformance with the protocol established in subsection (2)(b) of this section, except that the frequency of chest roentgenograms shall be conducted in accordance with Table 2 of this section, and the abbreviated standardized questionnaire contained in WAC 296-62-07741, Appendix D, Part 2, shall be administered to the employee.

TABLE 2—FREQUENCY OF CHEST ROENTGENOGRAMS

Years since first exposure	Age of employee		
	15 to 35	35+ to 45	45+
0 to 10.....	Every 5 years	Every 5 years	Every 5 years.
10+	Every 5 years	Every 2 years	Every 1 year.

(c) If the examining physician determines that any of the examinations should be provided more frequently than specified, the employer shall provide such examinations to affected employees at the frequencies specified by the physician.

(4) Termination of employment examinations.

(a) The employer shall provide, or make available, a termination of employment medical examination for any employee who has been exposed to airborne concentrations of fibers of asbestos at or above the action level.

(b) The medical examination shall be in accordance with the requirements of the periodic examinations stipulated in subsection (3) of this section, and shall be given within thirty calendar days before or after the date of termination of employment.

(5) Recent examinations. No medical examination is required of any employee, if adequate records show that the employee has been examined in accordance with subsection (2), (3), or (4) of this section within the past one-year period.

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

(a) A copy of this standard and Appendices D, E, and H of WAC 296-62-07741, 296-62-07743, and 296-62-07749 respectively.

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

(c) The employee's representative exposure level or anticipated exposure level.

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

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

(7) Physician's written opinion.

(a) The employer shall obtain a written signed opinion from the examining physician. This written opinion shall contain the results of the medical examination and shall include:

(i) The physician's opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of material health impairment from exposure to asbestos;

(ii) Any recommended limitations on the employee or upon the use of personal protective equipment such as clothing or respirators; and

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

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

(c) The employer shall provide a copy of the physician's written opinion to the affected employee within thirty days from its receipt.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07725, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07725, filed 4/27/87.]

WAC 296-62-07727 Recordkeeping. (1) Exposure measurements.

(a) The employer shall keep an accurate record of all measurements taken to monitor employee exposure to asbestos as prescribed in WAC 296-62-07709.

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

(i) Name of employer;

(ii) Name of person conducting monitoring;

(iii) The date of measurement;

(iv) Address of operation or activity;

(v) Description of the operation or activity involving exposure to asbestos that is being monitored;

(vi) Personal or area sample;

(vii) Name, Social Security number, and exposure level of the employees whose exposures are represented;

(viii) Type of protective devices worn, if any;

(ix) Pump calibration date and flow rate;

(x) Total volume of air sampled;

(xi) Name and address of analytical laboratory;

(xii) Number, duration, and results (f/cc) of samples taken;

(xiii) Date of analysis; and

(xiv) Sampling and analytical methods used and evidence of their accuracy.

(c) The employer shall maintain this record for the duration of employment plus thirty years, in accordance with WAC 296-62-052.

(2) Objective data for exempted operations.

(a) Where the processing, use, or handling of products made from or containing asbestos is exempted from other requirements of this section under WAC 296-62-07709 (2)(c), the employer shall establish and maintain an accurate record of objective data reasonably relied upon in support of the exemption.

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

(i) The product qualifying for exemption;

(ii) The source of the objective data;

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

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

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

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

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

(3) Medical surveillance.

(a) The employer shall establish and maintain an accurate record for each employee subject to medical surveillance by WAC 296-62-07725 (1)(a), in accordance with WAC 296-62-052.

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

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

(ii) Physician's written opinions;

(iii) Any employee medical complaints related to exposure to asbestos;

(iv) A copy of the information provided to the physician as required by WAC 296-62-07725(6); and

(v) A copy of the employee's medical examination results, including the medical history, questionnaire responses, results of any tests, and physicians recommendations.

(c) The employer shall ensure that this record is maintained for the duration of employment plus thirty years, in accordance with WAC 296-62-052.

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

(5) Availability.

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

(b) The employer, upon request, shall make any exposure records required by subsection (1) of this section available for examination and copying to affected employees, former employees, designated representatives, and the director, in accordance with WAC 296-62-05201 through 296-62-05209 and 296-62-05213 through 296-62-05217.

(c) The employer, upon request, shall make employee medical records required by subsection (2) of this section available for examination and copying to the subject employee, to anyone having the specific written consent of the subject employee, and the director, in accordance with WAC 296-62-052.

(6) Transfer of records.

(a) The employer shall comply with the requirements concerning transfer of records set forth in WAC 296-62-05215.

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

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07727, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07727, filed 4/27/87.]

WAC 296-62-07729 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-62-07731 Dates. (1) The requirements of the asbestos standard issued in May 1973, as amended, and published in WAC 296-62-07517, remain in effect until compliance is achieved with the parallel provisions of WAC 296-62-077 through 296-62-07753.

(2) Start-up dates. All obligations of WAC 296-62-077 through 296-62-07753 commence on the effective date except as follows:

(a) Hygiene and lunchroom facilities. Changerooms, showers, lavatories, and lunchroom facilities shall be constructed and in use no later than July 20, 1987. However, if as part of the compliance plan for a fixed facility as opposed to mobile or construction type activities it is predicted by an independent engineering firm that engineering controls and work practices will reduce exposures below the permissible exposure limit by July 20, 1988, for affected employees, then such facilities need not be completed until one year after the engineering controls are completed, if such controls have not in fact succeeded in reducing exposure to below the permissible exposure limit.

(b) Compliance program. Written compliance programs required by WAC 296-62-07713(2) as a result of initial monitoring shall be completed and available for inspection and copying as soon as possible but no later than July 20, 1987.

(c) Methods of compliance. The engineering and work practice controls as required by WAC 296-62-07713(1)

shall be implemented as soon as possible but no later than July 20, 1988.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07731, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07731, filed 4/27/87.]

WAC 296-62-07733 Appendices. (1) The following appendices to this chapter are mandatory.

(a) WAC 296-62-07735, Appendix A—WISHA reference method—Mandatory.

(b) WAC 296-62-07739, Appendix C—Qualitative and quantitative fit testing procedures—Mandatory.

(c) WAC 296-62-07741, Appendix D—Medical questionnaires—Mandatory.

(d) WAC 296-62-07743, Appendix E—Interpretation and classification of chest roentgenograms—Mandatory.

(2) The following appendices to this section are informational and are not intended to create any additional obligations not otherwise imposed or to detract from any existing obligations.

(a) WAC 296-62-07737, Appendix B—Detailed procedure for asbestos sampling and analysis—Nonmandatory.

(b) WAC 296-62-07745, Appendix F—Work practices and engineering controls for automotive brake repair operations—Nonmandatory.

(c) WAC 296-62-07747, Appendix G—Substance technical information for asbestos—Nonmandatory.

(d) WAC 296-62-07749, Appendix H—Medical surveillance guidelines for asbestos—Nonmandatory.

(e) WAC 296-62-07751, Appendix I—Work practices and engineering controls for major asbestos removal, renovation, and demolition operations—Nonmandatory.

(f) WAC 296-62-07753, Appendix J—Work practices and engineering controls for small-scale, short-duration asbestos renovation and maintenance activities—Nonmandatory.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07733, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07733, filed 4/27/87.]

WAC 296-62-07735 Appendix A—WISHA reference method—Mandatory. This mandatory appendix specifies the procedure for analyzing air samples for asbestos and specifies quality control procedures that must be implemented by laboratories performing the analysis. The sampling and analytical methods described below represent the elements of the available monitoring methods (such as the NIOSH 7400 method) which WISHA considers to be essential to achieve adequate employee exposure monitoring while allowing employers to use methods that are already established within their organizations. All employers who are required to conduct air monitoring under WAC 296-62-07709 are required to utilize analytical laboratories that use this procedure, or an equivalent method recognized by the department, for collecting and analyzing samples.

(1) Sampling and analytical procedure.

(a) The sampling medium for air samples shall be mixed cellulose ester filter membranes. These shall be designated by the manufacturer as suitable for asbestos counting. See below for rejection of blanks.

(b) The preferred collection device shall be the 25-mm diameter cassette with an open-faced 50-mm electrically conductive extension cowl. The 37-mm cassette may be used if necessary but only if written justification for the need to use the 37-mm filter cassette accompanies the sample results in the employee's exposure monitoring record.

(c) An air flow rate between 0.5 liter/min and 4.0 liters/min shall be selected for the 25-mm cassette. If the 37-mm cassette is used, an air flow rate between 1 liter/min and 4.0 liters/min shall be selected.

(d) Where possible, a sufficient air volume for each air sample shall be collected to yield between one hundred and one thousand three hundred fibers per square millimeter on the membrane filter. If a filter darkens in appearance or if loose dust is seen on the filter, a second sample shall be started.

(e) Ship the samples in a rigid container with sufficient packing material to prevent dislodging the collected fibers. Packing material that has a high electrostatic charge on its surface (e.g., expanded polystyrene) cannot be used because such material can cause loss of fibers to the sides of the cassette.

(f) Calibrate each personal sampling pump before and after use with a representative filter cassette installed between the pump and the calibration devices.

(g) Personal samples shall be taken in the "breathing zone" of the employee (i.e., attached to or near the collar or lapel near the worker's face).

(h) Fiber counts shall be made by positive phase contrast using a microscope with an 8 to 10 X eyepiece and a 40 to 45 X objective for a total magnification of approximately 400 X and a numerical aperture of 0.65 to 0.75. The microscope shall also be fitted with a green or blue filter.

(i) The microscope shall be fitted with a Walton-Beckett eyepiece graticule calibrated for a field diameter of one hundred micrometers (+/-2 micrometers).

(j) The phase-shift detection limit of the microscope shall be about 3 degrees measured using the HSE phase shift test slide as outlined below.

(i) Place the test slide on the microscope stage and center it under the phase objective.

(ii) Bring the blocks of grooved lines into focus.

Note: The slide consists of seven sets of grooved lines (ca. 20 grooves to each block) in descending order of visibility from sets one to seven, seven being the least visible. The requirements for asbestos counting are that the microscope optics must resolve the grooved lines in set three completely, although they may appear somewhat faint, and that the grooved lines in sets six and seven must be invisible. Sets four and five must be at least partially visible but may vary slightly in visibility between microscopes. A microscope that fails to meet these requirements has either too low or too high a resolution to be used for asbestos counting.

(iii) If the image deteriorates, clean and adjust the microscope optics. If the problem persists, consult the microscope manufacturer.

(k) Each set of samples taken will include ten percent blanks or a minimum of two blanks. The blank results shall be averaged and subtracted from the analytical results before reporting. Any samples represented by a blank having a fiber count in excess of seven fibers/one hundred fields shall be rejected.

(l) The samples shall be mounted by the acetone/triacetin method or a method with an equivalent index of refraction and similar clarity.

(m) Observe the following counting rules.

(i) Count only fibers equal to or longer than five micrometers. Measure the length of curved fibers along the curve.

(ii) In the absence of other information, count all particles as asbestos that have a length-to-width ratio (aspect ratio) of three to one or greater.

(iii) Fibers lying entirely within the boundary of the Walton-Beckett graticule field shall receive a count of one. Fibers crossing the boundary once, having one end within the circle, shall receive the count of one-half. Do not count any fiber that crosses the graticule boundary more than once. Reject and do not count any other fibers even though they may be visible outside the graticule area.

(iv) Count bundles of fibers as one fiber unless individual fibers can be identified by observing both ends of an individual fiber.

(v) For a 25mm filter, count enough graticule fields to yield one hundred fibers by counting a minimum of twenty fields. If less than ten fibers are found after counting one hundred fields and the sample air volume is less than sixty liters, count a total number of fields calculated from the following formulas:

$$\begin{array}{ll} N = 6000/V & \text{For TWA Determination (QL = 0.085)} \\ N = 2400/V & \text{For Ceiling Determinations (QL = 0.21)} \end{array}$$

Where N = Number of fields counted on a 25mm filter
V = Air volume of sample in liters
QL = Limit of reliable quantification in fibers/cc for the NIOSH 7400 method

Note: Filter samples (25mm) with air volumes of less than thirty liters will have decreased analytical accuracy and precision and should be avoided.

(vi) For a 37mm filter, count enough graticule fields to yield one hundred fibers by counting a minimum of twenty fields. If less than one hundred fibers are found after counting one hundred fields and the sample air volume is less than one hundred thirty-three liters, count a total number of fields calculated from the following formulas:

$$\begin{array}{ll} N = 13300/V & \text{For TWA Determination (QL = 0.085)} \\ N = 5320/V & \text{For Ceiling Determinations (QL = 0.21)} \end{array}$$

Where N = Number of fields counted on a 37mm filter
V = Air volume of sample in liters
QL = Limit of reliable quantification in fibers/cc

Note: Filter samples (37mm) with air volumes of less than seventy liters will have decreased analytical accuracy and precision and should be avoided.

(n) Blind recounts shall be conducted at the rate of ten percent.

(2) Quality control procedures.

(a) Intralaboratory program. Each laboratory and/or each company with more than one microscopist counting

slides shall establish a statistically designed quality assurance program involving blind recounts and comparisons between microscopists to monitor the variability of counting by each microscopist and between microscopists. In a company with more than one laboratory, the program shall include all laboratories and shall also evaluate the laboratory-to-laboratory variability.

(b) Interlaboratory program. Each laboratory analyzing asbestos samples for compliance determination shall implement an interlaboratory quality assurance program that as a minimum includes participation of at least two other independent laboratories. Each laboratory shall participate in round robin testing at least once every six months with at least all the other laboratories in its interlaboratory quality assurance group. Each laboratory shall submit slides typical of its own work load for use in this program. The round robin shall be designed and results analyzed using appropriate statistical methodology.

(c) All individuals performing asbestos analysis must have taken the NIOSH course for sampling and evaluating airborne asbestos dust or an equivalent course, recognized by the department.

(d) When the use of different microscopes contributes to differences between counters and laboratories, the effect of the different microscope shall be evaluated and the microscope shall be replaced, as necessary.

(e) Current results of these quality assurance programs shall be posted in each laboratory to keep the microscopists informed.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07735, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07735, filed 4/27/87.]

WAC 296-62-07737 Appendix B--Detailed procedure for asbestos sampling and analysis--Nonmandatory. This appendix contains a detailed procedure for sampling and analysis and includes those critical elements specified in WAC 296-62-07735, Appendix A. Employers are not required to use this procedure, but they are required to use Appendix A. The purpose of Appendix B is to provide a detailed step-by-step sampling and analysis procedure that conforms to the elements specified in WAC 296-62-07735, Appendix A. Since this procedure may also standardize the analysis and reduce variability, WISHA encourages employers to use this appendix.

Asbestos Sampling and Analysis Method

Technique: Microscopy, phase contrast.

Analyte: Fibers (manual count).

Sample preparation: Acetone/triacetin method.

Calibration: Phase-shift detection limit about three degrees.

Range: One hundred to one thousand three hundred fibers/mm²filter area.

Estimated limit of detection: Seven fibers/mm²filter area.

Sampler: Filter (0.8-1.2 um mixed cellulose ester membrane, 25-mm diameter).

Flow rate: 0.5 L/min to 4.0 L/min (25-mm cassette)
1.0 L/min to 4.0 L/min (37-mm cassette).

Sample volume: Adjust to obtain one hundred to one thousand three hundred fibers/mm².

Shipment: Routine.

Sample stability: Indefinite.

Blanks: Ten percent of samples (minimum two).

Standard analytical error: 0.25.

Applicability: The working range is 0.02 f/cc (1920-L air sample) to 1.25 f/cc (400-L air sample). The method gives an index of airborne asbestos fibers but may be used for other materials such as fibrous glass by inserting suitable parameters into the counting rules. The method does not differentiate between asbestos and other fibers. Asbestos fibers less than ca. 0.25 um diameter will not be detected by this method.

Interferences: Any other airborne fiber may interfere since all particles meeting the counting criteria are counted. Chain-like particles may appear fibrous. High levels of nonfibrous dust particles may obscure fibers in the field of view and raise the detection limit.

(1) Reagents.

(a) Acetone.

(b) Triacetin (glycerol triacetate), reagent grade.

Special precautions: Acetone is an extremely flammable liquid and precautions must be taken not to ignite it. Heating of acetone must be done in a ventilated laboratory fume hood using a flameless, spark-free heat source.

(2) Equipment.

(a) Collection device: 25-mm cassette with 50-mm electrically conductive extension cowl with cellulose ester filter, 0.8 to 1.2 mm pore size and backup pad.

Note: Analyze representative filters for fiber background before use and discard the filter lot if more than five fibers/one hundred fields are found.

(b) Personal sampling pump, greater than or equal to 0.5 L/min. with flexible connecting tubing.

(c) Microscope, phase contrast, with green or blue filter, 8 to 10 X eyepiece, and 40 to 45 X phase objective (total magnification ca. 400 X); numerical aperture = 0.65 to 0.75.

(d) Slides, glass, single-frosted, precleaned, 25 x 75 mm.

(e) Cover slips, 25 x 25 mm, No. 1 1/2 unless otherwise specified by microscope manufacturer.

(f) Knife, No. 1 surgical steel, curved blade.

(g) Tweezers.

(h) Flask, Guth-type, insulated neck, 250 to 500 mL (with single-hole rubber stopper and elbow-jointed glass tubing, 16 to 22 cm long).

(i) Hotplate, spark-free, stirring type; heating mantle; or infrared lamp and magnetic stirrer.

(j) Syringe, hypodermic, with 22-gauge needle.

(k) Graticule, Walton-Beckett type with 100 um diameter circular field at the specimen plane (area = 0.00785 mm²), (Type G-22).

Note: The graticule is custom-made for each microscope.

(l) HSE/NPL phase contrast test slide, Mark II.

(m) Telescope, ocular phase-ring centering.

(n) Stage micrometer (0.01 mm divisions).

(3) Sampling.

(a) Calibrate each personal sampling pump with a representative sampler in line.

(b) Fasten the sampler to the worker's lapel as close as possible to the worker's mouth. Remove the top cover from the end of the cowl extension (open face) and orient face down. Wrap the joint between the extender and the monitor's body with shrink tape to prevent air leaks.

(c) Submit at least two blanks (or ten percent of the total samples, whichever is greater) for each set of samples. Remove the caps from the field blank cassettes and store the caps and cassettes in a clean area (bag or box) during the sampling period. Replace the caps in the cassettes when sampling is completed.

(d) Sample at 0.5 L/min or greater. Do not exceed 1 mg total dust loading on the filter. Adjust sampling flow rate, Q (L/min), and time to produce a fiber density, E (fibers/mm²), of one hundred to one thousand three hundred fibers/mm² (3.85×10^4 to 5×10^5 fibers per 25-mm filter with effective collection area ($A_c=385$ mm²)) for optimum counting precision (see subsection (7)(a) of this section). Calculate the minimum sampling time, T (minutes) at the action level (one-half of the current standard), L (f/cc) of the fibrous aerosol being sampled:

$$T = \frac{(A_c)(E)}{(Q)(L)10^3}$$

(e) Remove the field monitor at the end of sampling, replace the plastic top cover and small end caps, and store the monitor.

(f) Ship the samples in a rigid container with sufficient packing material to prevent jostling or damage.

Note: Do not use polystyrene foam in the shipping container because of electrostatic forces which may cause fiber loss from the sample filter.

(4) Sample preparation.

Note: The object is to produce samples with a smooth (nongrainy) background in a medium with a refractive index equal to or less than 1.46. The method below collapses the filter for easier focusing and produces permanent mounts which are useful for quality control and interlaboratory comparison. Other mounting techniques meeting the above criteria may also be used, e.g., the nonpermanent field mounting technique used in P & CAM 239.

(a) Ensure that the glass slides and cover slips are free of dust and fibers.

(b) Place 40 to 60 ml of acetone into a Guth-type flask. Stopper the flask with a single-hole rubber stopper through which a glass tube extends 5 to 8 cm into the flask. The portion of the glass tube that exits the top of the stopper (8 to ten cm) is bent downward in an elbow that makes an angle of twenty to thirty degrees with the horizontal.

(c) Place the flask in a stirring hotplate or wrap in a heating mantle. Heat the acetone gradually to its boiling temperature (ca. 58°C).

Caution: The acetone vapor must be generated in a ventilated fume hood away from all open flames and spark sources. Alternate heating methods can be used, providing no open flame or sparks are present.

(d) Mount either the whole sample filter or a wedge cut from the sample filter on a clean glass slide.

(i) Cut wedges of ca. twenty-five percent of the filter area with a curved-blade steel surgical knife using a rocking motion to prevent tearing.

(ii) Place the filter or wedge, dust slide up, on the slide. Static electricity will usually keep the filter on the slide until it is cleared.

(iii) Hold the glass slide supporting the filter approximately 1 to 2 cm from the glass tube port where the acetone vapor is escaping from the heated flask. The acetone vapor stream should cause a condensation spot on the glass slide ca. 2 to 3 cm in diameter. Move the glass slide gently in the vapor stream. The filter should clear in two to five seconds. If the filter curls, distorts, or is otherwise rendered unusable, the vapor stream is probably not strong enough. Periodically wipe the outlet port with tissue to prevent liquid acetone dripping onto the filter.

(iv) Using the hypodermic syringe with a 22-gauge needle, place one to two drops of triacetin on the filter. Gently lower a clean 25-mm square cover slip down onto the filter at a slight angle to reduce the possibility of forming bubbles. If too many bubbles form or the amount of triacetin is insufficient, the cover slip may become detached within a few hours.

(v) Glue the edges of the cover slip to the glass slide using a lacquer or nail polish.

Note: If clearing is slow, the slide preparation may be heated on a hotplate (surface temperature 50°C) for fifteen minutes to hasten clearing. Counting may proceed immediately after clearing and mounting are completed.

(5) Calibration and quality control.

(a) Calibration of the Walton-Beckett graticule. The diameter, d_c (mm), of the circular counting area and the disc diameter must be specified when ordering the graticule.

(i) Insert any available graticule into the eyepiece and focus so that the graticule lines are sharp and clear.

(ii) Set the appropriate interpupillary distance and, if applicable, reset the binocular head adjustment so that the magnification remains constant.

(iii) Install the 40 to 45 X phase objective.

(iv) Place a stage micrometer on the microscope object stage and focus the microscope on the graduated lines.

(v) Measure the magnified grid length, L_o (um) using the stage micrometer.

(vi) Remove the graticule from the microscope and measure its actual grid length, L_a (mm). This can best be accomplished by using a stage fitted with verniers.

(vii) Calculate the circle diameter, d_c (mm), for the Walton-Beckett graticule:

$$d_c = \frac{L_a \times D}{L_o}$$

Example: If $L_o = 108$ um, $L_a = 2.93$ mm and $D = 100$ um, then $d_c = 2.71$ mm.

(viii) Check the field diameter, D (acceptable range 100 mm \pm 2 mm) with a stage micrometer upon receipt

of the graticule from the manufacturer. Determine field area (mm^2).

(b) Microscope adjustments. Follow the manufacturer's instructions and also the following:

(i) Adjust the light source for even illumination across the field of view at the condenser iris.

Note: Kohler illumination is preferred, where available.

(ii) Focus on the particulate material to be examined.

(iii) Make sure that the field iris is in focus, centered on the sample, and open only enough to fully illuminate the field of view.

(iv) Use the telescope ocular supplied by the manufacturer to ensure that the phase rings (annular diaphragm and phase-shifting elements) are concentric.

(c) Check the phase-shift detection limit of the microscope periodically.

(i) Remove the HSE/NPL phase-contrast test slide from its shipping container and center it under the phase objective.

(ii) Bring the blocks of grooved lines into focus.

Note: The slide consists of seven sets of grooves (ca. 20 grooves to each block) in descending order of visibility from sets one to seven. The requirements for counting are that the microscope optics must resolve the grooved lines in set three completely, although they may appear somewhat faint, and that the grooved lines in sets six to seven must be invisible. Sets four and five must be at least partially visible but may vary slightly in visibility between microscopes. A microscope which fails to meet these requirements has either too low or too high a resolution to be used for asbestos, tremolite, anthophyllite, and actinolite counting.

(iii) If the image quality deteriorates, clean the microscope optics and, if the problem persists, consult the microscope manufacturer.

(d) Quality control of fiber counts.

(i) Prepare and count field blanks along with the field samples. Report the counts on each blank. Calculate the mean of the field blank counts and subtract this value from each sample count before reporting the results.

Note 1: The identity of the blank filters should be unknown to the counter until all counts have been completed.

Note 2: If a field blank yields fiber counts greater than seven fibers/one hundred fields, report possible contamination of the samples.

(ii) Perform blind recounts by the same counter on ten percent of filters counted (slides relabeled by a person other than the counter).

(e) Use the following test to determine whether a pair of counts on the same filter should be rejected because of possible bias. This statistic estimates the counting repeatability at the ninety-five percent confidence level. Discard the sample if the difference between the two counts exceeds $2.77(F)S_r$, where F = average of the two fiber counts and S_r = relative standard deviation, which should be derived by each laboratory based on historical in-house data.

Note: If a pair of counts is rejected as a result of this test, recount the remaining samples in the set and test the new counts against the first counts. Discard all rejected paired counts.

(f) Enroll each new counter in a training course that compares performance of counters on a variety of samples using this procedure.

Note: To ensure good reproducibility, all laboratories engaged in asbestos counting are required to participate in the proficiency analytical testing (PAT) program and should routinely participate with other asbestos fiber counting laboratories in the exchange of field samples to compare performance of counters.

(6) Measurement.

(a) Place the slide on the mechanical stage of the calibrated microscope with the center of the filter under the objective lens. Focus the microscope on the plane of the filter.

(b) Regularly check phase-ring alignment and Kohler illumination.

(c) The following are the counting rules:

(i) Count only fibers 5 μm or longer in length. Measure the length of curved fibers along the curve.

(ii) Count only fibers with a length-to-width ratio equal to or greater than three to one.

(iii) For fibers that cross the boundary of the graticule field, do the following:

(A) Count any fiber 5 μm or longer in length that lies entirely within the graticule area.

(B) Count as one-half fiber any fiber with only one end lying within the graticule area.

(C) Do not count any fiber that crosses the graticule boundary more than once.

(D) Reject and do not count all other fibers.

(iv) Count bundles of fibers as one fiber unless individual fibers can be identified by observing both ends of a fiber.

(v) For a 25mm filter, count enough graticule fields to yield one hundred fibers by counting a minimum of twenty fields. If less than ten fibers are found after counting one hundred fields and the sample air volume is less than sixty liters, count a total number of fields calculated from the following formulas:

$$\begin{aligned} N &= 6000/V && \text{For TWA Determination (QL = 0.085)} \\ N &= 2400/V && \text{For Ceiling Determinations (QL = 0.21)} \end{aligned}$$

Where N = Number of fibers counted on a 25mm filter
 V = Air volume of sample in liters
 QL = Limit of reliable quantification in fibers/cc for the NIOSH 7400 method

Note: Filter samples (25mm) with air volumes of less than thirty liters will have decreased analytical accuracy and precision and should be avoided.

(vi) For a 37mm filter, count enough graticule fields to yield one hundred fibers by counting a minimum of twenty fields. If less than one hundred fibers are found after counting one hundred fields and the sample air volume is less than one hundred thirty-three liters, count a total number of fields calculated from the following formulas:

$$\begin{aligned} N &= 13300/V && \text{For TWA Determination (QL = 0.085)} \\ N &= 5320/V && \text{For Ceiling Determinations (QL = 0.21)} \end{aligned}$$

Where N = Number of fields counted on a 37mm filter
 V = Air volume of sample in liters
 QL = Limit of reliable quantification in fibers/cc

Note: Filter samples (37mm) with air volumes of less than seventy liters will have decreased analytical accuracy and precision and should be avoided.

(d) Start counting from one end of the filter and progress along a radial line to the other end, shift either up or down on the filter, and continue in the reverse direction. Select fields randomly by looking away from the eyepiece briefly while advancing the mechanical stage. When an agglomerate covers ca. 1/6 or more of the field of view, reject the field and select another. Do not report rejected fields in the number of total fields counted.

Note: When counting a field, continuously scan a range of focal planes by moving the fine focus knob to detect very fine fibers which have become embedded in the filter. The small-diameter fibers will be very faint but are an important contribution to the total count.

(7) Calculations.

(a) Calculate and report fiber density on the filter, E (fibers/mm²); by dividing the total fiber count, F; minus the mean field blank count, B, by the number of fields, n; and the field area, A_f(0.00785 mm² for a properly calibrated Walton-Beckett graticule):

$$E = \frac{(F/n_f) - (B/n_b)}{(A_f)} \text{ fibers/mm}^2$$

Where: n_f = number of fields in submission sample

n_b = number of fields in blank sample

(b) Calculate the concentration, C (f/cc), of fibers in the air volume sampled, V (L), using the effective collection area of the filter, A_c(385 mm² for a 25-mm filter):

$$C = \frac{(E)(A_c)}{V(10^3)}$$

Note: Periodically check and adjust the value of A_c, if necessary.

Bulk sample collection and analysis.

Bulk samples should be collected as specified in Appendix G, Section 1 of the United States Environmental Protection Agency (EPA) publication No. 560/5-85-024 (June 1985) entitled *Guidance for Controlling Asbestos-Containing Materials in Buildings*.

Analysis of the samples should be conducted by polarizing light microscopy in a qualified laboratory. In certain cases, x-ray diffraction may be required to confirm the presence of asbestos. Qualified laboratories must be participants in the EPA bulk asbestos quality assurance program or other bulk asbestos quality assurance program recognized by the department.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07737, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07737, filed 4/27/87.]

WAC 296-62-07739 Appendix C—Qualitative and quantitative fit testing procedures—Mandatory. (1) Qualitative fit test protocols.

(a) Isoamyl acetate protocol.

(i) Odor threshold screening:

(A) Three one-liter glass jars with metal lids (e.g., Mason or Ball jars) are required.

(B) Odor free water (e.g., distilled or spring water) at approximately 25°C shall be used for the solutions.

(C) The isoamyl acetate (IAA) (also known as isopentyl acetate) stock solution is prepared by adding

one cc of pure IAA to eight hundred cc of odor free water in a one-liter jar and shaking for thirty seconds. This solution shall be prepared new at least weekly.

(D) The screening test shall be conducted in a room separate from the room used for actual fit testing. The two rooms shall be well ventilated but shall not be connected to the same recirculating ventilation system.

(E) The odor test solution is prepared in a second jar by placing 0.4 cc of the stock solution into five hundred cc of odor free water using a clean dropper or pipette. Shake for thirty seconds and allow to stand for two to three minutes so that the IAA concentration above the liquid may reach equilibrium. This solution may be used for only one day.

(F) A test blank is prepared in a third jar by adding five hundred cc of odor free water.

(G) The odor test and test blank jars shall be labelled one and two for jar identification. If the labels are put on the lids they can be periodically peeled, dried off and switched to maintain the integrity of the test.

(H) The following instructions shall be typed on a card and placed on the table in front of the two test jars (i.e., one and two): "The purpose of this test is to determine if you can smell banana oil at a low concentration. The two bottles in front of you contain water. One of these bottles also contains a small amount of banana oil. Be sure the covers are on tight, then shake each bottle for two seconds. Unscrew the lid of each bottle, one at a time, and sniff at the mouth of the bottle. Indicate to the test conductor which bottle contains banana oil."

(I) The mixtures used in the IAA odor detection test shall be prepared in an area separate from where the test is performed, in order to prevent olfactory fatigue in the subject.

(J) If the test subject is unable to correctly identify the jar containing the odor test solution, the IAA qualitative fit test may not be used.

(K) If the test subject correctly identifies the jar containing the odor test solution, the test subject may proceed to respirator selection and fit testing.

(ii) Respirator selection.

(A) The test subject shall be allowed to pick the most comfortable respirator from a selection including respirators of various sizes from different manufacturers. The selection shall include at least five sizes of elastomeric half facepieces, from at least two manufacturers.

(B) The selection process shall be conducted in a room separate from the fit-test chamber to prevent odor fatigue. Prior to the selection process, the test subject shall be shown how to put on a respirator, how it should be positioned on the face, how to set strap tension and how to determine a "comfortable" respirator. A mirror shall be available to assist the subject in evaluating the fit and positioning of the respirator. This instruction may not constitute the subject's formal training on respirator use, as it is only a review.

(C) The test subject should understand that the employee is being asked to select the respirator which provides the most comfortable fit. Each respirator represents a different size and shape and, if fit properly and used properly will provide adequate protection.

(D) The test subject holds each facepiece up to the face and eliminates those which obviously do not give a comfortable fit. Normally, selection will begin with a half-mask and if a good fit cannot be found, the subject will be asked to test the full facepiece respirators. (A small percentage of users will not be able to wear any half-mask.)

(E) The more comfortable facepieces are noted; the most comfortable mask is donned and worn at least five minutes to assess comfort. All donning and adjustments of the facepiece shall be performed by the test subject without assistance from the test conductor or other person. Assistance in assessing comfort can be given by discussing the points in (a)(ii)(F) of this subsection. If the test subject is not familiar with using a particular respirator, the test subject shall be directed to don the mask several times and to adjust the straps each time to become adept at setting proper tension on the straps.

(F) Assessment of comfort shall include reviewing the following points with the test subject and allowing the test subject adequate time to determine the comfort of the respirator:

- (I) Positioning of mask on nose.
- (II) Room for eye protection.
- (III) Room to talk.
- (IV) Positioning mask on face and cheeks.

(G) The following criteria shall be used to help determine the adequacy of the respirator fit:

- (I) Chin properly placed.
- (II) Strap tension.
- (III) Fit across nose bridge.
- (IV) Distance from nose to chin.
- (V) Tendency to slip.
- (VI) Self-observation in mirror.

(H) The test subject shall conduct the conventional negative and positive-pressure fit checks before conducting the negative- or positive-pressure test the subject shall be told to "seat" the mask by rapidly moving the head from side-to-side and up and down, while taking a few deep breaths.

(I) The test subject is now ready for fit testing.

(J) After passing the fit test, the test subject shall be questioned again regarding the comfort of the respirator. If it has become uncomfortable, another model of respirator shall be tried.

(K) The employee shall be given the opportunity to select a different facepiece and be retested if the chosen facepiece becomes increasingly uncomfortable at any time.

(iii) Fit test.

(A) The fit test chamber shall be similar to a clear fifty-five gallon drum liner suspended inverted over a two-foot diameter frame, so that the top of the chamber is about six inches above the test subject's head. The inside top center of the chamber shall have a small hook attached.

(B) Each respirator used for the fitting and fit testing shall be equipped with organic vapor cartridges or offer protection against organic vapors. The cartridges or masks shall be changed at least weekly.

(C) After selecting, donning, and properly adjusting a respirator, the test subject shall wear it to the fit testing room. This room shall be separate from the room used for odor threshold screening and respirator selection, and shall be well ventilated, as by an exhaust fan or lab hood, to prevent general room contamination.

(D) A copy of the following test exercises and "rainbow passage" shall be taped to the inside of the test chamber:

Test exercises.

(I) Breathe normally.

(II) Breathe deeply. Be certain breaths are deep and regular.

(III) Turn head all the way from one side to the other. Inhale on each side. Be certain movement is complete. Do not bump the respirator against the shoulders.

(IV) Nod head up and down. Inhale when head is in the full up position (looking toward ceiling). Be certain motions are complete and made about every second. Do not bump the respirator on the chest.

(V) Talking. Talk aloud and slowly for several minutes. The following paragraph is called the "rainbow passage." Reading it will result in a wide range of facial movements, and thus be useful to satisfy this requirement. Alternative passages which serve the same purpose may also be used.

(VI) Jogging in place.

(VII) Breathe normally.

"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.

(E) Each test subject shall wear the respirator for at least ten minutes before starting the fit test.

(F) Upon entering the test chamber, the test subject shall be given a six-inch by five-inch piece of paper towel or other porous absorbent single ply material, folded in half and wetted with three-quarters of one cc of pure IAA. The test subject shall hang the wet towel on the hook at the top of the chamber.

(G) Allow two minutes for the IAA test concentration to be reached before starting the fit-test exercises. This would be an appropriate time to talk with the test subject, to explain the fit test, the importance of cooperation, the purpose for the head exercises, or to demonstrate some of the exercises.

(H) Each exercise described in (D) of this subsection shall be performed for at least one minute.

(I) If at any time during the test, the subject detects the banana-like odor of IAA, the test has failed. The subject shall quickly exit from the test chamber and leave the test area to avoid olfactory fatigue.

(J) If the test is failed, the subject shall return to the selection room and remove the respirator, repeat the

odor sensitivity test, select and put on another respirator, return to the test chamber, and again begin the procedure described in (b)(iii)(D) through (H) of this subsection. The process continues until a respirator that fits well has been found. Should the odor sensitivity test be failed, the subject shall wait about five minutes before retesting. Odor sensitivity will usually have returned by this time.

(K) If a person cannot pass the fit test described above wearing a half-mask respirator from the available selection, full facepiece models must be used.

(L) When a respirator is found that passes the test, the subject breaks the facesal and takes a breath before exiting the chamber. This is to assure that the reason the test subject is not smelling the IAA is the good fit of the respirator facepiece seal and not olfactory fatigue.

(M) When the test subject leaves the chamber, the subject shall remove the saturated towel and return it to the person conducting the test. To keep the area from becoming contaminated, the used towels shall be kept in a self-sealing bag so there is no significant IAA concentration buildup in the test chamber during subsequent tests.

(N) At least two facepieces shall be selected for the IAA test protocol. The test subject shall be given the opportunity to wear them for one week to choose the one which is more comfortable to wear.

(O) Persons who have successfully passed this fit test with a half-mask respirator may be assigned the use of the test respirator in atmospheres with up to 2 f/cc of airborne asbestos.

(P) The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface.

(Q) If hair growth or apparel interfere with a satisfactory fit, then they shall be altered or removed so as to eliminate interference and allow a satisfactory fit. If a satisfactory fit is still not attained, the test subject must use a positive-pressure respirator such as powered air-purifying respirators, supplied-air respirator, or self-contained breathing apparatus.

(R) If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician trained in respirator diseases or pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his duties.

(S) Qualitative fit testing shall be repeated at least every six months.

(T) In addition, because the sealing of the respirator may be affected, qualitative fit testing shall be repeated immediately when the test subject has a:

- (I) Weight change of twenty pounds or more,
 - (II) Significant facial scarring in the area of the facepiece seal,
 - (III) Significant dental changes; i.e., multiple extractions without prosthesis, or acquiring dentures,
 - (IV) Reconstructive or cosmetic surgery, or
 - (V) Any other condition that may interfere with facepiece sealing.
- (iv) Recordkeeping.

A summary of all test results shall be maintained in each office for three years. The summary shall include:

- (A) Name of test subject.
 - (B) Date of testing.
 - (C) Name of the test conductor.
 - (D) Respirators selected (indicate manufacturer, model, size and approval number).
 - (E) Testing agent.
- (b) Saccharin solution aerosol protocol.
- (i) Respirator selection. Respirators shall be selected as described in (a)(ii) of this subsection (respirator selection), except that each respirator shall be equipped with a particulate filter.
 - (ii) Taste threshold screening.
 - (A) An enclosure about head and shoulders shall be used for threshold screening (to determine if the individual can taste saccharin) and for fit testing. The enclosure shall be approximately twelve inches in diameter by fourteen inches tall with at least the front clear to allow free movement of the head when a respirator is worn.
 - (B) The test enclosure shall have a three-quarter inch hole in front of the test subject's nose and mouth area to accommodate the nebulizer nozzle.
 - (C) The entire screening and testing procedure shall be explained to the test subject prior to conducting the screening test.
 - (D) During the threshold screening test, the test subject shall don the test enclosure and breathe with open mouth with tongue extended.
 - (E) Using a DeVilbiss Model 40 Inhalation Medication Nebulizer or equivalent, the test conductor shall spray the threshold check solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the fit test solution nebulizer.
 - (F) The threshold check solution consists of 0.83 grams of sodium saccharin, USP in water. It can be prepared by putting 1 cc of the test solution (see (b)(iii)(G) of this subsection) in one hundred cc of water.
 - (G) To produce the aerosol, the nebulizer bulb is firmly squeezed so that it collapses completely, then is released and allowed to fully expand.
 - (H) Ten squeezes of the nebulizer bulb are repeated rapidly and then the test subject is asked whether the saccharin can be tasted.
 - (I) If the first response is negative, ten more squeezes of the nebulizer bulb are repeated rapidly and the test subject is again asked whether the saccharin can be tasted.
 - (J) If the second response is negative, ten more squeezes are repeated rapidly and the test subject is again asked whether the saccharin can be tasted.
 - (K) The test conductor will take note of the number of squeezes required to elicit a taste response.
 - (L) If the saccharin is not tasted after thirty squeezes ((b)(ii)(J) of this subsection), the saccharin fit test cannot be performed on the test subject.
 - (M) If a taste response is elicited, the test subject shall be asked to take note of the taste for reference in the fit test.

(N) Correct use of the nebulizer means that approximately 1 cc of liquid is used at a time in the nebulizer body.

(O) The nebulizer shall be thoroughly rinsed in water, shaken dry, and refilled at least every four hours.

(iii) Fit test.

(A) The test subject shall don and adjust the respirator without the assistance from any person.

(B) The fit test uses the same enclosure described in (b)(ii) of this subsection.

(C) Each test subject shall wear the respirator for at least ten minutes before starting the fit test.

(D) The test subject shall don the enclosure while wearing the respirator selected in (a)(ii) of this subsection. This respirator shall be properly adjusted and equipped with a particulate filter.

(E) The test subject may not eat, drink, (except plain water), or chew gum for fifteen minutes before the test.

(F) A second DeVilbiss Model 40 Inhalation Medication Nebulizer is used to spray the fit test solution into the enclosure. This nebulizer shall be clearly marked to distinguish it from the screening test solution nebulizer.

(G) The fit test solution is prepared by adding eighty-three grams of sodium saccharin to one hundred cc of warm water.

(H) As before, the test subject shall breathe with mouth open and tongue extended.

(I) The nebulizer is inserted into the hole in the front of the enclosure and the fit test solution is sprayed into the enclosure using the same technique as for the taste threshold screening and the same number of squeezes required to elicit a taste response in the screening. (See (b)(ii)(H) through (J) of this subsection.)

(J) After generation of the aerosol read the following instructions to the test subject. The test subject shall perform the exercises for one minute each.

(I) Breathe normally.

(II) Breathe deeply. Be certain breaths are deep and regular.

(III) Turn head all the way from one side to the other. Be certain movement is complete. Inhale on each side. Do not bump the respirator against the shoulders.

(IV) Nod head up and down. Be certain motions are complete. Inhale when head is in the full up position (when looking toward the ceiling). Do not bump the respirator on the chest.

(V) Talking. Talk aloud and slowly for several minutes. The following paragraph is called the "rainbow passage." Reading it will result in a wide range of facial movements, and thus be useful to satisfy this requirement. Alternative passages which serve the same purpose may also be used.

(VI) Jogging in place.

(VII) Breathe normally.

"Rainbow Passage."

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at

one end. People look, but no one ever finds it. When a man looks for something beyond his reach, his friends say he is looking for the pot of gold at the end of the rainbow.

(K) At the beginning of each exercise, the aerosol concentration shall be replenished using one-half the number of squeezes as initially described in (b)(iii)(I) of this subsection.

(L) The test subject shall indicate to the test conductor if at any time during the fit test the taste of saccharin is detected.

(M) If the saccharin is detected the fit is deemed unsatisfactory and a different respirator shall be tried.

(N) At least two facepieces shall be selected by the saccharin test protocol. The test subject shall be given the opportunity to wear them for one week to choose the one which is more comfortable to wear.

(O) Successful completion of the test protocol shall allow the use of the half mask tested respirator in contaminated atmospheres up to 2 f/cc of asbestos. In other words this protocol may be used to assign protection factors no higher than ten.

(P) The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface.

(Q) If hair growth or apparel interfere with a satisfactory fit, then they shall be altered or removed so as to eliminate interference and allow a satisfactory fit. If a satisfactory fit is still not attained, the test subject must use a positive-pressure respirator such as powered air-purifying respirators, supplied-air respirator, or self-contained breathing apparatus.

(R) If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician trained in respirator diseases or pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his duties.

(S) Qualitative fit testing shall be repeated at least every six months.

(T) In addition, because the sealing of the respirator may be affected, qualitative fit testing shall be repeated immediately when the test subject has a:

(I) Weight change of twenty pounds or more,

(II) Significant facial scarring in the area of the facepiece seal,

(III) Significant dental changes; i.e., multiple extractions without prosthesis, or acquiring dentures,

(IV) Reconstructive or cosmetic surgery, or

(V) Any other condition that may interfere with facepiece sealing.

(iv) Recordkeeping.

A summary of all test results shall be maintained in each office for three years. The summary shall include:

(A) Name of test subject.

(B) Date of testing.

(C) Name of test conductor.

(D) Respirators selected (indicate manufacturer, model, size and approval number).

(E) Testing agent.

(c) Irritant fume protocol.

(i) Respirator selection.

Respirators shall be selected as described in (a)(ii) of this subsection, except that each respirator shall be equipped with a high-efficiency cartridge.

(ii) Fit test.

(A) The test subject shall be allowed to smell a weak concentration of the irritant smoke to familiarize the subject with the characteristic odor.

(B) The test subject shall properly don the respirator selected as above, and wear it for at least ten minutes before starting the fit test.

(C) The test conductor shall review this protocol with the test subject before testing.

(D) The test subject shall perform the conventional positive pressure and negative pressure fit checks (see ANSI Z88.2 1980). Failure of either check shall be cause to select an alternate respirator.

(E) Break both ends of a ventilation smoke tube containing stannic oxychloride, such as the MSA part #5645, or equivalent. Attach a short length of tubing to one end of the smoke tube. Attach the other end of the smoke tube to a low pressure air pump set to deliver two hundred milliliters per minute.

(F) Advise the test subject that the smoke can be irritating to the eyes and instruct the subject to keep the eyes closed while the test is performed.

(G) The test conductor shall direct the stream of irritant smoke from the tube towards the face area of the test subject. The person conducting the test shall begin with the tube at least twelve inches from the facepiece and gradually move to within one inch, moving around the whole perimeter of the mask.

(H) The test subject shall be instructed to do the following exercises while the respirator is being challenged by the smoke. Each exercise shall be performed for one minute.

(I) Breathe normally.

(II) Breathe deeply. Be certain breaths are deep and regular.

(III) Turn head all the way from one side to the other. Be certain movement is complete. Inhale on each side. Do not bump the respirator against the shoulders.

(IV) Nod head up and down. Be certain motions are complete and made every second. Inhale when head is in the full up position (looking toward ceiling). Do not bump the respirator against the chest.

(V) Talking. Talk aloud and slowly for several minutes. The following paragraph is called the "rainbow passage." Repeating it after the test conductor (keeping eyes closed) will result in a wide range of facial movements, and thus be useful to satisfy this requirement. Alternative passages which serve the same purpose may also be used.

"Rainbow Passage."

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colors. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond his reach, his friends

say he is looking for the pot of gold at the end of the rainbow.

(VI) Jogging in place.

(VII) Breathe normally.

(I) The test subject shall indicate to the test conductor if the irritant smoke is detected. If smoke is detected, the test conductor shall stop the test. In this case, the tested respirator is rejected and another respirator shall be selected.

(J) Each test subject passing the smoke test (i.e., without detecting the smoke) shall be given a sensitivity check of smoke from the same tube to determine if the test subject reacts to the smoke. Failure to evoke a response shall void the fit test.

(K) This fit test protocol, (c)(ii)(D), (I), and (J) of this subsection, shall be performed in a location with exhaust ventilation sufficient to prevent general contamination of the testing area by the test agents.

(L) At least two facepieces shall be selected by the irritant fume test protocol. The test subject shall be given the opportunity to wear them for one week to choose the one which is more comfortable to wear.

(M) Respirators successfully tested by the protocol may be used in contaminated atmospheres up to 2 f/cc of asbestos.

(N) The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface.

(O) If hair growth or apparel interfere with a satisfactory fit, then they shall be altered or removed so as to eliminate interference and allow a satisfactory fit. If a satisfactory fit is still not attained, the test subject must use a positive-pressure respirator such as powered air-purifying respirators, supplied-air respirator, or self-contained breathing apparatus.

(P) If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician trained in respirator diseases or pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his duties.

(Q) Qualitative fit testing shall be repeated at least every six months.

(R) In addition, because the sealing of the respirator may be affected, qualitative fit testing shall be repeated immediately when the test subject has a:

(I) Weight change of twenty pounds or more,

(II) Significant facial scarring in the area of the facepiece seal,

(III) Significant dental changes; i.e., multiple extractions without prosthesis, or acquiring dentures,

(IV) Reconstructive or cosmetic surgery, or

(V) Any other condition that may interfere with facepiece sealing.

(iii) Recordkeeping.

A summary of all test results shall be maintained in each office for three years. The summary shall include:

(A) Name of test subject.

(B) Date of testing.

(C) Name of test conductor.

(D) Respirators selected (indicate manufacturer, model, size and approval number).

(E) Testing agent.

(2) Quantitative fit test procedures.

(a) General.

(i) The method applies to the negative-pressure nonpowered air-purifying respirators only.

(ii) The employer shall assign one individual who shall assume the full responsibility for implementing the respirator quantitative fit test program.

(b) Definition.

(i) "Quantitative fit test" means the measurement of the effectiveness of a respirator seal in excluding the ambient atmosphere. The test is performed by dividing the measured concentration of challenge agent in a test chamber by the measured concentration of the challenge agent inside the respirator facepiece when the normal air-purifying element has been replaced by an essentially perfect purifying element.

(ii) "Challenge agent" means the air contaminant introduced into a test chamber so that its concentration inside and outside the respirator may be compared.

(iii) "Test subject" means the person wearing the respirator for quantitative fit testing.

(iv) "Normal standing position" means standing erect and straight with arms down along the sides and looking straight ahead.

(v) "Fit factor" means the ratio of challenge agent concentration outside with respect to the inside of a respirator inlet covering (facepiece or enclosure).

(c) Apparatus.

(i) Instrumentation. Corn oil, sodium chloride or other appropriate aerosol generation, dilution, and measurement systems shall be used for quantitative fit test.

(ii) Test chamber. The test chamber shall be large enough to permit all test subjects to freely perform all required exercises without distributing the challenge agent concentration or the measurement apparatus. The test chamber shall be equipped and constructed so that the challenge agent is effectively isolated from the ambient air yet uniform in concentration throughout the chamber.

(iii) When testing air-purifying respirators, the respirator shall be equipped with a cartridge or canister approved for removal of the test agent, or with a high efficiency particulate filter. Only approved assemblies shall be tested.

(iv) The sampling instrument shall be selected so that a strip chart record may be made of the test showing the rise and fall of challenge agent concentration with each inspiration and expiration at fit factors of at least two thousand.

(v) The combination of substitute air-purifying elements (if any), challenge agent, and challenge agent concentration in the test chamber shall be such that the test subject is not exposed in excess of PEL to the challenge agent at any time during the testing process.

(vi) The sampling port on the test specimen respirator shall be placed and constructed so that there is no detectable leak around the port, a free air flow is allowed into the sampling line at all times and so there is no interference with the fit or performance of the respirator.

(vii) The test chamber and test set-up shall permit the person administering the test to observe one test subject inside the chamber during the test.

(viii) The equipment generating the challenge atmosphere shall maintain the concentration of challenge agent constant within a ten percent variation for the duration of the test.

(ix) The time lag (interval between an event and its being recorded on the strip chart) of the instrumentation may not exceed two seconds.

(x) The tubing for the test chamber atmosphere and for the respirator sampling port shall be the same diameter, length and material. It shall be kept as short as possible. The smallest diameter tubing recommended by the manufacturer shall be used.

(xi) The exhaust flow from the test chamber shall pass through a high-efficiency filter before release to the room.

(xii) When sodium chloride aerosol is used, the relative humidity inside the test chamber shall not exceed fifty percent.

(d) Procedural requirements.

(i) The fitting of half-mask respirators should be started with those having multiple sizes and a variety of interchangeable cartridges and canisters such as the MSA Comfo II-M, North M, Survivair M, A-O M, or Scott-M. Use either of the tests outlined below to assure that the facepiece is properly adjusted.

(A) Positive pressure test. With the exhaust port(s) blocked, the negative pressure of slight inhalation should remain constant for several seconds.

(B) Negative pressure test. With the intake port(s) blocked, the negative pressure slight inhalation should remain constant for several seconds.

(ii) After a facepiece is adjusted, the test subject shall wear the facepiece for at least five minutes before conducting a qualitative test by using either of the methods described below and using the exercise regime described in (e)(i) through (v) of this subsection.

(A) Isoamyl acetate test. When using organic vapor cartridges, the test subject who can smell the odor should be unable to detect the odor of isoamyl acetate squirted into the air near the most vulnerable portions of the facepiece seal. In a location which is separated from the test area, the test subject shall be instructed to close her/his eyes during the test period. A combination cartridge or canister with organic vapor and high-efficiency filters shall be used when available for the particular mask being tested. The test subject shall be given an opportunity to smell the odor of isoamyl acetate before the test is conducted.

(B) Irritant fume test. When using high-efficiency filters, the test subject should be unable to detect the odor of irritant fume (stannic chloride or titanium tetrachloride ventilation smoke tubes) squirted into the air near the most vulnerable portions of the facepiece seal. The test subject shall be instructed to close her/his eyes during the test period.

(iii) The test subject may enter the quantitative testing chamber only if she or he has obtained a satisfactory fit as stated in (d)(ii) of this subsection.

(iv) Before the subject enters the test chamber, a reasonably stable challenge agent concentration shall be measured in the test chamber.

(v) Immediately after the subject enters the test chamber, the challenge agent concentration inside the respirator shall be measured to ensure that the peak penetration does not exceed five percent for a half-mask and one percent for a full facepiece.

(vi) A stable challenge agent concentration shall be obtained prior to the actual start of testing.

(A) Respirator restraining straps may not be overtightened for testing. The straps shall be adjusted by the wearer to give a reasonably comfortable fit typical of normal use.

(e) Exercise regime. Prior to entering the test chamber, the test subject shall be given complete instructions as to her/his part in the test procedures. The test subject shall perform the following exercises, in the order given, for each independent test.

(i) Normal breathing (NB). In the normal standing position, without talking, the subject shall breathe normally for at least one minute.

(ii) Deep breathing (DB). In the normal standing position the subject shall do deep breathing for at least one minute pausing so as not to hyperventilate.

(iii) Turning head side to side (SS). Standing in place the subject shall slowly turn his/her head from side between the extreme positions to each side. The head shall be held at each extreme position for at least five seconds. Perform for at least three complete cycles.

(iv) Moving head up and down (UD). Standing in place, the subject shall slowly move his/her head up and down between the extreme position straight up and the extreme position straight down. The head shall be held at each extreme position for at least five seconds. Perform for at least three complete cycles.

(v) Reading (R). The test subject (keeping eyes closed) shall repeat after the test conductor the "rainbow passage" at the end of this section. The subject shall talk slowly and aloud so as to be heard clearly by the test conductor or monitor. The test subject shall read the "rainbow passage" at the end of this section.

(vi) Grimace (G). The test subject shall grimace, smile, frown, and generally contort the face using the facial muscles. Continue for at least fifteen seconds.

(vii) Bend over and touch toes (B). The test subject shall bend at the waist and touch toes and return to upright position. Repeat for at least thirty seconds.

(viii) Jogging in place (J). The test subject shall perform jog in place for at least thirty seconds.

(ix) Normal breathing (NB). Same as exercise (e)(i) of this subsection.

"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.

(f) The test shall be terminated whenever any single peak penetration exceeds five percent for half-masks and one percent for full facepieces. The test subject may be refitted and retested. If two of the three required tests are terminated, the fit shall be deemed inadequate.

(g) Calculation of fit factors.

(i) The fit factor is determined by dividing the average challenge agent concentration in the test chamber by the average challenge agent concentration inside the respirator facepiece for the test exercise.

(ii) The average test chamber concentration is the arithmetic average of the test chamber concentration at the beginning and at the end of the test.

(iii) The average peak concentration of the challenge agent inside the respirator shall be the arithmetic average peak concentrations for each of the nine exercises of the test which are computed as the arithmetic average of the peak concentrations found for each breath during the exercise.

(iv) The average peak concentration for an exercise may be determined graphically if there is not a great variation in the peak concentrations during a single exercise.

(h) Interpretation of test results. The fit factor measured by the quantitative fit testing shall be the lowest of the three fit factors resulting from three independent tests.

(i) Other requirements.

(i) The test subject shall not be permitted to wear a half-mask or full facepiece mask if the minimum fit factor of one hundred or one thousand, respectively, cannot be obtained. If hair growth or apparel interfere with a satisfactory fit, then they shall be altered or removed so as to eliminate interference and allow a satisfactory fit. If a satisfactory fit is still not attained, the test subject must use a positive-pressure respirator such as powered air-purifying respirators, supplied-air respirator, or self-contained breathing apparatus.

(ii) The test shall not be conducted if there is any hair growth between the skin and the facepiece sealing surface.

(iii) If a test subject exhibits difficulty in breathing during the tests, she or he shall be referred to a physician trained in respirator diseases or pulmonary medicine to determine whether the test subject can wear a respirator while performing her or his duties.

(iv) The test subject shall be given the opportunity to wear the assigned respirator for one week. If the respirator does not provide a satisfactory fit during actual use, the test subject may request another QNFT which shall be performed immediately.

(v) A respirator fit factor card shall be issued to the test subject with the following information:

(A) Name.

(B) Date of fit test.

(C) Fit factor obtained for each manufacturer, model and approval number of respirator tested.

(D) Name and signature of the person that conducted the test.

(vi) Filters used for qualitative or quantitative fit testing shall be replaced weekly, whenever increased breathing resistance is encountered, or when the test agent has altered the integrity of the filter media. Organic vapor cartridges/canisters shall be replaced daily or sooner if there is any indication of breakthrough by the test agent.

(j) In addition, because the sealing of the respirator may be affected, quantitative fit testing shall be repeated immediately when the test subject has a:

- (i) Weight change of twenty pounds or more,
(ii) Significant facial scarring in the area of the face-piece seal,
(iii) Significant dental changes; i.e., multiple extractions without prosthesis, or acquiring dentures,
(iv) Reconstructive or cosmetic surgery, or
(v) Any other condition that may interfere with face-piece sealing.

(k) Recordkeeping.

A summary of all test results shall be maintained for three years. The summary shall include:

- (i) Name of test subject.
(ii) Date of testing.
(iii) Name of the test conductor.
(iv) Fit factors obtained from every respirator tested (indicate manufacturer, model, size and approval number).

[Statutory Authority: Chapter 49.17 WAC. 87-24-051 (Order 87-24), § 296-62-07739, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07739, filed 4/27/87.]

WAC 296-62-07741 Appendix D--Medical questionnaires--Mandatory. This mandatory appendix contains the medical questionnaires that must be administered to all employees who are exposed to asbestos above the action level, and who will therefore be included in their employer's medical surveillance program. Part 1 of the appendix contains the initial medical questionnaire, which must be obtained for all new hires who will be covered by the medical surveillance requirements. Part 2 includes the abbreviated periodical medical questionnaire, which must be administered to all employees who are provided periodic medical examinations under the medical surveillance provisions of the standard.

Part 1 INITIAL MEDICAL QUESTIONNAIRE

1. NAME
2. SOCIAL SECURITY #
3. CLOCK NUMBER
4. PRESENT OCCUPATION
5. PLANT
6. ADDRESS
7. (Zip Code)
8. TELEPHONE NUMBER
9. INTERVIEWER
10. DATE

11. Date of birth
12. Place of birth
13. Sex
14. What is your marital status?
15. Race
16. What is the highest grade completed in school?

OCCUPATIONAL HISTORY

17A. Have you ever worked full time
B. Have you ever worked for a year or more in any dusty job?
C. Have you ever been exposed to gas or chemical fumes in your work?
D. What has been your usual occupation or job--the one you have worked at the longest?

(Record on lines the years in which you have worked in any of these industries, e.g., 1960-1969.)

Have you ever worked:

E. In a mine?
F. In a quarry?
G. In a foundry?
H. In a pottery?
I. In a cotton, flax or hemp mill?
J. With asbestos?

18. PAST MEDICAL HISTORY

A. Do you consider yourself to be in good health?
B. Have you any defect in vision?
C. Have you any hearing defect?

D. Are you suffering from or have you ever suffered from:

a. Epilepsy (or fits, seizures, convulsions)?
b. Rheumatic fever?
c. Kidney disease?
d. Bladder disease?
e. Diabetes?
f. Jaundice?

19. CHEST COLDS AND CHEST ILLNESSES

19A. If you get a cold, does it usually go to your chest?
20A. During the past 3 years, have you had any chest illnesses that have kept you off work, indoors at home, or in bed?

IF YES TO 20A:

B. Did you produce phlegm with any of these chest illnesses?

C. In the last 3 years, how many such illnesses with (increased) phlegm did you have which lasted a week or more? Number of illnesses ___ No such illnesses ___

21. Did you have any lung trouble before the age of 16? 1. Yes ___ 2. No ___

22. Have you ever had any of the following? 1A. Attacks of bronchitis? 1. Yes ___ 2. No ___

IF YES TO 1A:

B. Was it confirmed by a doctor? 1. Yes ___ 2. No ___ 3. Does not apply ___

C. At what age was your first attack? Age in years ___ Does not apply ___

2A. Pneumonia? (include broncho-pneumonia) 1. Yes ___ 2. No ___

IF YES TO 2A:

B. Was it confirmed by a doctor? 1. Yes ___ 2. No ___ 3. Does not apply ___

C. At what age did you first have it? Age in years ___ Does not apply ___

3A. Hay fever? 1. Yes ___ 2. No ___

IF YES TO 3A:

B. Was it confirmed by a doctor? 1. Yes ___ 2. No ___ 3. Does not apply ___

C. At what age did it start? Age in years ___ Does not apply ___

23A. Have you ever had chronic bronchitis? 1. Yes ___ 2. No ___

IF YES TO 23A:

B. Do you still have it? 1. Yes ___ 2. No ___ 3. Does not apply ___

C. Was it confirmed by a doctor? 1. Yes ___ 2. No ___ 3. Does not apply ___

D. At what age did it start? Age in years ___ Does not apply ___

24A. Have you ever had emphysema? 1. Yes ___ 2. No ___

IF YES TO 24A:

B. Do you still have it? 1. Yes ___ 2. No ___ 3. Does not apply ___

C. Was it confirmed by a doctor? 1. Yes ___ 2. No ___ 3. Does not apply ___

D. At what age did it start? Age in years ___ Does not apply ___

25A. Have you ever had asthma? 1. Yes ___ 2. No ___

IF YES TO 25A:

B. Do you still have it? 1. Yes ___ 2. No ___ 3. Does not apply ___

C. Was it confirmed by a doctor? 1. Yes ___ 2. No ___ 3. Does not apply ___

D. At what age did it start? Age in years ___ Does not apply ___

E. If you no longer have it, at what age did it stop? Age stopped ___ Does not apply ___

26. Have you ever had:

A. Any other chest illness? 1. Yes ___ 2. No ___ If yes, please specify _____

B. Any chest operations? 1. Yes ___ 2. No ___ If yes, please specify _____

C. Any chest injuries? 1. Yes ___ 2. No ___ If yes, please specify _____

27A. Has a doctor ever told you that you had heart trouble? 1. Yes ___ 2. No ___

IF YES TO 27A:

B. Have you ever had treatment for heart trouble in the past 10 years? 1. Yes ___ 2. No ___ 3. Does not apply ___

28A. Has a doctor ever told you that you had high blood pressure? 1. Yes ___ 2. No ___

IF YES TO 28A:

B. Have you had any treatment for high blood pressure (hypertension) in the past 10 years? 1. Yes ___ 2. No ___ 3. Does not apply ___

29. When did you last have your chest x-rayed? (Year) 25 26 27 28

30. Where did you last have your chest x-rayed (if known)? What was the outcome? _____

FAMILY HISTORY

31. Were either of your natural parents ever told by a doctor that they had a chronic lung condition such as:

Table with columns for FATHER (1. Yes, 2. No, 3. Don't Know) and MOTHER (1. Yes, 2. No, 3. Don't Know)

A. Chronic Bronchitis? ___

B. Emphysema? ___

C. Asthma? ___

D. Lung cancer? ___

E. Other chest conditions? ___

F. Is parent currently alive? ___

G. Please specify ___ Age if living ___ Age if living ___ Age at death ___ Age at death ___ Don't know ___ Don't know

H. Please specify cause of death _____

COUGH

32A. Do you usually have a cough? (Count a cough with first smoke or on first going out of doors. Exclude clearing of throat.) (If no, skip to question 32C.) 1. Yes ___ 2. No ___

B. Do you usually cough as much as 4 to 6 times a day 4 or more days out of the week? 1. Yes ___ 2. No ___

C. Do you usually cough at all on getting up or first thing in the morning? 1. Yes ___ 2. No ___

D. Do you usually cough at all during the rest of the day or at night? 1. Yes ___ 2. No ___

IF YES TO ANY OF ABOVE (32A, B, C, OR D), ANSWER THE FOLLOWING. IF NO TO ALL, CHECK DOES NOT APPLY AND SKIP TO NEXT PAGE

E. Do you usually cough like this on most days for 3 consecutive months or more during the year? 1. Yes ___ 2. No ___ 3. Does not apply ___

F. For how many years have you had the cough? Number of years ___ Does not apply ___

33A. Do you usually bring up phlegm from your chest? (Count phlegm with the first smoke or on first going out of doors. Exclude phlegm from the nose. Count swallowed phlegm.) (If no, skip to 33C.) 1. Yes ___ 2. No ___

B. Do you usually bring up phlegm like this as much as twice a day 4 or more days out of the week? 1. Yes ___ 2. No ___

C. Do you usually bring up phlegm at all on getting up or first thing in the morning? 1. Yes ___ 2. No ___

D. Do you usually bring up phlegm at all during the rest of the day or at night? 1. Yes ___ 2. No ___

IF YES TO ANY OF THE ABOVE (33A, B, C, OR D), ANSWER THE FOLLOWING: IF NO TO ALL, CHECK DOES NOT APPLY AND SKIP TO 34A.

E. Do you bring up phlegm like this on most days for 3 consecutive months or more during the year? 1. Yes ___ 2. No ___ 3. Does not apply ___

F. For how many years have you had trouble with phlegm? Number of years ___ Does not apply ___

EPISODES OF COUGH AND PHEGEM

34A. Have you had periods or episodes of (increased*) cough and phlegm lasting for 3 weeks or more each year? 1. Yes ___ 2. No ___ *(For persons who usually have cough and/or phlegm.)

IF YES TO 34A:

B. For how long have you had at least 1 such episode per year? Number of years ___ Does not apply ___

WHEEZING

35A. Does your chest ever sound wheezy or whistling: 1. When you have a cold? 2. Occasionally apart from colds? 3. Most days or nights? 1. Yes ___ 2. No ___

IF YES TO 1, 2, OR 3 IN 35A:

B. For how many years has this been present? Number of years ___ Does not apply ___

36A. Have you ever had an attack of wheezing that has made you feel short of breath? 1. Yes ___ 2. No ___

IF YES TO 36A:

B. How old were you when you had your first such attack? Age in years ___ Does not apply ___

C. Have you had 2 or more such episodes? 1. Yes ___ 2. No ___ 3. Does not apply ___

D. Have you ever required medicine or treatment for the(se) attack(s)? 1. Yes ___ 2. No ___ 3. Does not apply ___

BREATHLESSNESS

37. If disabled from walking by any condition other than heart or lung disease, please describe and proceed to question 39A. Nature of condition(s) _____

38A. Are you troubled by shortness of breath when hurrying on the level or walking up a slight hill? 1. Yes ___ 2. No ___

IF YES TO 38A:

B. Do you have to walk slower than people of your age on the level because of breathlessness? 1. Yes ___ 2. No ___ 3. Does not apply ___

C. Do you ever have to stop for breath when walking at your own pace on the level? 1. Yes ___ 2. No ___ 3. Does not apply ___

D. Do you ever have to stop for breath after walking about 100 yards (or after a few minutes) on the level? 1. Yes ___ 2. No ___ 3. Does not apply ___

E. Are you too breathless to leave the house or breathless on dressing or climbing one flight of stairs? 1. Yes ___ 2. No ___ 3. Does not apply ___

TOBACCO SMOKING

39A. Have you ever smoked cigarettes? (No means less than 20 packs of cigarettes or 12 oz. of tobacco in a lifetime or less than 1 cigarette a day for 1 year.) 1. Yes ___ 2. No ___

IF YES TO 39A:

B. Do you now smoke cigarettes (as of one month ago)? 1. Yes ___ 2. No ___ 3. Does not apply ___

C. How old were you when you first started regular cigarette smoking? Age in years ___ Does not apply ___

D. If you have stopped smoking cigarettes completely, how old were you when you stopped? Aged stopped ___ Check if still smoking ___ Does not apply ___

E. How many cigarettes do you smoke per day now? Cigarettes per day ___ Does not apply ___

F. On the average of the entire time you smoked, how many cigarettes did you smoke per day? Cigarettes per day ___ Does not apply ___

G. Do you or did you inhale the cigarette smoke? 1. Does not apply ___ 2. Not at all ___ 3. Slightly ___ 4. Moderately ___ 5. Deeply ___

40A. Have you ever smoked a pipe regularly? (Yes means more than 12 ounces of tobacco in a lifetime.) 1. Yes ___ 2. No ___

IF YES TO 40A:

FOR PERSONS WHO HAVE EVER SMOKED A PIPE

B. 1. How old were you when you started to smoke a pipe regularly? Age ___

2. If you have stopped smoking a pipe completely, how old were you when you stopped? Age stopped ___ Check if still smoking pipe ___ Does not apply ___

C. On the average over the entire time you smoked a pipe, how much pipe tobacco did you smoke per week? ___ oz. per week (a standard pouch of tobacco contains 1-1/2 ounces) ___ Does not apply ___

D. How much pipe tobacco are you smoking now? oz. per week ___ Not currently smoking a pipe ___

E. Do you or did you inhale the pipe smoke? 1. Never smoked ___ 2. Not at all ___ 3. Slightly ___ 4. Moderately ___ 5. Deeply ___

41A. Have you ever smoked cigars regularly? (Yes means more than 1 cigar a week for a year.) 1. Yes ___ 2. No ___

IF YES TO 41A:

FOR PERSONS WHO HAVE EVER SMOKED CIGARS

B. 1. How old were you when you started smoking cigars regularly? Age ___

2. If you have stopped smoking cigars completely, how old were you when you stopped? Age stopped ___ Check if still smoking cigars ___ Does not apply ___

C. On the average over the entire time you smoked cigars, how many cigars did you smoke per week? Cigars per week ___ Does not apply ___

D. How many cigars are you smoking per week now? Cigars per week ___ Check if not smoking cigars currently ___

E. Do you or did you inhale the cigar smoke? 1. Never smoked ___ 2. Not at all ___ 3. Slightly ___ 4. Moderately ___ 5. Deeply ___

Signature _____ Date _____

Part 2 PERIODIC MEDICAL QUESTIONNAIRE

1. NAME _____

2. SOCIAL SECURITY # _____ 1 2 3 4 5 6 7 8 9

3. CLOCK NUMBER _____ 10 11 12 13 14 15

4. PRESENT OCCUPATION _____

5. PLANT _____

6. ADDRESS _____

7. _____
(Zip Code) _____

8. TELEPHONE NUMBER _____

9. INTERVIEWER _____

10. DATE _____ 16 17 18 19 20 21

11. What is your marital status? 1. Single ___ 4. Separated/
2. Married ___ Divorced ___
3. Widowed ___

12. OCCUPATIONAL HISTORY

12A. In the past year, did you work full time (30 hours per week or more) for 6 months or more? 1. Yes ___ 2. No ___

IF YES TO 12A:

12B. In the past year, did you work in a dusty job? 1. Yes ___ 2. No ___
3. Does not apply ___

12C. Was dust exposure: 1. Mild ___ 2. Moderate ___ 3. Severe ___

12D. In the past year, were you exposed to gas or chemical fumes in your work? 1. Yes ___ 2. No ___

12E. Was exposure: 1. Mild ___ 2. Moderate ___ 3. Severe ___

12F. In the past year, what was your: 1. Job/occupation? _____
2. Position/job title? _____

13. RECENT MEDICAL HISTORY

13A. Do you consider yourself to be in good health? Yes ___ No ___
If NO, state reason _____

13B. In the past year, have you developed:

Epilepsy?	Yes	No
Rheumatic fever?	___	___
Kidney disease?	___	___
Bladder disease?	___	___
Diabetes?	___	___
Jaundice?	___	___
Cancer?	___	___

14. CHEST COLDS AND CHEST ILLNESS

14A. If you get a cold, does it usually go to your chest? (Usually means more than 1/2 the time.) 1. Yes ___ 2. No ___
3. Don't get colds ___

15A. During the past year, have you had any chest illnesses that have kept you off work, indoors at home, or in bed? 1. Yes ___ 2. No ___
3. Does not apply ___

IF YES TO 15A:

15B. Did you produce phlegm with any of these chest illnesses? 1. Yes ___ 2. No ___
3. Does not apply ___

15C. In the past year, how many such illnesses with (increased) phlegm did you have which lasted a week or more? Number of illnesses ___
No such illnesses ___

16. RESPIRATORY SYSTEM

In the past year have you had:

Yes or No	Further Comment on Positive Answers
Asthma ___	
Bronchitis ___	
Hay fever ___	
Other allergies ___	

Yes or No	Further Comment on Positive Answers
Pneumonia ___	
Tuberculosis ___	
Chest surgery ___	
Other lung ___	
Problems ___	
Heart disease ___	

Do you have:

Yes or No	Further Comment on Positive Answers
Frequent colds ___	
Chronic cough ___	
Shortness of breath when walking or climbing one flight of stairs ___	
Do you: Wheeze ___	
Cough up phlegm ___	
Smoke cigarettes ___ Packs per day ___ How many years ___	

Date _____ Signature _____

[Statutory Authority: Chapter 49.17 WAC, 87-24-051 (Order 87-24), § 296-62-07741, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040, 87-10-008 (Order 87-06), § 296-62-07741, filed 4/27/87.]

WAC 296-62-07743 Appendix E--Interpretation and classification of chest roentgenograms--Mandatory.

(1) Chest roentgenograms shall be interpreted and classified in accordance with a professionally accepted classification system and recorded on an interpretation form following the format of the CDC/NIOSH (M) 2.8 form. As a minimum, the content within the bold lines of this form (items one through four) shall be included. This form is not to be submitted to NIOSH.

(2) Roentgenograms shall be interpreted and classified only by a B-reader, a board eligible/certified radiologist, or an experienced physician with known expertise in pneumoconioses.

(3) All interpreters, whenever interpreting chest roentgenograms made under this section, shall have immediately available for reference a complete set of the ILO-U/C International Classification of Radiographs for Pneumoconioses, 1980.

[Statutory Authority: Chapter 49.17 WAC, 87-24-051 (Order 87-24), § 296-62-07743, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040, 87-10-008 (Order 87-06), § 296-62-07743, filed 4/27/87.]

WAC 296-62-07745 Appendix F--Work practices and engineering controls for automotive brake repair operations--Nonmandatory.

This appendix is intended as guidance for employers in the automotive brake and clutch repair industry who wish to reduce their employees' asbestos exposures during repair operations to levels below the new standard's action level (0.1 f/cc). WISHA believes that employers in this industry sector are likely to be able to reduce their employees' exposures to asbestos by employing the engineering and work practice controls described in subsections (1) and (2) of this section. Those employers who choose to use these controls and who achieve exposures below the action level will thus be able to avoid any burden that might be

imposed by complying with such requirements as medical surveillance, recordkeeping, training, respiratory protection, and regulated areas, which are triggered when employee exposures exceed the action level or PEL.

Asbestos exposure in the automotive brake and clutch repair industry occurs primarily during the replacement of clutch plates and brake pads, shoes, and linings. Asbestos fibers may become airborne when an automotive mechanic removes the asbestos-containing residue that has been deposited as brakes and clutches wear. Employee exposures to asbestos occur during the cleaning of the brake drum or clutch housing.

WISHA believes that employers engaged in brake repair operations who implement any of the work practices and engineering controls described in subsections (1) and (2) of this section may be able to reduce their employees' exposures to levels below the action level (0.1 fiber/cc). These control methods and the relevant record evidence on these and other methods are described in the following sections.

(1) Enclosed cylinder/HEPA vacuum system method.

The enclosed cylinder-vacuum system used in one of the facilities visited by representatives of the National Institute for Occupational Safety and Health (NIOSH) during a health hazard evaluation of brake repair facilities consists of three components:

(a) A wheel-shaped cylinder designed to cover and enclose the wheel assembly;

(b) A compressed-air hose and nozzle that fits into a port in the cylinder; and

(c) A HEPA-filtered vacuum used to evacuate airborne dust generated within the cylinder by the compressed air.

To operate the system, the brake assembly is enclosed in a cylinder that has viewing ports to provide visibility and cotton sleeves through which the mechanic can handle the brake assembly parts. The cylinder effectively isolates asbestos dust in the drum from the mechanic's breathing zone. One company manufactures the brake assembly isolation cylinder. The cylinder is equipped with built-in compressed-air guns and a connection for a vacuum cleaner equipped with a high efficiency particulate air (HEPA) filter. This type of filter is capable of removing all particles greater than 0.3 microns from the air. When the vacuum cleaner's filter is full, it must be replaced according to the manufacturer's instruction, and appropriate HEPA-filtered dual cartridge respirators should be worn during the process. The filter of the vacuum cleaner is assumed to be contaminated with asbestos fibers and should be handled carefully, wetted with a fine mist of water, placed immediately in a labelled plastic bag, and disposed of properly. When the cylinder is in place around the brake assembly and the HEPA vacuum is connected, compressed air is blown into the cylinder to loosen the residue from the brake assembly parts. The vacuum then evacuates the loosened material from within the cylinder, capturing the airborne material on the HEPA filter.

The HEPA vacuum system can be disconnected from the brake assembly isolation cylinder when the cylinder is not being used. The HEPA vacuum can then be used

for clutch facing work, grinding, or other routine cleaning.

(2) Compressed air/solvent system method.

A compressed-air hose fitted at the end with a bottle of solvent can be used to loosen the asbestos-containing residue and to capture the resulting airborne particles in the solvent mist. The mechanic should begin spraying the asbestos-contaminated parts with the solvent at a sufficient distance to ensure that the asbestos particles are not dislodged by the velocity of the solvent spray. After the asbestos particles are thoroughly wetted, the spray may be brought closer to the parts and the parts may be sprayed as necessary to remove grease and other material. The automotive parts sprayed with the mist are then wiped with a rag, which must then be disposed of appropriately. Rags should be placed in a labelled plastic bag or other container while they are still wet. This ensures that the asbestos fibers will not become airborne after the brake and clutch parts have been cleaned. (If cleanup rags are laundered rather than disposed of, they must be washed using methods appropriate for the laundering of asbestos-contaminated materials.)

WISHA believes that a variant of this compressed-air/solvent mist process offers advantages over the compressed-air/solvent mist technique discussed above, both in terms of costs and employee protection. The variant involves the use of spray cans filled with any of several solvent cleaners commercially available from auto supply stores. Spray cans of solvent are inexpensive, readily available, and easy to use. These cans will also save time, because no solvent delivery system has to be assembled, i.e., no compressed-air hose/mister ensemble. OSHA believes that a spray can will deliver solvent to the parts to be cleaned with considerably less force than the alternative compressed-air delivery system described above, and will thus generate fewer airborne asbestos fibers than the compressed-air method. The agency therefore believes that the exposure levels of automotive repair mechanics using the spray can/solvent mist process will be even lower than the exposures reported by NIOSH for the compressed-air/solvent mist system (0.08 f/cc).

(3) Information on the effectiveness of various control measures.

The amount of airborne asbestos generated during brake and clutch repair operations depends on the work practices and engineering controls used during the repair or removal activity.

(a) Prohibited methods.

The use of compressed air to blow the asbestos-containing residue off the surface of the brake drum removes the residue effectively but simultaneously produces an airborne cloud of asbestos fibers. According to NIOSH, the peak exposures of mechanics using this technique were as high as fifteen fibers/cc, and eight-hour TWA exposures ranged from 0.03 to 0.19 f/cc.

Dr. William J. Nicholson of the Mount Sinai School of Medicine cited data from Knight and Hickish (1970) that indicated that the concentration of asbestos ranged from 0.84 to 5.35 f/cc over a sixty-minute sampling period when compressed air was being used to blow out the

asbestos-containing residue from the brake drum. In the same study, a peak concentration of eighty-seven f/cc was measured for a few seconds during brake cleaning performed with compressed air. Rohl et al. (1976) measured area concentrations (of unspecified duration) within three to five feet of operations involving the cleaning of brakes with compressed air and obtained readings ranging from 6.6 to 29.8 f/cc. Because of the high exposure levels that result from cleaning brake and clutch parts using compressed air, WISHA has prohibited this practice in the revised standard.

(b) Ineffective methods.

When dry brushing was used to remove the asbestos-containing residue from the brake drums and wheel assemblies, peak exposures measured by NIOSH ranged from 0.61 to 0.81 f/cc, while eight-hour TWA levels were at the new standard's permissible exposure limit (PEL) of 0.2 f/cc. Rohl and his colleagues collected area samples one to three feet from a brake cleaning operation being performed with a dry brush, and measured concentrations ranging from 1.3 to 3.6 f/cc; however, sampling times and TWA concentrations were not presented in the Rohl et al. study.

When a brush wetted with water, gasoline, or Stoddart solvent was used to clean the asbestos-containing residue from the affected parts, exposure levels (eight-hour TWAs) measured by NIOSH also exceeded the new 0.2 f/cc PEL, and peak exposures ranged as high as 2.62 f/cc.

(c) Preferred methods.

Use of an engineering control system involving a cylinder that completely encloses the brake shoe assembly and a high efficiency particulate air (HEPA) filter-equipped vacuum produced eight-hour TWA employee exposures of 0.01 f/cc and peak exposures ranging from nondetectable to 0.07 f/cc. (Because this system achieved exposure levels below the standard's action level, it is described in detail above.) Data collected by the Mount Sinai Medical Center for Nilfisk of America, Inc., the manufacturer of the brake assembly enclosure system, showed that for two of three operations sampled, the exposure of mechanics to airborne asbestos fibers was nondetectable. For the third operator sampled by Mt. Sinai researchers, the exposure was 0.5 f/cc, which the authors attributed to asbestos that had contaminated the operator's clothing in the course of previous brake repair operations performed without the enclosed cylinder/vacuum system.

Some automotive repair facilities use a compressed-air hose to apply a solvent mist to remove the asbestos-containing residue from the brake drums before repair. The NIOSH data indicated that mechanics employing this method experienced exposures (eight-hour TWAs) of 0.8 f/cc, with peaks of 0.25 to 0.68 f/cc. This technique, and a variant of it that OSHA believes is both less costly and more effective in reducing employee exposures, is described in greater detail in subsections (1) and (2) of this section.

(4) Summary.

In conclusion, WISHA believes that it is likely that employers in the brake and clutch repair industry will be

able to avail themselves of the action level trigger built into the revised standard if they conscientiously employ one of the three control methods described above: The enclosed cylinder/HEPA vacuum system, the compressed air/solvent method, or the spray can/solvent mist system.

[Statutory Authority: Chapter 49.17 WAC. 87-24-051 (Order 87-24), § 296-62-07745, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07745, filed 4/27/87.]

WAC 296-62-07747 Appendix G--Substance technical information for asbestos--Nonmandatory. (1) Substance identification.

(a) Substance: "Asbestos" is the name of a class of magnesium-silicate minerals that occur in fibrous form. Minerals that are included in this group are chrysotile, crocidolite, amosite, tremolite asbestos, anthophyllite asbestos, and actinolite asbestos.

(b) Asbestos is used in the manufacture of heat-resistant clothing, automotive brake and clutch linings, and a variety of building materials including floor tiles, roofing felts, ceiling tiles, asbestos-cement pipe and sheet, and fire-resistant drywall. Asbestos is also present in pipe and boiler insulation materials, and in sprayed-on materials located on beams, in crawlspaces, and between walls.

(c) The potential for a product containing asbestos, tremolite, anthophyllite, and actinolite to release breathable fibers depends on its degree of friability. Friable means that the material can be crumbled with hand pressure and is therefore likely to emit fibers. The fibrous or fluffy sprayed-on materials used for fireproofing, insulation, or sound proofing are considered to be friable, and they readily release airborne fibers if disturbed. Materials such as vinyl-asbestos floor tile or roofing felts are considered nonfriable and generally do not emit airborne fibers unless subjected to sanding or sawing operations. Asbestos-cement pipe or sheet can emit airborne fibers if the materials are cut or sawed, or if they are broken during demolition operations.

(d) Permissible exposure: Exposure to airborne asbestos fibers may not exceed 0.2 fibers per cubic centimeter of air (0.2 f/cc) averaged over the eight-hour workday.

(2) Health hazard data.

(a) Asbestos can cause disabling respiratory disease and various types of cancers if the fibers are inhaled. Inhaling or ingesting fibers from contaminated clothing or skin can also result in these diseases. The symptoms of these diseases generally do not appear for twenty or more years after initial exposure.

(b) Exposure to asbestos has been shown to cause lung cancer, mesothelioma, and cancer of the stomach and colon. Mesothelioma is a rare cancer of the thin membrane lining of the chest and abdomen. Symptoms of mesothelioma include shortness of breath, pain in the walls of the chest, and/or abdominal pain.

(3) Respirators and protective clothing.

(a) Respirators: You are required to wear a respirator when performing tasks that result in asbestos exposure that exceeds the permissible exposure limit (PEL) of 0.2

f/cc. These conditions can occur while your employer is in the process of installing engineering controls to reduce asbestos exposure, or where engineering controls are not feasible to reduce asbestos exposure. Air-purifying respirators equipped with a high-efficiency particulate air (HEPA) filter can be used where airborne asbestos fiber concentrations do not exceed 2 f/cc; otherwise, air-supplied, positive-pressure, full facepiece respirators must be used. Disposable respirators or dust masks are not permitted to be used for asbestos work. For effective protection, respirators must fit your face and head snugly. Your employer is required to conduct fit tests when you are first assigned a respirator and every six months thereafter. Respirators should not be loosened or removed in work situations where their use is required.

(b) Protective clothing: You are required to wear protective clothing in work areas where asbestos fiber concentrations exceed the permissible exposure limit (PEL) of 0.2 f/cc to prevent contamination of the skin. Where protective clothing is required, your employer must provide you with clean garments. Unless you are working on a large asbestos removal or demolition project, your employer must also provide a change room and separate lockers for your street clothes and contaminated work clothes. If you are working on a large asbestos removal or demolition project, and where it is feasible to do so, your employer must provide a clean room, shower, and decontamination room contiguous to the work area. When leaving the work area, you must remove contaminated clothing before proceeding to the shower. If the shower is not adjacent to the work area, you must vacuum your clothing before proceeding to the change room and shower. To prevent inhaling fibers in contaminated change rooms and showers, leave your respirator on until you leave the shower and enter the clean change room.

(4) Disposal procedures and cleanup.

(a) Wastes that are generated by processes where asbestos is present include:

(i) Empty asbestos shipping containers.

(ii) Process wastes such as cuttings, trimmings, or reject material.

(iii) Housekeeping waste from sweeping or vacuuming.

(iv) Asbestos fireproofing or insulating material that is removed from buildings.

(v) Building products that contain asbestos removed during building renovation or demolition.

(vi) Contaminated disposable protective clothing.

(b) Empty shipping bags can be flattened under exhaust hoods and packed into airtight containers for disposal. Empty shipping drums are difficult to clean and should be sealed.

(c) Vacuum bags or disposable paper filters should not be cleaned, but should be sprayed with a fine water mist and placed into a labeled waste container.

(d) Process waste and housekeeping waste should be wetted with water or a mixture of water and surfactant prior to packaging in disposable containers.

(e) Material containing asbestos that is removed from buildings must be disposed of in leaktight 6-mil thick

plastic bags, plastic-lined cardboard containers, or plastic-lined metal containers. These wastes, which are removed while wet, should be sealed in containers before they dry out to minimize the release of asbestos fibers during handling.

(5) Access to information.

(a) Each year, your employer is required to inform you of the information contained in this standard and appendices for asbestos. In addition, your employer must instruct you in the proper work practices for handling materials containing asbestos and the correct use of protective equipment.

(b) Your employer is required to determine whether you are being exposed to asbestos. You or your representative has the right to observe employee measurements and to record the results obtained. Your employer is required to inform you of your exposure, and, if you are exposed above the permissible limit, he or she is required to inform you of the actions that are being taken to reduce your exposure to within the permissible limit.

(c) Your employer is required to keep records of your exposures and medical examinations. These exposure records must be kept for at least thirty years. Medical records must be kept for the period of your employment plus thirty years.

(d) Your employer is required to release your exposure and medical records to your physician or designated representative upon your written request.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07747, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07747, filed 4/27/87.]

WAC 296-62-07749 Appendix H--Medical surveillance guidelines for asbestos--Nonmandatory. (1) Route of entry inhalation, ingestion.

(2) Toxicology.

Clinical evidence of the adverse effects associated with exposure to asbestos is present in the form of several well-conducted epidemiological studies of occupationally exposed workers, family contacts of workers, and persons living near asbestos mines. These studies have shown a definite association between exposure to asbestos and an increased incidence of lung cancer, pleural and peritoneal mesothelioma, gastrointestinal cancer, and asbestosis. The latter is a disabling fibrotic lung disease that is caused only by exposure to asbestos. Exposure to asbestos has also been associated with an increased incidence of esophageal, kidney, laryngeal, pharyngeal, and buccal cavity cancers. As with other known chronic occupational diseases, disease associated with asbestos generally appears about twenty years following the first occurrence of exposure: There are no known acute effects associated with exposure to asbestos.

Epidemiological studies indicate that the risk of lung cancer among exposed workers who smoke cigarettes is greatly increased over the risk of lung cancer among nonexposed smokers or exposed nonsmokers. These studies suggest that cessation of smoking will reduce the risk of lung cancer for a person exposed to asbestos but

will not reduce it to the same level of risk as that existing for an exposed worker who has never smoked.

(3) Signs and symptoms of exposure-related disease.

The signs and symptoms of lung cancer or gastrointestinal cancer induced by exposure to asbestos are not unique, except that a chest x-ray of an exposed patient with lung cancer may show pleural plaques, pleural calcification, or pleural fibrosis. Symptoms characteristic of mesothelioma include shortness of breath, pain in the walls of the chest, or abdominal pain. Mesothelioma has a much longer latency period compared with lung cancer (forty years versus fifteen to twenty years), and mesothelioma is therefore more likely to be found among workers who were first exposed to asbestos at an early age. Mesothelioma is always fatal.

Asbestosis is pulmonary fibrosis caused by the accumulation of asbestos fibers in the lungs. Symptoms include shortness of breath, coughing, fatigue, and vague feelings of sickness. When the fibrosis worsens, shortness of breath occurs even at rest. The diagnosis of asbestosis is based on a history of exposure to asbestos, the presence of characteristic radiologic changes, endinspiratory crackles (rales), and other clinical features of fibrosing lung disease. Pleural plaques and thickening are observed on x-rays taken during the early stages of the disease. Asbestosis is often a progressive disease even in the absence of continued exposure, although this appears to be a highly individualized characteristic. In severe cases, death may be caused by respiratory or cardiac failure.

(4) Surveillance and preventive considerations.

As noted above, exposure to asbestos has been linked to an increased risk of lung cancer, mesothelioma, gastrointestinal cancer, and asbestosis among occupationally exposed workers. Adequate screening tests to determine an employee's potential for developing serious chronic diseases, such as cancer, from exposure to asbestos do not presently exist. However, some tests, particularly chest x-rays and pulmonary function tests, may indicate that an employee has been overexposed to asbestos increasing his or her risk of developing exposure-related chronic diseases. It is important for the physician to become familiar with the operating conditions in which occupational exposure to asbestos is likely to occur. This is particularly important in evaluating medical and work histories and in conducting physical examinations. When an active employee has been identified as having been overexposed to asbestos measures taken by the employer to eliminate or mitigate further exposure should also lower the risk of serious long-term consequences.

The employer is required to institute a medical surveillance program for all employees who are or will be exposed to asbestos at or above the action level (0.1 fiber per cubic centimeter of air). All examinations and procedures must be performed by or under the supervision of a licensed physician, at a reasonable time and place, and at no cost to the employee.

Although broad latitude is given to the physician in prescribing specific tests to be included in the medical surveillance program, WISHA requires inclusion of the following elements in the routine examination:

(a) Medical and work histories with special emphasis directed to symptoms of the respiratory system, cardiovascular system, and digestive tract.

(b) Completion of the respiratory disease questionnaire contained in WAC 296-62-07741, Appendix D.

(c) A physical examination including a chest roentgenogram and pulmonary function test that includes measurement of the employee's forced vital capacity (FVC) and forced expiratory volume at one second (FEV₁).

(d) Any laboratory or other test that the examining physician deems by sound medical practice to be necessary.

The employer is required to make the prescribed tests available at least annually to those employees covered; more often than specified if recommended by the examining physician; and upon termination of employment.

The employer is required to provide the physician with the following information: A copy of this standard and appendices; a description of the employee's duties as they relate to asbestos exposure; the employee's representative level of exposure to asbestos; a description of any personal protective and respiratory equipment used; and information from previous medical examinations of the affected employee that is not otherwise available to the physician. Making this information available to the physician will aid in the evaluation of the employee's health in relation to assigned duties and fitness to wear personal protective equipment, if required.

The employer is required to obtain a written opinion from the examining physician containing the results of the medical examination; the physician's opinion as to whether the employee has any detected medical conditions that would place the employee at an increased risk of exposure-related disease; any recommended limitations on the employee or on the use of personal protective equipment; and a statement that the employee has been informed by the physician of the results of the medical examination and of any medical conditions related to asbestos exposure that require further explanation or treatment. This written opinion must not reveal specific findings or diagnoses unrelated to exposure to asbestos and a copy of the opinion must be provided to the affected employee.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07749, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-62-07749, filed 4/27/87.]

WAC 296-62-07751 Appendix I--Work practices and engineering controls for major asbestos removal, renovation, and demolition operations--Nonmandatory. This is a nonmandatory appendix designed to provide guidelines to assist employers in complying with the requirements of WAC 296-62-077 through 296-62-07753. Specifically, this appendix describes the equipment, methods, and procedures that should be used in major asbestos removal projects conducted to abate a recognized asbestos hazard or in preparation for building renovation or demolition. These projects require the construction of negative-pressure temporary enclosures

to contain the asbestos material and to prevent the exposure of bystanders and other employees at the work-site. WAC 296-62-07712 of the standard requires that " ----- Whenever feasible, the employer shall establish negative-pressure enclosures before commencing asbestos removal, demolition, or renovation operations." Employers should also be aware that, when conducting asbestos removal projects, they may be required under the National Emissions Standards for Hazardous Air Pollutants (NESHAPS), 40 CFR Part 61, Subpart M, or EPA regulations under the Clean Water Act.

(1) Introduction. Construction of a negative-pressure enclosure is a simple but time-consuming process that requires careful preparation and execution; however, if the procedures below are followed, contractors should be assured of achieving a temporary barricade that will protect employees and others outside the enclosure from exposure to asbestos and minimize to the extent possible the exposure of asbestos workers inside the barrier as well.

The equipment and materials required to construct these barriers are readily available and easily installed and used. In addition to an enclosure around the removal site, the standard requires employers to provide hygiene facilities that ensure that their asbestos contaminated employees do not leave the worksite with asbestos on their persons or clothing; the construction of these facilities is also described below. The steps in the process of preparing the asbestos removal site, building the enclosure, constructing hygiene facilities, removing the asbestos-containing material, and restoring the site include:

- (a) Planning the removal project;
- (b) Procuring the necessary materials and equipment;
- (c) Preparing the work area;
- (d) Removing the asbestos-containing material;
- (e) Cleaning the work area; and
- (f) Disposing of the asbestos-containing waste.

(2) Planning the removal project. The planning of an asbestos removal project is critical to completing the project safely and cost-effectively. A written asbestos removal plan should be prepared that describes the equipment and procedures that will be used throughout the project. The asbestos abatement plan will aid not only in executing the project but also in complying with the reporting requirements of the USEPA asbestos regulations (40 CFR 61, Subpart M), which call for specific information such as a description of control methods and control equipment to be used and the disposal sites the contractor proposes to use to dispose of the asbestos-containing materials.

The asbestos abatement plan should contain the following information:

- (a) A physical description of the work area;
- (b) A description of the approximate amount of material to be removed;
- (c) A schedule for turning off and sealing existing ventilation systems;
- (d) Personnel hygiene procedures;
- (e) Labeling procedures;

(f) A description of personal protective equipment and clothing to be worn by employees;

(g) A description of the local exhaust ventilation systems to be used;

(h) A description of work practices to be observed by employees;

(i) A description of the methods to be used to remove the asbestos-containing material;

(j) The wetting agent to be used;

(k) A description of the sealant to be used at the end of the project;

(l) An air monitoring plan;

(m) A description of the method to be used to transport waste material; and

(n) The location of the dump site.

(3) Materials and equipment necessary for asbestos removal. Although individual asbestos removal projects vary in terms of the equipment required to accomplish the removal of the material, some equipment and materials are common to most asbestos removal operations. Equipment and materials that should be available at the beginning of each project are: (a) Rolls of polyethylene sheeting; (b) rolls of gray duct tape or clear plastic tape; (c) HEPA-filtered vacuum(s); (d) HEPA-filtered portable ventilation system(s); (e) a wetting agent; (f) an airless sprayer; (g) a portable shower unit; (h) appropriate respirators; (i) disposable coveralls; (j) signs and labels; (k) preprinted disposal bags; and (l) a manometer or pressure gauge.

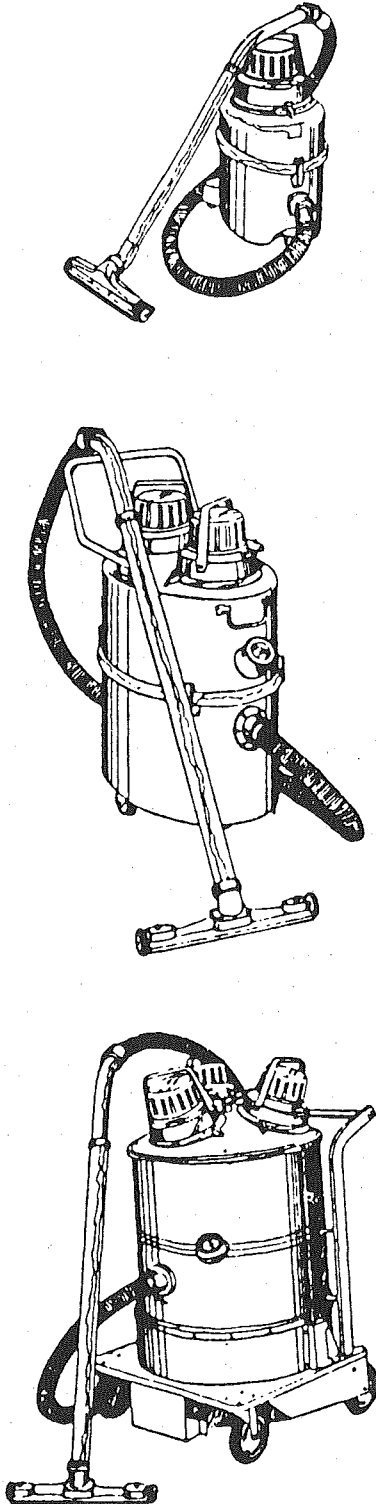
(a) and (b) Rolls of polyethylene plastic and tape. Rolls of polyethylene plastic (6 mil in thickness) should be available to construct the asbestos removal enclosure and to seal windows, doors, ventilation systems, wall penetrations, and ceilings and floors in the work area. Gray duct tape or clear plastic tape should be used to seal the edges of the plastic and to seal any holes in the plastic enclosure. Polyethylene plastic sheeting can be purchased in rolls up to twelve to twenty feet in width and up to one hundred feet in length.

(c) HEPA-filtered vacuum. A HEPA-filtered vacuum is essential for cleaning the work area after the asbestos has been removed. Such vacuums are designed to be used with a HEPA (high-efficiency particulate air) filter, which is capable of removing 99.97 percent of the asbestos particles from the air. Various sizes and capacities of HEPA vacuums are available. One manufacturer produces three models that range in capacity from five and one-quarter gallons to seventeen gallons (see Figure I-1). All of these models are portable, and all have long hoses capable of reaching out-of-the-way places, such as areas above ceiling tiles, behind pipes, etc.

(d) Exhaust air filtration system. A portable ventilation system is necessary to create a negative-pressure within the asbestos removal enclosure. Such units are equipped with a HEPA filter and are designed to exhaust and clean the air inside the enclosure before exhausting it to the outside of the enclosure (see Figure I-2). Systems are available from several manufacturers. One supplier has two ventilation units that range in capacity from six hundred cubic feet per minute (CFM) to one thousand seven hundred CFM. According to the

manufacturer's literature, these units filter particles of 0.3 micron in size with an efficiency of 99.99 percent. The number and capacity of units required to ventilate an enclosure depend on the size of the area to be ventilated.

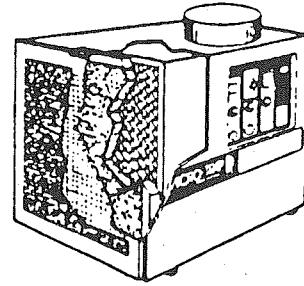
Figure I-1. HEPA-filtered vacuums



Source: Product Catalog, Asbestos Control Technologies, Inc., Maple Shade, N.J., 1985

[1988 WAC Supp—page 1828]

Figure I-2. Portable exhaust ventilation system with HEPA filter



Source: Product Catalog, Asbestos Control Technologies, Inc., Maple Shade, N.J., 1985

(e) Wetting agents. Wetting agents (surfactants) are added to water (which is then called amended water) and used to soak asbestos-containing materials; amended water penetrates more effectively than plain water and permits more thorough soaking of the asbestos-containing materials. Wetting the asbestos-containing material reduces the number of fibers that will break free and become airborne when the asbestos-containing material is handled or otherwise disturbed. Asbestos-containing materials should be thoroughly soaked before removal is attempted; the dislodged material should feel spongy to the touch. Wetting agents are generally prepared by mixing one to three ounces of wetting agent to five gallons of water.

One type of asbestos, amosite, is relatively resistant to soaking, either with plain or amended water. The work practices of choice when working with amosite-containing material are to soak the material as much as possible and then to bag it for disposal immediately after removal, so that the material has no time to dry and be ground into smaller particles that are more likely to liberate airborne asbestos.

In a very limited number of situations, it may not be possible to wet the asbestos-containing material before removing it. Examples of such rare situations are: (i) Removal of asbestos material from a "live" electrical box that was oversprayed with the material when the rest of the area was sprayed with asbestos-containing coating; and (ii) removing asbestos-containing insulation from a live steam pipe. In both of these situations, the preferred approach would be to turn off the electricity or steam, respectively, to permit wet removal methods to be used. However, where removal work must be performed during working hours, i.e., when normal operations cannot be disrupted, the asbestos-containing material must be removed dry. Immediate bagging is then the only method of minimizing the amount of airborne asbestos generated.

(f) Airless sprayer. Airless sprayers are used to apply amended water to asbestos-containing materials. Airless sprayers allow the amended water to be applied in a fine spray that minimizes the release of asbestos fibers by reducing the impact of the spray on the material to be

removed. Airless sprayers are inexpensive and readily available.

(g) Portable shower. Unless the site has available a permanent shower facility that is contiguous to the removal area, a portable shower system is necessary to permit employees to clean themselves after exposure to asbestos and to remove any asbestos contamination from their hair and bodies. Taking a shower prevents employees from leaving the work area with asbestos on their clothes and thus prevents the spread of asbestos contamination to areas outside the asbestos removal area. This measure also protects members of the families of asbestos workers from possible exposure to asbestos. Showers should be supplied with warm water and a drain. A shower water filtration system to filter asbestos fibers from the shower water is recommended. Portable shower units are readily available, inexpensive, and easy to install and transport.

(h) Respirators. Employees involved in asbestos removal projects should be provided with appropriate NIOSH-approved respirators. Selection of the appropriate respirator should be based on the concentration of asbestos fibers in the work area. If the concentration of asbestos fibers is unknown, employees should be provided with respirators that will provide protection against the highest concentration of asbestos fibers that can reasonably be expected to exist in the work area. For all work within an enclosure, employees should wear supplied air respirators (see WAC 296-62-07715(3)).

(i) Disposable coveralls. Employees involved in asbestos removal operations should be provided with disposable impervious coveralls that are equipped with head and foot covers. Such coveralls are typically made of Tyvek.¹ The coverall has a zipper front and elastic wrists and ankles.

(j) Signs and labels. Before work begins, a supply of signs to demarcate the entrance to the work area should be obtained. Signs are available that have the wording required by the final WISHA standard. The required labels are also commercially available as press-on labels and preprinted on the 6-mil polyethylene plastic bags used to dispose of asbestos-containing waste material.

(4) Preparing the work area. Preparation for constructing negative-pressure enclosures should begin with the removal of all movable objects from the work area, e.g., desks, chairs, rugs, and light fixtures, to ensure that these objects do not become contaminated with asbestos. When objects or surfaces are contaminated or are suspected of being contaminated, they should be vacuumed with a HEPA vacuum and cleaned with amended water, unless they are made of material that will be damaged by the wetting agent; wiping with plain water is recommended in those cases where amended water will damage the object. Before the asbestos removal work begins, objects that cannot be removed from the work area should be covered with a 6-mil-thick polyethylene plastic sheeting that is securely taped with duct tape or plastic tape to achieve an air-tight seal around the object.

(5) Constructing the enclosure. When all objects have either been removed from the work area or covered with

plastic, all penetrations of the floor, walls, and ceiling should be sealed with 6-mil polyethylene plastic and tape to prevent airborne asbestos from escaping into areas outside the work area or from lodging in cracks around the penetrations. Penetrations that require sealing are typically found around electrical conduits, telephone wires, and water supply and drain pipes. A single entrance to be used for access and egress to the work area should be selected, and all other doors and windows should be sealed with tape or be covered with 6-mil polyethylene plastic sheeting and securely taped. Covering windows and unnecessary doors with a layer of polyethylene before covering the walls provides a second layer of protection and saves time in installation because it reduces the number of edges that must be cut and taped. All other surfaces such as support columns, ledges, pipes, and other surfaces should also be covered with polyethylene plastic sheeting and taped before the walls themselves are completely covered with sheeting.

Next a thin layer of spray adhesive should be sprayed along the top of all walls surrounding the enclosed work area, close to the wall-ceiling interface, and a layer of polyethylene plastic sheeting should be stuck to this adhesive and taped. The entire inside surfaces of all wall areas are covered in this manner, and the sheeting over the walls is extended across the floor area until it meets in the center of the area, where it is taped to form a single layer of material encasing the entire room except for the ceiling. A final layer of plastic sheeting is then laid across the plastic-covered floor area and up the walls to a level of two feet or so; this layer provides a second protective layer of plastic sheeting over the floor, which can then be removed and disposed of easily after the asbestos-containing material that has dropped to the floor has been bagged and removed.

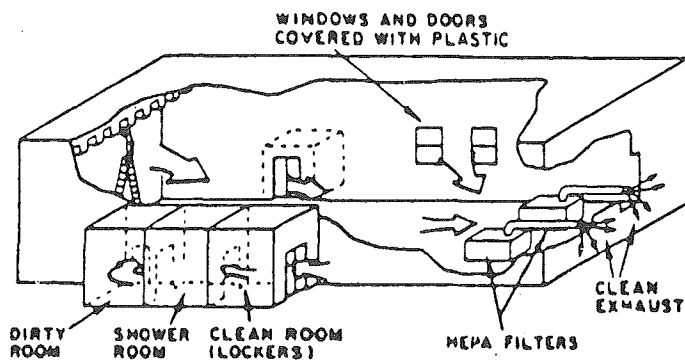
(6) Building hygiene facilities. WAC 296-62-07719 mandates that employers involved in asbestos removal, demolition, or renovation operations provide their employees with hygiene facilities to be used to decontaminate asbestos-exposed workers, equipment, and clothing before such employees leave the work area. These decontamination facilities consist of:

- (a) A clean change room;
- (b) A shower; and
- (c) An equipment room.

The clean change room is an area in which employees remove their street clothes and don their respirators and disposable protective clothing. The clean room should have hooks on the wall or be equipped with lockers for the storage of workers' clothing and personal articles. Extra disposable coveralls and towels can also be stored in the clean change room.

The shower should be contiguous with both the clean and dirty change room (see Figure I-3) and should be used by all workers leaving the work area. The shower should also be used to clean asbestos-contaminated equipment and materials, such as the outsides of asbestos waste bags and hand tools used in the removal process.

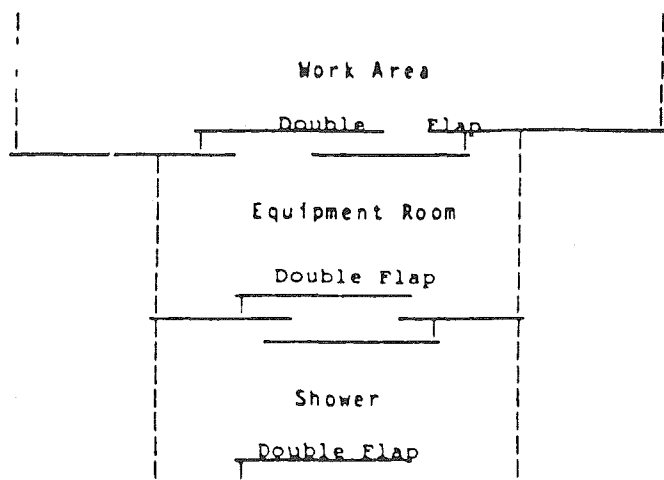
Figure I-3. Cutaway view of enclosure and hygiene facilities



Source: EPA 1985. Asbestos Waste Management Guidance (EPA/530 SW-85-007)

The equipment room (also called the dirty change room) is the area where workers remove their protective coveralls and where equipment that is to be used in the work area can be stored. The equipment room should be lined with 6-mil-thick polyethylene plastic sheeting in the same way as was done in the work area enclosure. Two layers of 6-mil polyethylene plastic sheeting that are not taped together from a double flap or barrier between the equipment room and the work area and between the shower and the clean change room (see Figure I-4).

Figure I-4. Typical hygiene facility layout



When feasible, the clean change room, shower, and equipment room should be contiguous and adjacent to the negative-pressure enclosure surrounding the removal area. In the overwhelming number of cases, hygiene facilities can be built contiguous to the negative-pressure enclosure. In some cases, however, hygiene facilities may have to be located on another floor of the building where

removal of asbestos-containing materials is taking place. In these instances, the hygiene facilities can in effect be made to be contiguous to the work area by constructing a polyethylene plastic "tunnel" from the work area to the hygiene facilities. Such a tunnel can be made even in cases where the hygiene facilities are located several floors above or below the work area; the tunnel begins with a double flap door at the enclosure, extends through the exit from the floor, continues down the necessary number of flights of stairs and goes through a double flap entrance to the hygiene facilities, which have been prepared as described above. The tunnel is constructed of two-inch by four-inch lumber or aluminum struts and covered with 6-mil-thick polyethylene plastic sheeting.

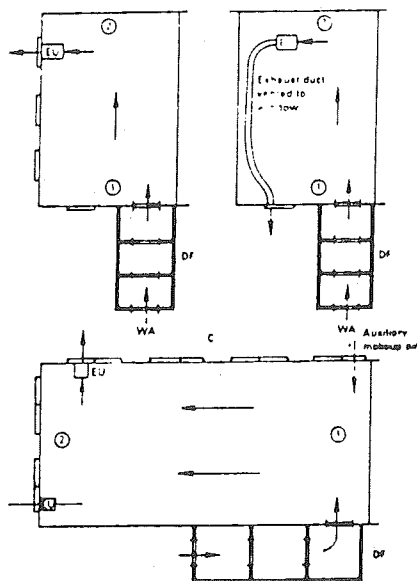
In the rare instances when there is not enough space to permit any hygiene facilities to be built at the work-site, employees should be directed to change into a clean disposable worksuit immediately after exiting the enclosure (without removing their respirators) and to proceed immediately to the shower. Alternatively, employees could be directed to vacuum their disposable coveralls with a HEPA-filtered vacuum before proceeding to a shower located a distance from the enclosure.

The clean room, shower, and equipment room must be sealed completely to ensure that the sole source of air flow through these areas originates from uncontaminated areas outside the asbestos removal, demolition, or renovation enclosure. The shower must be drained properly after each use to ensure that contaminated water is not released to uncontaminated areas. If waste water is inadvertently released, it should be cleaned up as soon as possible to prevent any asbestos in the water from drying and becoming airborne in areas outside the work area.

(7) Establishing negative-pressure within the enclosure. After construction of the enclosure is completed, a ventilation system(s) should be installed to create a negative-pressure within the enclosure with respect to the area outside the enclosure. Such ventilation systems must be equipped with HEPA filters to prevent the release of asbestos fibers to the environment outside the enclosure and should be operated twenty-four hours per day during the entire project until the final cleanup is completed and the results of final air samples are received from the laboratory. A sufficient amount of air should be exhausted to create a pressure of -0.02 inches of water within the enclosure with respect to the area outside the enclosure.

These ventilation systems should exhaust the HEPA-filtered clean air outside the building in which the asbestos removal, demolition, or renovation is taking place (see Figure I-5). If access to the outside is not available, the ventilation system can exhaust the HEPA-filtered asbestos-free air to an area within the building that is as far away as possible from the enclosure. Care should be taken to ensure that the clean air is released either to an asbestos-free area or in such a way as not to disturb any asbestos-containing materials.

Figure I-5. Examples of negative-pressure systems. DF, decontamination facility; EU, exhaust unit; WA, worker access; A, single-room work area with multiple windows; B, single-room work area with single window near entrance; C, large single-room work area with windows and auxiliary makeup air source (dotted arrow). Arrows denote direction of air flow. Circled numbers indicate progression of removal sequence.



Source: EPA 1985. Guidance for Controlling Asbestos-Containing Materials in Buildings (EPA 560/5-85-024)

A manometer or pressure gauge for measuring the negative pressure within the enclosure should be installed and should be monitored frequently throughout all work shifts during which asbestos removal, demolition, or renovation takes place. Several types of manometers and pressure gauges are available for this purpose.

All asbestos removal, renovation, and demolition operations should have a program for monitoring the concentration of airborne asbestos and employee exposures to asbestos. Area samples should be collected inside the enclosure (approximately four samples for five thousand square feet of enclosure area). At least two samples should be collected outside the work area, one at the entrance to the clean change room and one at the exhaust of the portable ventilation system. In addition, several breathing zone samples should be collected from those workers who can reasonably be expected to have the highest potential exposure to asbestos.

(8) Removing asbestos materials. Employers involved in asbestos removal, demolition, or renovation operations designate a competent person to:

- (a) Set up the enclosure;
- (b) Ensure the integrity of the enclosure;
- (c) Control entry to and exit from the enclosure;
- (d) Supervise all employee exposure monitoring required by this section;

(e) Ensure the use of protective clothing and equipment;

(f) Ensure that employees are trained in the use of engineering controls, work practices, and personal protective equipment;

(g) Ensure the use of hygiene facilities and the observance of proper decontamination procedures; and

(h) Ensure that engineering controls are functioning properly.

The competent person will generally be a certified industrial hygienist, an industrial hygienist with training and experience in the handling of asbestos, or a person who has such training and experience as a result of on-the-job training and experience.

Ensuring the integrity of the enclosure is accomplished by inspecting the enclosure before asbestos removal work begins and prior to each work shift throughout the entire period work is being conducted in the enclosure. The inspection should be conducted by locating all areas where air might escape from the enclosure; this is best accomplished by running a hand over all seams in the plastic enclosure to ensure that no seams are ripped and the tape is securely in place.

The competent person should also ensure that all unauthorized personnel do not enter the enclosure and that all employees and other personnel who enter the enclosure have the proper protective clothing and equipment. He or she should also ensure that all employees and other personnel who enter the enclosure use the hygiene facilities and observe the proper decontamination procedures (described below).

Proper work practices are necessary during asbestos removal, demolition, and renovation to ensure that the concentration of asbestos fibers inside the enclosure remains as low as possible. One of the most important work practices is to wet the asbestos-containing material before it is disturbed. After the asbestos-containing material is thoroughly wetted, it should be removed by scraping (as in the case of sprayed-on or troweled-on ceiling material) or removed by cutting the metal bands or wire mesh that support the asbestos-containing material on boilers or pipes. Any residue that remains on the surface of the object from which asbestos is being removed should be wire brushed and wet wiped.

Bagging asbestos waste material promptly after its removal is another work practice control that is effective in reducing the airborne concentration of asbestos within the enclosure. Whenever possible, the asbestos should be removed and placed directly into bags for disposal rather than dropping the material to the floor and picking up all of the material when the removal is complete. If a significant amount of time elapses between the time that the material is removed and the time it is bagged, the asbestos material is likely to dry out and generate asbestos-laden dust when it is disturbed by people working within the enclosure. Any asbestos-contaminated supplies and equipment that cannot be decontaminated should be disposed of in pre-labeled bags; items in this category include plastic sheeting, disposable work clothing, respirator cartridges, and contaminated wash water.

A checklist is one of the most effective methods of ensuring adequate surveillance of the integrity of the asbestos removal enclosure. Such a checklist is shown in Figure I-6. Filling out the checklist at the beginning of each shift in which asbestos removal is being performed will serve to document that all the necessary precautions will be taken during the asbestos removal work. The checklist contains entries for ensuring that:

- The work area enclosure is complete;
- The negative-pressure system is in operation;
- Necessary signs and labels are used;

Asbestos Removal, Renovation, and Demolition Checklist

Date _____ Location _____
 Supervisor, _____ Project # _____
 Work Area (sq. ft.) _____

	Yes	No
I. Work site barrier		
Floor covered	___	___
Walls covered	___	___
Area ventilation off	___	___
All edges sealed	___	___
Penetrations sealed	___	___
Entry curtains	___	___
II. Negative air pressure		
HEPA Vac _____ Ventilation system _____		
Constant operation	___	___
Negative pressure achieved	___	___
III. Signs		
Work area entrance	___	___
Bags labeled	___	___
IV. Work practices		
Removed material promptly bagged	___	___
Material worked wet	___	___
HEPA vacuum used	___	___
No smoking	___	___
No eating, drinking	___	___
Work area cleaned after completion	___	___
Personnel decontaminated each departure	___	___
V. Protective equipment		
Disposable clothing used one time	___	___
Proper NIOSH-approved respirators	___	___
VII. Showers		
On site	___	___
Functioning	___	___
Soap and towels	___	___
Used by all personnel	___	___

Figure I-6. Checklist

Appropriate work practices are used;
 Necessary protective clothing and equipment are used;
 and
 Appropriate decontamination procedures are being followed.

(9) Cleaning the work area. After all of the asbestos-containing material is removed and bagged, the entire work area should be cleaned until it is free of all visible asbestos dust. All surfaces from which asbestos has been removed should be cleaned by wire brushing the surfaces, HEPA vacuuming these surfaces, and wiping them with amended water. The inside of the plastic enclosure should be vacuumed with a HEPA vacuum and wet wiped until there is no visible dust in the enclosure.

Particular attention should be given to small horizontal surfaces such as pipes, electrical conduits, lights, and support tracks for drop ceilings. All such surfaces should be free of visible dust before the final air samples are collected.

Additional sampling should be conducted inside the enclosure after the cleanup of the work area has been completed. Approximately four area samples should be collected for each five thousand square feet of enclosure area. The enclosure should not be dismantled unless the final samples show asbestos concentrations of less than the action level.

A clearance checklist is an effective method of ensuring that all surfaces are adequately cleaned and the enclosure is ready to be dismantled. Figure I-7 shows a checklist that can be used during the final inspection phase of asbestos abatement, removal, or renovation operations.

Final Inspection of Asbestos Removal, Renovation, and Demolition Projects

Date: _____
 Project: _____
 Location: _____
 Building: _____

CHECKLIST:

	Yes	No		Yes	No
Residual dust on:					
a. Floor	___	___	e. Horizontal surfaces	___	___
b. Horizontal surfaces	___	___	f. Pipes	___	___
c. Pipes	___	___	g. Ducts	___	___
d. Ventilation equipment	___	___	h. Register	___	___
			i. Lights	___	___

FIELD NOTES:

Record any problems encountered here.

FINAL AIR SAMPLE RESULTS: _____

Figure I-7. Clearance Checklist

¹ Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07751, filed 11/30/87.]

WAC 296-62-07753 Appendix J--Work practices and engineering controls for small-scale, short-duration asbestos renovation and maintenance operations--Non-mandatory. This appendix is not mandatory, in that employers may choose to comply with all of the requirements of WISHA's standard for occupational exposure to asbestos during construction activities, WAC 296-62-077 through 296-62-07753. However, employers wishing to be exempted from the requirements of WAC 296-62-07712 shall comply with the provisions of this appendix when performing small-scale, short-duration renovation or maintenance operations. WISHA anticipates that employers in the electrical, carpentry, utility, plumbing, and interior construction trades may

wish to avail themselves of the final standard's exemptions for small-scale, short-duration renovation and maintenance operations.

(1) Definition of small-scale, short-duration operations. For the purposes of this appendix, small-scale, short-duration renovation and maintenance activities are tasks involving less than ten linear feet and less than eleven square feet of material. This means a total of eleven square feet of material whether on flat surfaces or not and includes pipes. Regardless of pipe diameter, runs cannot exceed ten linear feet. The tasks include but are not limited to:

- Removal of asbestos-containing insulation on pipes;

- Removal of small quantities of asbestos-containing insulation on beams or above ceilings;

- Replacement of an asbestos-containing gasket on a valve;

- Installation or removal of a small section of drywall;

- Installation of electrical conduits through or proximate to asbestos-containing materials.

Evidence in the record suggests that the use of certain engineering and work practice controls is capable of reducing employee exposures to asbestos to levels below the action level (0.1 f/cc). Several controls and work practices, used either singly or in combination, can be employed effectively to reduce asbestos exposures during small maintenance and renovation operations. These include:

- Wet methods;

- Removal methods;

- Use of glove bags;

- Removal of entire asbestos insulated pipes or structures;

- Use of mini-enclosures;

- Enclosure of asbestos materials; and

- Maintenance programs.

This appendix describes these controls and work practices in detail.

(2) Preparation of the area before renovation or maintenance activities. The first step in preparing to perform a small-scale, short-duration asbestos renovation or maintenance task, regardless of the abatement method that will be used, is the removal from the work area of all objects that are movable to protect them from asbestos contamination. Objects that cannot be removed must be covered completely with a 6-mil-thick polyethylene plastic sheeting before the task begins. If objects have already been contaminated, they should be thoroughly cleaned with a high-efficiency particulate air (HEPA) filtered vacuum or be wet wiped before they are removed from the work area or completely encased in the plastic.

(3) Wet methods. Whenever feasible, and regardless of the abatement method to be used (e.g., removal, enclosure, use of glove bags), wet methods must be used

during small-scale, short-duration maintenance and renovation activities that involve disturbing asbestos-containing materials. Handling asbestos materials wet is one of the most reliable methods of ensuring that asbestos fibers do not become airborne, and this practice should therefore be used whenever feasible. Wet methods can be used in the great majority of workplace situations. Only in cases where asbestos work must be performed on live electrical equipment, on live steam lines, or in other areas where water will seriously damage materials or equipment may dry removal be performed. Amended water or another wetting agent should be applied by means of an airless sprayer to minimize the extent to which the asbestos-containing material is disturbed.

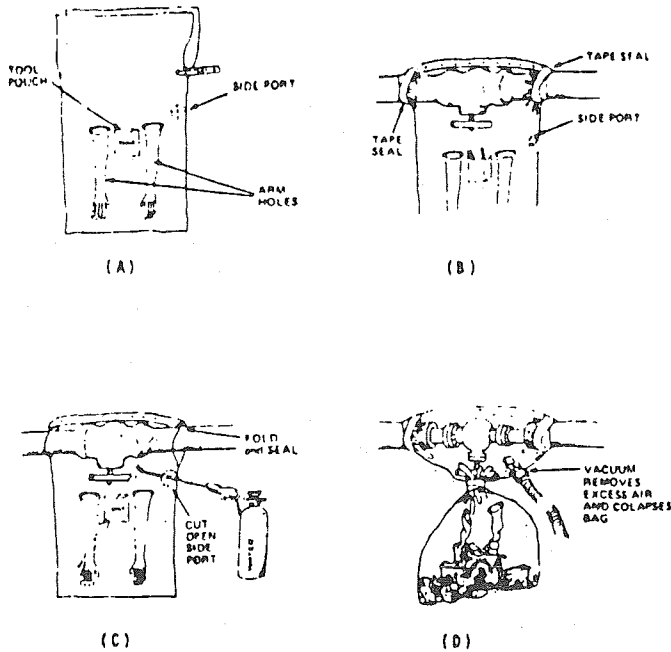
Asbestos-containing materials should be wetted from the initiation of the maintenance or renovation operation and wetting agents should be used continually throughout the work period to ensure that any dry asbestos-containing material exposed in the course of the work is wet and remains wet until final disposal.

(4) Removal of small amount of asbestos-containing materials. Several methods can be used to remove small amounts of asbestos-containing materials during small-scale, short-duration renovation or maintenance tasks. These include the use of glove bags, the removal of an entire asbestos-covered pipe or structure, and the construction of mini-enclosures. The procedures that employers must use for each of these operations if they wish to avail themselves of the final rule's exemptions are described in the following subsections.

(5) Glove bags. The use of glove bags to enclose the work area during small-scale, short-duration maintenance or renovation activities will result in employee exposures to asbestos that are below the action level of 0.1 f/cc. This appendix provides requirements for glove bag procedures to be followed by employers wishing to avail themselves of the standard's exemptions for each activities. WISHA has determined that the use of these procedures will reduce the eight-hour time-weighted average (TWA) exposures of employees involved in these work operations to levels below the action level and will thus provide a degree of employee protection equivalent to that provided by compliance with all provisions of the final rule.

(a) Glove bag installation. Glove bags are approximately forty-inch-wide times sixty-four-inch-long bags fitted with arms through which the work can be performed (see Figure J-1(A)). When properly installed and used, they permit workers to remain completely isolated from the asbestos material removed or replaced inside the bag. Glove bags can thus provide a flexible, easily installed, and quickly dismantled temporary small work area enclosure that is ideal for small-scale asbestos renovation or maintenance jobs.

Figure J-1. Diagrams showing proper use of glove bags in small-scale, short-duration maintenance and renovation operations



These bags are single use control devices that are disposed of at the end of each job. The bags are made of transparent 6-mil-thick polyethylene plastic with arms made of material such as Tyvek* (the same material used to make the disposable protective suits used in major asbestos removal, renovation, and demolition operations and in protective gloves). Glove bags are readily available from safety supply stores or specialty asbestos removal supply houses. Glove bags come pre-labeled with the asbestos warning label prescribed by WISHA and EPA for bags used to dispose of asbestos waste.

(b) Glove bag equipment and supplies. Supplies and materials that are necessary to use glove bags effectively include:

- (i) Tape to seal the glove bag to the area from which asbestos is to be removed;
- (ii) Amended water or other wetting agents;
- (iii) An airless sprayer for the application of the wetting agent;
- (iv) Bridging encapsulant (a paste-like substance for coating asbestos) to seal the rough edges of any asbestos-containing materials that remain within the glove bag at the points of attachment after the rest of the asbestos has been removed;
- (v) Tools such as razor knives, nips, and wire brushes (or other tools suitable for cutting wire, etc.);
- (vi) A HEPA filter-equipped vacuum for evacuating the glove bag (to minimize the release of asbestos fibers) during removal of the bag from the work area and for cleaning any material that may have escaped during the installation of the glove bag; and
- (vii) HEPA-equipped cartridge respirators for use by the employees involved in the removal of asbestos with the glove bag.

(c) Glove bag work practices. The proper use of glove bags requires the following steps:

(i) Glove bags must be installed so that they completely cover the pipe or other structure where asbestos work is to be done. Glove bags are installed by cutting the sides of the glove bag to fit the size of the pipe from which asbestos is to be removed. The glove bag is attached to the pipe by folding the open edges together and securely sealing them with tape. All openings in the glove bag must be sealed with duct tape or equivalent material. The bottom seam of the glove bag must also be sealed with duct tape or equivalent to prevent any leakage from the bag that may result from a defect in the bottom seam (Figure J-1(B)).

(ii) The employee who is performing the asbestos removal with the glove bag must don a half-mask dual-cartridge HEPA-equipped respirator; respirators and protective clothing should be worn by employees who are in close contact with the glove bag and who may thus be exposed as a result of small gaps in the seams of the bag or holes punched through the bag by a razor knife or a piece of wire mesh.

(iii) The removed asbestos material from the pipe or other surface that has fallen into the enclosed bag must be thoroughly wetted with a wetting agent (applied with an airless sprayer through the pre-cut port provided in most glove bags or applied through a small hole cut in the bag) (Figure J-1(C)).

(iv) Once the asbestos material has been thoroughly wetted, it can be removed from the pipe, beam or other surface. The choice of tool to use to remove the asbestos-containing material depends on the type of material to be removed. Asbestos-containing materials are generally covered with painted canvas and/or wire mesh. Painted canvas can be cut with a razor knife and peeled away from the asbestos-containing material underneath. Once the canvas has been peeled away, the asbestos-containing material underneath may be dry, in which case it should be resprayed with a wetting agent to ensure that it generates as little dust as possible when removed. If the asbestos-containing material is covered with wire mesh, the mesh should be cut with nips, tin snips, or other appropriate tool and removed.

A wetting agent must then be used to spray any layer of dry material that is exposed beneath the mesh, the surface of the stripped underlying structure, and the inside of the glove bag.

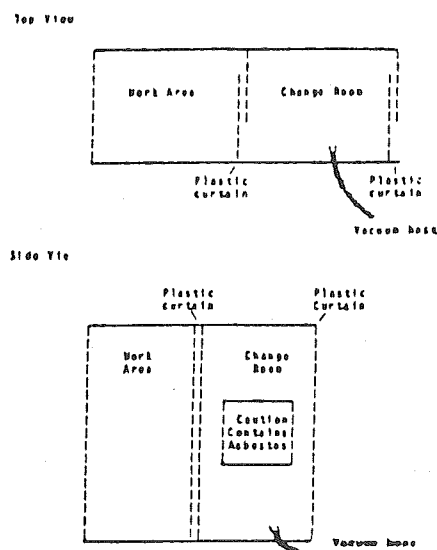
(v) After removal of the layer of asbestos-containing material, the pipe or surface from which asbestos has been removed must be thoroughly cleaned with a wire brush and wet wiped with a wetting agent until no traces of the asbestos-containing material can be seen.

(vi) Any asbestos-containing insulation edges that have been exposed as a result of the removal or maintenance activity must be encapsulated with bridging encapsulant to ensure that the edges do not release asbestos fibers to the atmosphere after the glove bag has been removed.

(vii) When the asbestos removal and encapsulation have been completed, a vacuum hose from a HEPA-filtered vacuum must be inserted into the glove bag

through the port to remove any air in the bag that may contain asbestos fibers. When the air has been removed from the bag, the bag should be squeezed tightly (as close to the top as possible), twisted, and sealed with tape, to keep the asbestos materials safely in the bottom of the bag. The HEPA vacuum can then be removed from the bag and the glove bag itself can be removed from the work area to be disposed of properly (Figure J-1(D)).

Figure J-2. Schematic of mini-enclosure



(6) Mini-enclosures. In some instances, such as removal of asbestos from a small ventilation system or from a short length of duct, a glove bag may not be either large enough or of the proper shape to enclose the work area. In such cases, a mini-enclosure can be built around the area where small-scale, short-duration asbestos maintenance or renovation work is to be performed (Figure J-2). Such an enclosure should be constructed of 6-mil-thick polyethylene plastic sheeting and can be small enough to restrict entry to the asbestos work area to one worker.

For example, a mini-enclosure can be built in a small utility closet when asbestos-containing duct covering is to be removed. The enclosure is constructed by:

(a) Affixing plastic sheeting to the walls with spray adhesive and tape;

(b) Covering the floor with plastic and sealing the plastic covering the floor to the plastic on the walls;

(c) Sealing any penetrations such as pipes or electrical conduits with tape; and

(d) Constructing a small change room (approximately three feet square) made of 6-mil-thick polyethylene plastic supported by two-inch by four-inch lumber (the plastic should be attached to the lumber supports with staples or spray adhesive and tape).

The change room should be contiguous to the mini enclosure, and is necessary to allow the worker to vacuum off his protective coveralls and remove them before leaving the work area. While inside the enclosure, the worker should wear Tyvek¹ disposable coveralls and use

the appropriate HEPA filtered dual cartridge respiratory protection.

The advantages of mini-enclosures are that they limit the spread of asbestos contamination, reduce the potential exposure of bystanders and other workers who may be working in adjacent areas, and are quick and easy to install. The disadvantage of mini-enclosures is that they may be too small to contain the equipment necessary to create a negative pressure within the enclosure; however, the double layer of plastic sheeting will serve to restrict the release of asbestos fibers to the area outside the enclosure.

(7) Removal of entire structures. When pipes are insulated with asbestos-containing materials, removal of the entire pipe may be more protective, easier, and more cost-effective than stripping the asbestos insulation from the pipe. Before such a pipe is cut, the asbestos-containing insulation must be wrapped with 6-mil polyethylene plastic and securely sealed with duct tape or equivalent. This plastic covering will prevent asbestos fibers from becoming airborne as a result of the vibration created by the power saws used to cut the pipe. If possible, the pipes should be cut at locations that are not insulated to avoid disturbing the asbestos. If a pipe is completely insulated with asbestos-containing materials, small sections should be stripped using the glove-bag method described above before the pipe is cut at the stripped sections.

(8) Enclosure. The decision to enclose rather than remove asbestos-containing material from an area depends on the building owner's preference, i.e., for removal or containment. Owners consider such factors as cost effectiveness, the physical configuration of the work area, and the amount of traffic in the area when determining which abatement method to use.

If the owner chooses to enclose the structure rather than to remove the asbestos-containing material insulating it, a solid structure (airtight walls and ceilings) must be built around the asbestos covered pipe or structure to prevent the release of asbestos-containing materials into the area beyond the enclosure and to prevent disturbing these materials by casual contact during future maintenance operations.

Such a permanent (i.e., for the life of the building) enclosure should be built of new construction materials and should be impact resistant and airtight. Enclosure walls should be made of tongue-and-groove boards, boards with spine joints, or gypsum boards having taped seams. The underlying structure must be able to support the weight of the enclosure. (Suspended ceilings with laid in panels do not provide airtight enclosures and should not be used to enclose structures covered with asbestos-containing materials.) All joints between the walls and ceiling of the enclosure should be caulked to prevent the escape of asbestos fibers. During the installation of enclosures, tools that are used (such as drills or rivet tools) should be equipped with HEPA-filtered vacuums. Before constructing the enclosure, all electrical conduits, telephone lines, recessed lights, and pipes in the area to be enclosed should be moved to ensure that

the enclosure will not have to be reopened later for routine or emergency maintenance. If such lights or other equipment cannot be moved to a new location for logistic reasons, or if moving them will disturb the asbestos-containing materials, removal rather than enclosure of the asbestos-containing materials is the appropriate control method to use.

(9) Maintenance program. An asbestos maintenance program must be initiated in all facilities that have asbestos-containing materials. Such a program should include:

Development of an inventory of all asbestos-containing materials in the facility;

Periodic examination of all asbestos-containing materials to detect deterioration;

Written procedures for handling asbestos materials during the performance of small-scale, short-duration maintenance and renovation activities;

Written procedures for asbestos disposal; and

Written procedures for dealing with asbestos-related emergencies.

Members of the building's maintenance engineering staff (electricians, heating/air conditioning engineers, plumbers, etc.) who may be required to handle asbestos-containing materials should be trained in safe procedures. Such training should include at a minimum:

Information regarding types of asbestos and its various uses and forms;

Information on the health effects associated with asbestos exposure;

Descriptions of the proper methods of handling asbestos-containing materials; and

Information on the use of HEPA-equipped dual cartridge respiratory and other personal protection during maintenance activities.

(10) Prohibited activities. The training program for the maintenance engineering staff should describe methods of handling asbestos-containing materials as well as routine maintenance activities that are prohibited when asbestos-containing materials are involved. For example, maintenance staff employees should be instructed:

Not to drill holes in asbestos-containing materials;

Not to hang plants or pictures on structures covered with asbestos-containing materials;

Not to sand asbestos-containing floor tile;

Not to damage asbestos-containing materials while moving furniture or other objects;

Not to install curtains, drapes, or dividers in such a way that they damage asbestos-containing materials;

Not to dust floors, ceilings, moldings or other surfaces in asbestos-contaminated environments with a dry brush or sweep with a dry broom;

Not to use an ordinary vacuum to clean up asbestos-containing debris;

Not to remove ceiling tiles below asbestos-containing materials without wearing the proper respiratory protection, clearing the area of other people, and observing asbestos removal waste disposal procedures;

Not to remove ventilation system filters dry; and

Not to shake ventilation system filters.

* Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

¹ Mention of trade names or commercial products does not constitute endorsement or recommendation for use.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07753, filed 11/30/87.]

WAC 296-62-07761 Nonasbestiform tremolite, anthophyllite, and actinolite. (1) Definitions. For the purpose of this section:

(a) "Department" means the department of labor and industries.

(b) "Director" means the director of the department of labor and industries or his/her authorized representatives.

(c) "Employee exposure" means that exposure to airborne tremolite, anthophyllite, actinolite, or a combination of these minerals that would occur if the employee were not using respiratory protective equipment.

(d) "Fiber" means a particulate form of tremolite, anthophyllite, or actinolite, five micrometers or longer, with a length-to-diameter ratio of at least three to one.

(e) "Tremolite, anthophyllite, or actinolite" means the nonasbestos form of these minerals, and any of these minerals that have been chemically treated and/or altered.

(2) Permissible exposure to airborne concentrations of tremolite, anthophyllite, and actinolite fibers including any combination of these minerals.

(a) The eight-hour time-weighted average airborne concentration of tremolite, anthophyllite, and actinolite fibers to which any employee may be exposed shall not exceed two fibers per cubic centimeter of air, as determined by the method prescribed in subsection (5) of this section.

(b) Ceiling concentration. No employee shall be exposed at any time to an airborne concentration of tremolite, anthophyllite, and actinolite fibers in excess of ten fibers per cubic centimeter of air, as determined by the method prescribed in subsection (5) of this section.

(3) Methods of compliance.

(a) Engineering methods.

(i) Engineering controls. Engineering controls, such as, but not limited to, isolation, enclosure, exhaust ventilation, and dust collection, shall be used to meet the exposure limits prescribed in subsection (2) of this section.

(ii) Local exhaust ventilation. Local exhaust ventilation and dust collection systems shall be designed, constructed, installed, and maintained in accordance with the American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI Z9.2-1971, which is incorporated by reference herein.

(iii) Particular tools. All hand-operated and power-operated tools which may produce or release tremolite, anthophyllite, and actinolite fibers in excess of the exposure limits prescribed in subsection (2) of this section, such as, but not limited to, saws, scorers, abrasive wheels, and drills, shall be provided with local exhaust ventilation systems in accordance with (a)(ii) of this subsection.

(b) Work practices.

(i) Wet methods. Insofar as practicable, tremolite, anthophyllite, and actinolite shall be handled, mixed, applied, removed, cut, scored, or otherwise worked in a wet state sufficient to prevent the emission of airborne fibers in excess of the exposure limits prescribed in subsection (2) of this section, unless the usefulness of the product would be diminished thereby.

(ii) Particular products and operations. No tremolite, anthophyllite, and actinolite cement, mortar, coating, grout, plaster, or similar material containing tremolite, anthophyllite, and actinolite shall be removed from bags, cartons, or other containers in which they are shipped, without being either wetted, or enclosed, or ventilated so as to prevent effectively the release of airborne tremolite, anthophyllite, and actinolite fibers in excess of the limits prescribed in subsection (2) of this section.

(iii) Spraying, demolition, or removal. Employees engaged in the spraying of tremolite, anthophyllite, and actinolite, the removal, or demolition of pipes, structures, or equipment covered or insulated with tremolite, anthophyllite, and actinolite, and in the removal or demolition of tremolite, anthophyllite, and actinolite insulation or coverings shall be provided with Type "C" supplied air respiratory equipment and with special clothing in accordance with subsection (4)(c) of this section.

(4) Personal protective equipment.

(a) Compliance with the exposure limits prescribed by subsection (2) of this section may not be achieved by the use of respirators or shift rotation of employees except:

(i) During the time period necessary to install the engineering controls and to institute the work practices required by subsection (3) of this section.

(ii) In work situations in which the methods prescribed in subsection (3) of this section are either technically not feasible or feasible to an extent insufficient to reduce the airborne concentration of tremolite, anthophyllite, and actinolite fibers below the limits prescribed by subsection (2) of this section; or

(iii) In emergencies.

(iv) Where both respirators and personnel rotation are allowed by (a)(i), (ii), or (iii) of this subsection, and both are practicable, personnel rotation shall be preferred and used.

(b) Where a respirator is permitted by (a)(i), (ii), or (iii) of this subsection, it shall comply with the applicable provisions of WAC 296-62-071.

(i) Respirator selection. The employer shall select, provide, and ensure the use of respirators, at no cost to the employees, in accordance with the respirator protection factors listed in Table 1 of this section.

(ii) Establishment of a respirator program.

(A) The employer shall establish a respirator program in accordance with the requirements of chapter 296-62 WAC.

(B) No employee shall be assigned to tasks requiring the use of respirators if, based upon his most recent examination, an examining physician determines that the employee will be unable to function normally wearing a respirator, or that the safety or health of the employee

or other employees will be impaired by his/her use of a respirator. Such employee shall be rotated to another job or given the opportunity to transfer to a different position whose duties he/she is able to perform with the same employer, in the same geographical area and with the same seniority, status, and rate of pay he/she had just prior to such transfer, if such a different position is available.

(c) Special clothing: The employer shall provide at no cost, and require the use of, special clothing, such as coveralls or similar whole body clothing, head coverings, gloves, and foot coverings for any employee exposed to an airborne concentration of tremolite, anthophyllite, and actinolite fibers, which exceeds 2 f/cc.

(d) Change rooms:

(i) At any place of employment exposed to an airborne concentration of tremolite, anthophyllite, and actinolite fibers in excess of the exposure limits prescribed in subsection (2) of this section, the employer shall provide change rooms for employees.

(ii) Clothes lockers: The employer shall provide two separate lockers or containers for each employee, so separated or isolated as to prevent contamination of the employee's street clothes from his/her work clothes.

(iii) Laundering:

(A) Laundering of tremolite, anthophyllite, and actinolite contaminated clothing shall be done so as to prevent the release of airborne fibers in excess of the exposure limits prescribed in subsection (2) of this section.

(B) Any employer who gives contaminated clothing to another person for laundering shall inform such person of the requirement in (d) of this subsection to effectively prevent the release of airborne tremolite, anthophyllite, and actinolite fibers in excess of the exposure limits prescribed in subsection (2) of this section.

(C) Contaminated clothing shall be transported in sealed impermeable bags, or other closed, impermeable containers, and labeled in accordance with subsection (7)(b) of this section.

(5) Method of measurement. All determinations of airborne concentrations of tremolite, anthophyllite, and actinolite fibers shall be made by the membrane filter method at 400-450 X (magnification) four millimeter objective with phase contrast illumination.

(6) Monitoring.

(a) Initial determinations. Every employer shall cause every place of employment where tremolite, anthophyllite, and actinolite fibers are released to be monitored in such a way as to determine whether every employee's exposure to tremolite, anthophyllite, and actinolite fibers is below the limits prescribed in subsection (2) of this section. If the limits are exceeded, the employer shall immediately undertake a compliance program in accordance with subsection (3) of this section.

(b) Personal monitoring.

(i) Samples shall be collected from within the breathing zone of the employees, on membrane filters of 0.8 micrometer porosity mounted in an open-face filter holder. Samples shall be taken for the determination of

the eight-hour time-weighted average airborne concentration and of the ceiling concentration of tremolite, anthophyllite, and actinolite fibers.

(ii) Sampling frequency and patterns. After the initial determinations required by (a) of this subsection, samples shall be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of employees. In no case shall the sampling be done at intervals greater than six months for employees whose exposure to tremolite, anthophyllite, and actinolite may reasonably be foreseen to exceed the limits prescribed by subsection (2) of this section.

(c) Environmental monitoring.

(i) Samples shall be collected from areas of a work environment which are representative of the airborne concentration of tremolite, anthophyllite, and actinolite fibers which may reach the breathing zone of employees. Samples shall be collected on a membrane filter of 0.8 micrometer porosity mounted in an open-face filter holder. Samples shall be taken for the determination of the eight-hour time-weighted average airborne concentration and of the ceiling concentration of tremolite, anthophyllite, and actinolite fibers.

(ii) Sampling frequency and patterns. After the initial determinations required by (a) of this subsection, samples shall be of such frequency and pattern as to represent with reasonable accuracy the levels of exposure of the employees. In no case shall sampling be at intervals greater than six months for employees whose exposures to tremolite, anthophyllite, and actinolite may reasonably be foreseen to exceed the exposure limits prescribed in subsection (2) of this section.

(d) Employee observation of monitoring. Affected employees, or their representatives, shall be given a reasonable opportunity to observe any monitoring required by this subsection and shall have access to the records thereof.

(7) Caution signs and labels.

(a) Caution signs.

(i) Posting. Caution signs shall be provided and displayed at each location where airborne concentrations of tremolite, anthophyllite, and actinolite fibers are reasonably expected to be released or where airborne concentrations of tremolite, anthophyllite, and actinolite fibers may be in excess of the exposure limits prescribed in subsection (2) of this section. Signs shall be posted at such a distance from such a location so that an employee may read the signs and take necessary protective steps before entering the area marked by the signs. Signs shall be posted at all approaches to areas containing airborne tremolite, anthophyllite, and actinolite fibers.

(ii) Sign specifications. The warning signs required by (a)(i) of this subsection shall conform to the requirements of 20" X 14" vertical format signs specified in WAC 296-24-14007(4) and to this subsection. The signs shall display the following legend in the lower panel, with letter sizes and styles of a visibility at least equal to that specified in this subdivision.

Legend	Notation
Tremolite, anthophyllite, and actinolite _____	1" Sans Serif, Gothic or Block.
Dust hazard _____	3/4" Sans Serif, Gothic or Block.
Avoid breathing dust _____	1/4" Gothic.
Wear assigned protective equipment _____	1/4" Gothic.
Do not remain in area unless your work requires it _____	1/4" Gothic.
Breathing tremolite, anthophyllite, and actinolite fibers may be hazardous to your health _____	14 point Gothic.

Spacing between lines shall be at least equal to the height of the upper of any two lines.

(b) Caution labels.

(i) Labeling. Caution labels shall be affixed to all raw materials, mixtures, scrap, waste, debris, and other products containing tremolite, anthophyllite, and actinolite fibers, or to their containers, except that no label is required where fibers have been modified by a bonding agent, coating, binder, or other material so that during any reasonably foreseeable use, handling, storage, disposal, processing, or transportation, no airborne fibers will be released.

(ii) Label specifications. The caution labels required by (b)(i) of this subsection shall be printed in letters of sufficient size and contrast as to be readily visible and legible. The label shall state:

CAUTION

Contains Tremolite, Anthophyllite, or Actinolite Fibers

Avoid Creating Dust

Breathing Tremolite, Anthophyllite, or Actinolite Fibers
May Cause

Serious Bodily Harm

(8) Housekeeping.

(a) Cleaning. All external surfaces in any place of employment shall be maintained free of accumulations of tremolite, anthophyllite, and actinolite fibers.

(b) Waste disposal. Tremolite, anthophyllite, and actinolite waste, scrap, debris, bags, containers, equipment, and contaminated clothing, consigned for disposal, shall be collected and disposed of in sealed impermeable bags at least 6 mils in thickness, or other closed, impermeable containers.

(c) Deterioration. Friable tremolite, anthophyllite, or actinolite and friable tremolite, anthophyllite, or actinolite containing material which has become damaged or deteriorated shall be repaired, enclosed, encapsulated, or removed.

(9) Recordkeeping.

(a) Exposure records. Every employer shall maintain records of any personal or environmental monitoring required by subsection (6) of this section. Records shall be maintained for a period of at least thirty years and shall be made available upon request to the director of the department of labor and industries.

(b) Access. Employee exposure records required by this subsection shall be provided upon request to employees, designated representatives, and the assistant director in accordance with WAC 296-62-05201 through 296-62-05209 and WAC 296-62-05213 through 296-62-05217.

(c) Employee notification. Any employee found to have been exposed at any time to an airborne concentration of tremolite, anthophyllite, or actinolite fibers in excess of the limits prescribed in subsection (2) of this section shall be notified in writing of the exposure as soon as practicable but not later than five days of the finding. The employee shall also be timely notified of the corrective action being taken.

(10) Medical examinations.

(a) General. The employer shall provide or make available at his/her cost, medical examinations relative to exposure to tremolite, anthophyllite, or actinolite required by this section.

(b) Preplacement. The employer shall provide or make available to each of his/her employees, within thirty calendar days following his/her first employment in an occupation exposed to an airborne concentration of tremolite, anthophyllite, or actinolite fibers, a comprehensive medical examination, which shall include, as a minimum, a chest roentgenogram (posterior-anterior fourteen by seventeen inches), a history to elicit symptomatology of respiratory disease, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at one second ($FEV_{1.0}$).

(c) Annual examinations. Every employer shall provide or make available on an annual basis, comprehensive medical examinations to each of his/her employees engaged in occupations exposed to airborne concentrations of tremolite, anthophyllite, and actinolite fibers. Such annual examination shall include, as a minimum, a chest roentgenogram (posterior-anterior fourteen by seventeen inches), a history to elicit symptomatology of respiratory disease, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at one second ($FEV_{1.0}$).

(d) Termination of employment. The employer shall provide, or make available, within thirty calendar days before or after the termination of employment of any employee engaged in an occupation exposed to an airborne concentration of tremolite, anthophyllite, or actinolite fibers, a comprehensive medical examination which shall include, as a minimum, a chest roentgenogram (posterior-anterior fourteen by seventeen inches), a history to elicit symptomatology of respiratory disease, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at one second ($FEV_{1.0}$).

(e) Recent examinations. No medical examination is required of any employee, if adequate records show that the employee has been examined in accordance with this subsection within the past one-year period.

(f) Medical records.

(i) Maintenance. Employers of employees examined pursuant to this subsection shall cause to be maintained

complete and accurate records of all such medical examinations. Records shall be retained by employers for at least thirty years.

(ii) Access. Records of the medical examinations required by this subsection shall be provided upon request to employees, designated representative and the assistant director in accordance with WAC 296-62-05201 through 296-62-05209 and WAC 296-62-05213 through 296-62-05217. These records shall also be provided upon request to the director of the department of labor and industries. Any physician who conducts a medical examination required by this subsection shall furnish to the employer of the examined employee all the information specifically required by this subsection, and any other medical information related to occupational exposure to tremolite, anthophyllite, and actinolite fibers.

TABLE 1--RESPIRATORY PROTECTION FOR TREMOLITE, ANTHOPHYLLITE, AND ACTINOLITE FIBERS

CONCENTRATION OF TREMOLITE, ANTHOPHYLLITE, ACTINOLITE, OR A COMBINATION OF THESE MINERALS	REQUIRED RESPIRATOR ^a
Not in excess of 2 f/cc.	1. Half-mask, air-purifying respirator equipped with high-efficiency cartridge filters. ^b
Not in excess of 10 f/cc.	1. Full facepiece air-purifying respirator equipped with high-efficiency filters.
Not in excess of 20 f/cc	1. Any powered air-purifying respirator equipped with high-efficiency filters. 2. Any supplied-air respirator operated in continuous flow mode.
Not in excess of 200 f/cc.	1. Full facepiece supplied-air respirator operated in pressure demand mode.
Greater than 200 f/cc or unknown concentration.	1. Full facepiece supplied-air respirator operated in pressure-demand mode equipped with either an auxiliary positive pressure self-contained breathing apparatus or a HEPA filter. 2. Full facepiece positive-pressure self-contained breathing apparatus (SCBA).

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

b. A high-efficiency filter means a filter that is capable of trapping and retaining at least 99.97 percent of all monodispersed particles of 0.3 micrometers mean aerodynamic diameter or larger.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-07761, filed 11/30/87.]

PART N--COTTON DUST

WAC 296-62-14531 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-62-14533 Cotton dust. (1) Scope and application.

(a) This section, in its entirety, applies to the control of employee exposure to cotton dust in all workplaces where employees engage in yarn manufacturing, engage in slashing and weaving operations, or work in waste houses for textile operations.

(b) This section does not apply to the handling or processing of woven or knitted materials; to maritime operations covered by chapters 296-56 and 296-304 WAC; to harvesting or ginning of cotton; or to the construction industry.

(c) Only subsection (8) Medical surveillance, subsection (11) (b) Medical surveillance, subsection (11)(c) Availability, subsection (11)(d) Transfer of records, and Appendices B, C, and D of this section apply in all work places where employees exposed to cotton dust engage in cottonseed processing or waste processing operations.

(d) This section applies to yarn manufacturing and slashing and weaving operations exclusively using washed cotton (as defined by subsection (14) of this section) only to the extent specified by subsection (14) of this section.

(e) This section, in its entirety, applies to the control of all employees exposure to the cotton dust generated in the preparation of washed cotton from opening until the cotton is thoroughly wetted.

(f) This section does not apply to knitting, classing or warehousing operations except that employers with these operations, if requested by WISHA, shall grant WISHA access to their employees and workplaces for exposure monitoring and medical examinations for purposes of a health study to be performed by WISHA on a sampling basis.

(2) Definitions applicable to this section:

(a) "Blow down" – the cleaning of equipment and surfaces with compressed air.

(b) "Blow off" – the use of compressed air for cleaning of short duration and usually for a specific machine or any portion of a machine.

(c) "Cotton dust" – dust present in the air during the handling or processing of cotton, which may contain a mixture of many substances including ground-up plant matter, fiber, bacteria, fungi, soil, pesticides, noncotton plant matter and other contaminants which may have accumulated with the cotton during the growing, harvesting and subsequent processing or storage periods. Any dust present during the handling and processing of cotton through the weaving or knitting of fabrics, and dust present in other operations or manufacturing processes using raw or waste cotton fibers or cotton fiber byproducts from textile mills are considered cotton dust within this definition. Lubricating oil mist associated with weaving operations is not considered cotton dust.

(d) "Director" – the director of labor and industries or his authorized representative.

(e) "Equivalent instrument" – a cotton dust sampling device that meets the vertical elutriator equivalency requirements as described in subsection (4)(a)(iii) of this section.

(f) "Lint-free respirable cotton dust" – particles of cotton dust of approximately 15 microns or less aerodynamic equivalent diameter.

(g) "Vertical elutriator cotton dust sampler" or "vertical elutriator" – a dust sampler which has a particle size cut-off at approximately 15 microns aerodynamic equivalent diameter when operating at the flow rate of 7.4 ± 0.2 liters per minute.

(h) "Waste processing" – waste recycling (sorting, blending, cleaning and willowing) and garnetting.

(i) "Yarn manufacturing" – all textile mill operations from opening to, but not including, slashing and weaving.

(3) Permissible exposure limits and action levels.

(a) Permissible exposure limits (PEL).

(i) The employer shall assure that no employee who is exposed to cotton dust in yarn manufacturing and cotton washing operations is exposed to airborne concentrations of lint-free respirable cotton dust greater than $200 \mu\text{g}/\text{m}^3$ mean concentration, averaged over an eight-hour period, as measured by a vertical elutriator or an equivalent instrument.

(ii) The employer shall assure that no employee who is exposed to cotton dust in textile mill waste house operations or is exposed in yarn manufacturing to dust from "lower grade washed cotton" as defined in subsection (14)(e) of this section is exposed to airborne concentrations of lint-free respirable cotton dust greater than $500 \mu\text{g}/\text{m}^3$ mean concentration, averaged over an eight-hour period, as measured by a vertical elutriator or an equivalent instrument.

(iii) The employer shall assure that no employee who is exposed to cotton dust in the textile processes known as slashing and weaving is exposed to airborne concentrations of lint-free respirable cotton dust greater than $750 \mu\text{g}/\text{m}^3$ mean concentration, averaged over an eight-hour period, as measured by a vertical elutriator or an equivalent instrument.

(b) Action levels.

(i) The action level for yarn manufacturing and cotton washing operations is an airborne concentration of lint-free respirable cotton dust of $100 \mu\text{g}/\text{m}^3$ mean concentration, averaged over an eight-hour period, as measured by a vertical elutriator or an equivalent instrument.

(ii) The action level for waste houses for textile operations is an airborne concentration of lint-free respirable cotton dust of $250 \mu\text{g}/\text{m}^3$ mean concentration, averaged over an eight-hour period, as measured by a vertical elutriator or an equivalent instrument.

(iii) The action level for the textile processes known as slashing and weaving is an airborne concentration of lint-free respirable cotton dust of $375 \mu\text{g}/\text{m}^3$ mean concentration, averaged over an eight-hour period, as measured by a vertical elutriator or an equivalent instrument.

(4) Exposure monitoring and measurement.

(a) General.

(i) For the purposes of this section, employee exposure is that exposure which would occur if the employee were not using a respirator.

(ii) The sampling device to be used shall be either the vertical elutriator cotton dust sampler or an equivalent instrument.

(iii) If an alternative to the vertical elutriator cotton dust sampler is used, the employer shall establish equivalency by demonstrating that the alternative sampling devices:

(A) It collects respirable particulates in the same range as the vertical elutriator (approximately 15 microns);

(B) Replicate exposure data used to establish equivalency are collected in side-by-side field and laboratory comparisons; and

(C) A minimum of 100 samples over the range of 0.5 to 2 times the permissible exposure limit are collected, and ninety percent of these samples have an accuracy range of plus or minus twenty-five percent of the vertical elutriator reading with a ninety-five percent confidence level as demonstrated by a statistically valid protocol. (An acceptable protocol for demonstrating equivalency is described in Appendix E of this section.)

(iv) WISHA will issue a written opinion stating that an instrument is equivalent to a vertical elutriator cotton dust sampler if:

(A) A manufacturer or employer requests an opinion in writing and supplies the following information:

(I) Sufficient test data to demonstrate that the instrument meets the requirements specified in this paragraph and the protocol specified in Appendix E of this section;

(II) Any other relevant information about the instrument and its testing requested by WISHA; and

(III) A certification by the manufacturer or employer that the information supplied is accurate, and

(B) If WISHA finds, based on information submitted about the instrument, that the instrument meets the requirements for equivalency specified by this subsection.

(b) Initial monitoring. Each employer who has a place of employment within the scope of subsections (1)(a), (d) or (e) of this section shall conduct monitoring by obtaining measurements which are representative of the exposure of all employees to airborne concentrations of lint-free respirable cotton dust over an eight-hour period. The sampling program shall include at least one determination during each shift for each work area.

(c) Periodic monitoring.

(i) If the initial monitoring required by (4)(b) of this section or any subsequent monitoring reveals employee exposure to be at or below the permissible exposure limit, the employer shall repeat the monitoring for those employees at least annually.

(ii) If the initial monitoring required by (4)(b) of this section or any subsequent monitoring reveals employee exposure to be above the PEL, the employer shall repeat the monitoring for those employees at least every six months.

(iii) Whenever there has been a production, process, or control change which may result in new or additional exposure to cotton dust, or whenever the employer has any other reason to suspect an increase in employee exposure, the employer shall repeat the monitoring and

measurements for those employees affected by the change or increase.

(d) Employee notification.

(i) Within twenty working days after the receipt of monitoring results, the employer shall notify each employee in writing of the exposure measurements which represent that employee's exposure.

(ii) Whenever the results indicate that the employee's exposure exceeds the applicable permissible exposure limit specified in subsection (3) of this section, the employer shall include in the written notice a statement that the permissible exposure limit was exceeded and a description of the corrective action taken to reduce exposure below the permissible exposure limit.

(5) Methods of compliance.

(a) Engineering and work practice controls. The employer shall institute engineering and work practice controls to reduce and maintain employee exposure to cotton dust at or below the permissible exposure limit specified in subsection (3) of this section, except to the extent that the employer can establish that such controls are not feasible.

(b) Whenever feasible engineering and work practice controls are not sufficient to reduce employee exposure to or below the permissible exposure limit, the employer shall nonetheless institute these controls to immediately reduce exposure to the lowest feasible level, and shall supplement these controls with the use of respirators which shall comply with the provisions of subsection (6) of this section.

(c) Compliance program.

(i) Where the most recent exposure monitoring data indicates that any employee is exposed to cotton dust levels greater than the permissible exposure limit, the employer shall establish and implement a written program sufficient to reduce exposures to or below the permissible exposure limit solely by means of engineering controls and work practices as required by (a) of this subsection.

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

(A) A description of each operation or process resulting in employee exposure to cotton dust;

(B) Engineering plans and other studies used to determine the controls for each process;

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

(D) Monitoring data obtained in accordance with subsection (4) of this section;

(E) A detailed schedule for development and implementation of engineering and work practice controls, including exposure levels projected to be achieved by such controls;

(F) Work practice program; and

(G) Other relevant information.

(iii) The employer's schedule as set forth in the compliance program, shall project completion of the implementation of the compliance program no later than March 27, 1984 or as soon as possible if monitoring after March 27, 1984 reveals exposures over the PEL, except as provided in (13)(b)(ii)(B) of this section.

(iv) The employer shall complete the steps set forth in his program by the dates in the schedule.

(v) Written programs shall be submitted, upon request, to the director, and shall be available at the worksite for examination and copying by the director, and any affected employee or their designated representatives.

(vi) The written programs required under subsection (5)(c) of this section shall be revised and updated at least every six months to reflect the current status of the program and current exposure levels.

(d) Mechanical ventilation. When mechanical ventilation is used to control exposure, measurements which demonstrate the effectiveness of the system to control exposure, such as capture velocity, duct velocity, or static pressure shall be made at reasonable intervals.

(6) Use of respirators.

(a) General. Where the use of respirators is required under this section, the employer shall provide, at no cost to the employee, and assure the use of respirators which comply with the requirements of this subsection (6). Respirators shall be used in the following circumstances:

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

(ii) During maintenance and repair activities in which engineering and work practice controls are not feasible;

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

(iv) In operations specified under subsection (7)(a) of this section; and

(v) Whenever an employee requests a respirator.

(b) Respirator selection.

(i) Where respirators are required under this section, the employer shall select the appropriate respirator from Table I and shall assure that the employee uses the respirator provided.

4. Supplied air respirators are not required but are permitted under the following conditions: Cotton dust concentration not greater than 10X the PEL—Any supplied air respirator; not greater than 100X the PEL—Any supplied air respirator with full facepiece, helmet or hood; greater than 100X the PEL—A supplied air respirator operated in positive pressure mode.

(ii) The employer shall select respirators from those tested and approved for protection against dust by the National Institute for Occupational Safety and Health (NIOSH) under the provisions of 30 CFR Part 11.

(iii) Whenever respirators are required by this section for concentrations not greater than 100 x the applicable permissible exposure limit, the employer shall, upon the request of the employee, provide a powered air purifying respirator with a high efficiency particulate filter in lieu of the respirator specified in paragraphs (a), (b), or (c) of Table I.

(iv) Whenever a physician determines that an employee who works in an area in which the dust level exceeds the PEL is unable to wear any form of respirator, including a powered air purifying respirator, the employee shall be given the opportunity to transfer to another position which is available or which later becomes available having a dust level at or below the PEL. The employer shall assure that an employee who is transferred from an area in which the dust level exceeds the PEL due to an inability to wear a respirator suffers no reduction in current wage rate or other benefits as a result of the transfer.

(c) Respirator program. The employer shall institute a respirator program in accordance with WAC 296-62-071.

(d) Respirator usage.

(i) The employer shall assure that the respirator used by each employee exhibits minimum face piece leakage and that the respirator is fitted properly.

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

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

(7) Work practices. Each employer shall, regardless of the level of employee exposure, immediately establish and implement a written program of work practices which shall minimize cotton dust exposure. The following shall be included where applicable:

(a) Compressed air "blow down" cleaning shall be prohibited, where alternative means are feasible. Where compressed air is used for cleaning, the employees performing the "blow down" or "blow off" shall wear suitable respirators. Employees whose presence is not required to perform "blow down" or "blow off" shall be required to leave the area affected by the "blow down" or "blow off" during this cleaning operation.

(b) Cleaning of clothing or floors with compressed air shall be prohibited.

(c) Floor sweeping shall be performed with a vacuum or with methods designed to minimize dispersal of dust.

TABLE I

Cotton dust concentration	Required respirator
Not greater than—	
(a) 5 x the applicable permissible exposure limit (PEL).	A disposable respirator with a particulate filter.
(b) 10 x the applicable PEL.	A quarter or half-mask respirator, other than a disposable respirator, equipped with particulate filters.
(c) 100 x the applicable PEL.	A full facepiece respirator equipped with high-efficiency particulate filters.
(d) Greater than 100 x the applicable PEL.	A powered air-purifying respirator equipped with high-efficiency particulate filters.

Notes

1. A disposable respirator means the filter element is an inseparable part of the respirator.

2. Any respirators permitted at higher environmental concentrations can be used at lower concentrations.

3. Self-contained breathing apparatus are not required respirators but are permitted respirators.

(d) In areas where employees are exposed to concentrations of cotton dust greater than the permissible exposure limit, cotton and cotton waste shall be stacked, sorted, baled, dumped, removed or otherwise handled by mechanical means, except where the employer can show that it is infeasible to do so. Where infeasible, the method used for handling cotton and cotton waste shall be the method which reduces exposure to the lowest level feasible.

(8) Medical surveillance.

(a) General.

(i) Each employer covered by the standard shall institute a program of medical surveillance for all employees exposed to cotton dust.

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

(iii) Persons other than licensed physicians, who administer the pulmonary function testing required by this section shall have completed a NIOSH approved training course in spirometry.

(b) Initial examinations. The employer shall provide medical surveillance to each employee who is or may be exposed to cotton dust. For new employees' this examination shall be provided prior to initial assignment. The medical surveillance shall include at least the following:

(i) A medical history;

(ii) The standardized questionnaire contained in WAC 296-62-14537; and

(iii) A pulmonary function measurement, including a determination of forced vital capacity (FVC) and forced expiratory volume in one second (FEV_1), the FEV_1 /FVC ratio, and the percentage that the measured values of FEV_1 and FVC differ from the predicted values, using the standard tables in WAC 296-62-14539. These determinations shall be made for each employee before the employee enters the workplace on the first day of the work week, preceded by at least thirty-five hours of no exposure to cotton dust. The tests shall be repeated during the shift, no less than four hours and no more than ten hours after the beginning of the work shift; and, in any event, no more than one hour after cessation of exposure. Such exposure shall be typical of the employee's usual workplace exposure. The predicted FEV_1 and FVC for blacks shall be multiplied by 0.85 to adjust for ethnic differences.

(iv) Based upon the questionnaire results, each employee shall be graded according to Schilling's byssinosis classification system.

(c) Periodic examinations.

(i) The employer shall provide at least annual medical surveillance for all employees exposed to cotton dust above the action level in yarn manufacturing, slashing and weaving, cotton washing and waste house operations. The employer shall provide medical surveillance at least every two years for all employees exposed to cotton dust at or below the action level, for all employees exposed to cotton dust from washed cotton (except from washed cotton defined in subsection (9)(c) of this section), and for all employees exposed to cotton dust in

cottonseed processing and waste processing operations. Periodic medical surveillance shall include at least an update of the medical history, standardized questionnaire (Appendix B-111), Schilling byssinosis grade, and the pulmonary function measurements in (b)(iii) of this subsection.

(ii) Medical surveillance as required in (c)(i) of this subsection shall be provided every six months for all employees in the following categories:

(A) An FEV_1 of greater than eighty percent of the predicted value, but with an FEV_1 decrement of five percent or 200 ml. on a first working day;

(B) An FEV_1 of less than eighty percent of the predicted value; or

(C) Where, in the opinion of the physician, any significant change in questionnaire findings, pulmonary function results, or other diagnostic tests have occurred.

(iii) An employee whose FEV_1 is less than sixty percent of the predicted value shall be referred to a physician for a detailed pulmonary examination.

(iv) A comparison shall be made between the current examination results and those of previous examinations and a determination made by the physician as to whether there has been a significant change.

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

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

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

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

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

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

(e) Physician's written opinion.

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

(A) The results of the medical examination and tests including the FEV_1 , FVC, and FEV_1 /FVC ratio;

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

(C) The physician's recommended limitations upon the employee's exposure to cotton dust or upon the employee's use of respirators including a determination of whether an employee can wear a negative pressure respirator, and where the employee cannot, a determination of the employee's ability to wear a powered air purifying respirator; and

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

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

(9) Employee education and training.

(a) Training program.

(i) The employer shall provide a training program for all employees exposed to cotton dust and shall assure that each employee is informed of the following:

(A) The acute and long term health hazards associated with exposure to cotton dust;

(B) The names and descriptions of jobs and processes which could result in exposure to cotton dust at or above the PEL.

(C) The measures, including work practices required by subsection (7) of this section, necessary to protect the employee from exposures in excess of the permissible exposure limit;

(D) The purpose, proper use and limitations of respirators required by subsection (6) of this section;

(E) The purpose for and a description of the medical surveillance program required by subsection (8) of this section and other information which will aid exposed employees in understanding the hazards of cotton dust exposure; and

(F) The contents of this standard and its appendices.

(ii) The training program shall be provided prior to initial assignment and shall be repeated annually for each employee exposed to cotton dust, when job assignments or work processes change and when employee performance indicates a need for retraining.

(b) Access to training materials.

(i) Each employer shall post a copy of this section with its appendices in a public location at the workplace, and shall, upon request, make copies available to employees.

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

(10) Signs. The employer shall post the following warning sign in each work area where the permissible exposure limit for cotton dust is exceeded:

WARNING

COTTON DUST WORK AREA
MAY CAUSE ACUTE OR DELAYED LUNG INJURY
(BYSSINOSIS)

RESPIRATORS REQUIRED IN THIS AREA

(11) Recordkeeping.

(a) Exposure measurements.

(i) The employer shall establish and maintain an accurate record of all measurements required by subsection (4) of this section.

(ii) The record shall include:

(A) A log containing the items listed in WAC 296-62-14535 (4)(a), and the dates, number, duration, and results of each of the samples taken, including a description of the procedure used to determine representative employee exposures;

(B) The type of protective devices worn, if any, and length of time worn; and

(C) The names, social security number, job classifications, and exposure levels of employees whose exposure the measurement is intended to represent.

(iii) The employer shall maintain this record for at least twenty years.

(b) Medical surveillance.

(i) The employer shall establish and maintain an accurate medical record for each employee subject to medical surveillance required by subsection (8) of this section.

(ii) The record shall include:

(A) The name and social security number and description of the duties of the employee;

(B) A copy of the medical examination results including the medical history, questionnaire response, results of all tests, and the physician's recommendation;

(C) A copy of the physician's written opinion;

(D) Any employee medical complaints related to exposure to cotton dust;

(E) A copy of this standard and its appendices, except that the employer may keep one copy of the standard and the appendices for all employees, provided that he references the standard and appendices in the medical surveillance record of each employee; and

(F) A copy of the information provided to the physician as required by subsection (8)(d) of this section.

(iii) The employer shall maintain this record for at least twenty years.

(c) Availability.

(i) The employer shall make all records required to be maintained by subsection (11) of this section available to the director for examination and copying.

(ii) Employee exposure measurement records and employee medical records required by this subsection shall be provided upon request to employees, designated representatives, and the assistant director in accordance with WAC 296-62-05201 through 296-62-05209 and 296-62-05213 through 296-62-05217.

(d) Transfer of records.

(i) Whenever the employer ceases to do business, the successor employer shall receive and retain all records required to be maintained by subsection (11) of this section.

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

(iii) At the expiration of the retention period for the records required to be maintained by this section, the employer shall notify the director at least three months prior to the disposal of such records and shall transmit those records to the director if he requests them within that period.

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

(12) Observation of monitoring.

(a) The employer shall provide affected employees or their designated representatives an opportunity to observe any measuring or monitoring of employee exposure

to cotton dust conducted pursuant to subsection (4) of this section.

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

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

(i) An explanation of the measurement procedures;

(ii) An opportunity to observe all steps related to the measurement of airborne concentrations of cotton dust performed at the place of exposure; and

(iii) An opportunity to record the results obtained.

(13) Effective date.

(a) General. This emergency rule is effective upon filing with the code reviser, except as otherwise provided below.

(b) Startup dates.

(i) Initial monitoring. The initial monitoring required by subsection (4)(b) of this section shall be completed as soon as possible but no later than September 27, 1980.

(ii) Methods of compliance;

(A) The engineering and work practice controls required by subsection (5) of this section shall be implemented no later than March 27, 1984 except as set forth in (13)(b)(ii)(B) of this section.

(B) The engineering and work practice controls required by subsection (5) of this section shall be implemented no later than March 27, 1986, for ring spinning operations (including only ring spinning and winding, twisting, spooling, beaming and warping following ring spinning) where the operations meet the following criteria:

(I) The weight of the yarn being run is one hundred percent cotton and the average yarn count by weight is eighteen or below;

(II) The average weight of the yarn run is eighty percent or more cotton and the average yarn count by weight is sixteen or below; or

(III) The average weight of the yarn being run is fifty percent or more cotton and the average yarn count by weight is fourteen or below;

(C) When the provisions of (b)(ii)(B) of this subsection are being relied upon, the following definitions shall apply:

(I) The average cotton content shall be determined by dividing the total weight of cotton in the yarns being run by the total weight of all the yarns being run in the relevant work area.

(II) The average yarn count shall be determined by multiplying the yarn count times the pounds of each particular yarn being run to get the "total hank" for each of the yarns being run in the relevant area. The "total hank" values for all of the yarns being run should then be summed and divided by the total pounds of yarn being run, to produce the average yarn count number for all the yarns being run in the relevant work area.

(D) Where the provisions of (b)(ii)(B) of this subsection are being relied upon, the employer shall update the employer's compliance plan no later than February 13, 1986, to indicate the steps being taken to reduce cotton dust levels to $200 \mu\text{g}/\text{m}^3$ through the use of engineering and work practice controls by March 27, 1986.

(E) Where the provisions of (b)(ii)(B) of this subsection are being relied upon, the employer shall maintain airborne concentrations of cotton dust below $1000 \mu\text{g}/\text{m}^3$ mean concentration averaged over an eight-hour period measured by a vertical elutriator or an equivalent instrument with engineering and work practice controls and shall maintain the permissible exposure limit specified by subsection (3)(a)(i) of this section with any combination of engineering controls, work practice controls and respirators.

(iii) Compliance program. The compliance program required by subsection (5)(c) of this section shall be established no later than March 27, 1981.

(iv) Respirators. The respirators required by subsection (6) of this section shall be provided no later than April 27, 1980.

(v) Work practices. The work practices required by subsection (7) of this section shall be implemented no later than June 27, 1980.

(vi) Medical surveillance. The medical surveillance required by subsection (8) of this section shall be completed no later than March 27, 1981 for the textile industry and no later than June 13, 1986 for the cotton seed processing and waste processing industry.

(vii) Employee education and training. The initial education and training required by subsection (9) of this section shall be completed as soon as possible but no later than June 27, 1980.

(14) Washed cotton.

(a) Exemptions. Cotton, after it has been washed by the processes described in this section is exempt from all or parts of this section as specified if the requirements of this section are met.

(b) Initial requirements.

(i) In order for an employer to qualify as exempt or partially exempt from this standard for operations using washed cotton, the employer must demonstrate that the cotton was washed in a facility which is open to inspection by the director and the employer must provide sufficient accurate documentary evidence to demonstrate that the washing methods utilized meet the requirements of this section.

(ii) An employer who handles or processes cotton which has been washed in a facility not under the employer's control and claims an exemption or partial exemption under this paragraph, must obtain from the cotton washer and make available at the worksite, to the director, or his designated representative, to any affected employee, or to their designated representative the following:

(A) A certification by the washer of the cotton of the grade of cotton, the type of washing process, and that the batch meets the requirements of this section:

(B) Sufficient accurate documentation by the washer of the cotton grades and washing process; and

(C) An authorization by the washer that the director may inspect the washer's washing facilities and documentation of the process.

(c) Medical and dyed cotton. Medical grade (USP) cotton, cotton that has been scoured, bleached and dyed, and mercerized yarn shall be exempt from all provisions of this standard.

(d) Higher grade washed cotton. The handling or processing of cotton classed as "low middling light spotted or better" which has been washed:

(i) On a continuous batt system or a rayon rinse system.

(ii) With water,

(iii) At a temperature of no less than 60°C,

(iv) With a water-to-fiber ratio of no less than 40:1, and

(v) With bacterial levels in the wash water controlled to limit bacterial contamination of the cotton, shall be exempt from all provisions of the standard except the requirements of subsection (8) Medical surveillance, subsection (11)(b) Medical surveillance, subsection (11)(c) Availability, subsection (11)(d) Transfer of records, and Appendices B, C, and D of this section.

(e) Lower grade washed cotton. The handling and processing of cotton of grades lower than "low middling light spotted," that has been washed as specified in (d) of this subsection and has also been bleached, shall be exempt from all provisions of the standard except the requirements of subsection (3)(a) Permissible exposure limits, subsection (4) Exposure monitoring and measurement, subsection (8) Medical surveillance, subsection

(11) Recordkeeping, and Appendices B, C and D of this section.

(f) Mixed grades of washed cotton. If more than one grade of washed cotton is being handled or processed together, the requirements of the grade with the most stringent exposure limit, medical and monitoring requirements shall be followed.

(15) Appendices.

(a) Appendix B (B-I, B-II and B-III), WAC 296-62-14537, Appendix C, WAC 296-62-14539 and Appendix D, WAC 296-62-14541 are incorporated as part of this chapter and the contents of these appendices are mandatory.

(b) Appendix A of this chapter, WAC 296-62-14535 contains information which is not intended to create any additional obligations not otherwise imposed or to detract from any existing obligations.

(c) Appendix E of this chapter is a protocol which may be followed in the validation of alternative measuring devices as equivalent to the vertical elutriator cotton dust sampler. Other protocols may be used if it is demonstrated that they are statistically valid, meet the requirements in subsection (4)(a)(iii) of this section, and are appropriate for demonstrating equivalency.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-62-14533, filed 11/30/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-16-009 (Order 86-28), § 296-62-14533, filed 7/25/86; 82-03-023 (Order 82-1), § 296-62-14533, filed 1/15/82. Statutory Authority: 49.17.040, 49.17.050, and 49.17.240. 81-16-015 (Order 81-20), § 296-62-14533, filed 7/27/81. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-62-14533, filed 11/13/80.]

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

APPENDIX B-I

Respiratory Questionnaire

A. IDENTIFICATION DATA

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

NAME _____ DATE OF INTERVIEW _____
(Surname)

(First Names) DATE OF BIRTH _____ M F

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

RACE W N IND. OTHER (11)

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

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

PRESENT WORK AREA _____ WEIGHT _____ (16,18)

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

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

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

B. COUGH

- (on getting up)†
Do you usually cough first thing in the morning? _____ Yes _____ No _____ (31)
(Count a cough with first smoke or on "first going out of doors."
Exclude clearing throat or a single cough.)
- Do you usually cough during the day or at night? _____ Yes _____ No _____ (32)
(Ignore an occasional cough.)

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

- Do you cough like this on most days for as much as three months a year? _____ Yes _____ No _____ (33)
- Do you cough on any particular day of the week? _____ Yes _____ No _____ (34)
- (1) (2) (3) (4) (5) (6) (7) _____

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

C. PHLEGM or alternative word to suit local custom.

- (on getting up)†
Do you usually bring up any phlegm from your chest first thing in the morning? (Count phlegm with the first smoke or on "first going out of doors." Exclude phlegm from the nose. Count swallowed phlegm.) _____ Yes _____ No _____ (36)
- Do you usually bring up any phlegm from your chest during the day or at night? (Accept twice or more.) _____ Yes _____ No _____ (37)

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

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

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

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

†These words are for subjects who work at night

D. CHEST ILLNESSES

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

†For subjects who usually have phlegm

- During the past 3 years have you had any chest illness which has kept you off work, indoors at home or in bed? (For as long as one week, (1u?)) _____ Yes _____ No _____ (41)

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

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

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

Br. Grade _____

E. TIGHTNESS

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

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

If 'Yes': Which day? Mon. (1) Sometimes (3) Tues. (2) Always (4) Wed. (5) Thur. (6) Fri. (7) Sat. (8) Sun. (47)

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

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

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

If 'Yes': Which day? Mon. (1) Sometimes (3) Tues. (2) Always (4) Wed. (5) Thur. (6) Fri. (7) Sat. (8) Sun. (50)

F. BREATHLESSNESS

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

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

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

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

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

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

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

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

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

Dyspnea Grd. _____ (56)

ON MONDAYS:

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

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

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

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

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

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

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

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

B. Grd. _____ (61)

G. OTHER ILLNESSES AND ALLERGY HISTORY

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

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

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

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

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

H. TOBACCO SMOKING*

Do you smoke?

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

If 'No' to (63):

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

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

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

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

Number of pack years: _____ (72,73)

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

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

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

L. OCCUPATIONAL HISTORY**

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

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

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

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

Type of exposure _____

Length of exposure _____

**Ask only on first interview.

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

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

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

(2) Synthetic or wool

APPENDIX B-II

Respiratory Questionnaire for Nontextile Workers for the Cotton Industry

Identification No.

Interviewer Code

Location

Date of Interview

A. IDENTIFICATION

1. NAME (Last) (First) (Middle Initial)		3. PHONE NUMBER AREA CODE () NO.	4. SOCIAL SECURITY # (optional see below) []
2. CURRENT ADDRESS (Number, Street, or Rural Route, City or Town, County, State, Zip Code)		5. BIRTHDATE (Mo., Day, Yr.)	6. AGE LAST BIRTHDAY
		7. SEX 1 <input type="checkbox"/> Male 2 <input type="checkbox"/> Female	
		8. ETHNIC GROUP OR ANCESTRY 1. <input type="checkbox"/> White, not of Hispanic Origin 2. <input type="checkbox"/> Black, not of Hispanic Origin 3. <input type="checkbox"/> Hispanic 4. <input type="checkbox"/> American Indian or Alaskan Native 5. <input type="checkbox"/> Asian or Pacific Islander 6. <input type="checkbox"/> Other: _____	
9. STANDING HEIGHT _____ (cm)	10. WEIGHT _____	11. WORK SHIFT 1st <input type="checkbox"/> 2nd <input type="checkbox"/> 3rd <input type="checkbox"/>	

12. PRESENT WORK AREA

Please indicate primary assigned work area and percent of time spent at that site. If at other locations, please indicate and note percent of time for each.

PRIMARY WORK AREA	_____
SPECIFIC JOB	_____

13. APPROPRIATE INDUSTRY

- | | | |
|------------------------------------------------|---------------------------------------------|--------------------------------------------------|
| 1 <input type="checkbox"/> Garnetting | 3 <input type="checkbox"/> Cotton Warehouse | 5 <input type="checkbox"/> Cotton Classification |
| 2 <input type="checkbox"/> Cottonseed Oil Mill | 4 <input type="checkbox"/> Utilization | 6 <input type="checkbox"/> Cotton Ginning |

(Furnishing your Social Security number is voluntary. Your refusal to provide this number will not affect any right, benefit, or privilege to which you would be entitled if you did provide your Social Security number. Your Social Security number is being requested since it will permit use in future determinations in, statistical research studies.)

C. SYMPTOMS

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

COUGH

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

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

If YES to either question 1 or 2:

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

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

If YES:

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

PHLEGM

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

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

If YES to either question 6 or 7:

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

If YES to question 3 or 8:

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

*These words are for subjects who work at night

CHEST ILLNESS

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

For subjects who usually have phlegm:

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

If YES to 11:

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

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

13. Only one such illness with increased phlegm? 1 Yes 2 No

14. More than one such illness: 1 Yes 2 No

Br. Brade _____

TIGHTNESS

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

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

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

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

(ASK ONLY IF NO TO QUESTION 15)

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

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

BREATHLESSNESS

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

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

1 Yes 2 No

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

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

1 Yes 2 No

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

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

1 Yes 2 No

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

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

1 Yes 2 No

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

26.

Dyspnea Grd. _____

ON MONDAYS:

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

1 Yes 2 No

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

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

1 Yes 2 No

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

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

1 Yes 2 No

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

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

1 Yes 2 No

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

31.

B. Grd. _____

OTHER ILLNESSES AND ALLERGY HISTORY

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

1 Yes 2 No

OTHER ILLNESSES AND ALLERGY HISTORY CONTINUED:

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

TOBACCO SMOKING

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

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

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

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

OCCUPATIONAL HISTORY

Have you ever worked in:

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

Type of exposure _____

Length of exposure _____

APPENDIX B III

Abbreviated Respiratory Questionnaire

A. IDENTIFICATION DATA

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

NAME _____ DATE OF INTERVIEW _____
(Surname)

_____ DATE OF BIRTH _____
(First Name) M F

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

_____ RACE W N IND. OTHER (11)

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

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

PRESENT WORK AREA _____ WEIGHT _____ (16,18)

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

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

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

B. COUGH

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

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

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

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

Do you cough on any particular day of the week? Yes No (34)
(1) (2) (3) (4) (5) (6) (7)

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

C. PHLEGM or alternative word to suit local custom.

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

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

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

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

If "Yes" to question (33) or (39):

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

†These words are for subjects who work at night

D. TIGHTNESS

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

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

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

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

(Ask only if NO to Question (45)†

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

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

E. TOBACCO SMOKING*

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

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

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

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

HT	AGE																								
	17	19	21	23	25	27	29	31	33	35															
60.0	3.44	3.59	3.75	3.91	3.72	3.66	3.61	3.55	3.49	3.43	3.37	3.32	3.26	3.20	3.14	3.08	3.03	2.97	2.91	2.85	2.79	2.74	2.68	2.62	2.56
60.5	3.50	3.66	3.81	3.97	3.80	3.75	3.69	3.63	3.57	3.51	3.45	3.40	3.34	3.28	3.22	3.17	3.11	3.05	2.99	2.93	2.88	2.82	2.76	2.70	2.64
61.0	3.56	3.72	3.88	4.03	3.89	3.83	3.77	3.71	3.66	3.60	3.54	3.48	3.42	3.37	3.31	3.25	3.19	3.13	3.08	3.02	2.96	2.90	2.84	2.79	2.73
61.5	3.63	3.79	3.94	4.10	3.97	3.91	3.85	3.80	3.74	3.68	3.62	3.56	3.51	3.45	3.39	3.33	3.27	3.22	3.16	3.10	3.04	2.98	2.93	2.87	2.81
62.0	3.69	3.85	4.00	4.16	4.05	3.99	3.94	3.88	3.82	3.76	3.70	3.65	3.59	3.53	3.47	3.41	3.36	3.30	3.24	3.18	3.12	3.07	3.01	2.95	2.89
62.5	3.76	3.91	4.07	4.22	4.13	4.08	4.02	3.96	3.90	3.84	3.79	3.73	3.67	3.61	3.55	3.50	3.44	3.38	3.32	3.26	3.21	3.15	3.09	3.03	2.97
63.0	3.82	3.97	4.13	4.29	4.22	4.16	4.10	4.04	3.99	3.93	3.87	3.81	3.75	3.70	3.64	3.58	3.52	3.46	3.41	3.35	3.29	3.23	3.17	3.12	3.06
63.5	3.88	4.04	4.19	4.35	4.30	4.24	4.18	4.13	4.07	4.01	3.95	3.89	3.84	3.78	3.72	3.66	3.60	3.55	3.49	3.43	3.37	3.31	3.26	3.20	3.14
64.0	3.95	4.10	4.26	4.41	4.30	4.32	4.27	4.21	4.15	4.09	4.03	3.98	3.92	3.86	3.80	3.74	3.69	3.63	3.57	3.51	3.45	3.40	3.34	3.28	3.22
64.5	4.01	4.17	4.32	4.48	4.46	4.41	4.35	4.29	4.23	4.17	4.12	4.06	4.00	3.94	3.88	3.83	3.77	3.71	3.65	3.59	3.54	3.48	3.42	3.36	3.30
65.0	4.07	4.23	4.39	4.54	4.55	4.49	4.43	4.37	4.32	4.26	4.20	4.14	4.08	4.03	3.97	3.91	3.85	3.79	3.74	3.68	3.62	3.56	3.50	3.45	3.39
65.5	4.14	4.29	4.45	4.60	4.63	4.57	4.51	4.46	4.40	4.34	4.29	4.22	4.17	4.11	4.05	3.99	3.93	3.88	3.82	3.76	3.70	3.64	3.59	3.53	3.47
66.0	4.20	4.36	4.51	4.67	4.71	4.65	4.60	4.54	4.48	4.42	4.36	4.31	4.25	4.19	4.13	4.07	4.02	3.96	3.90	3.84	3.78	3.73	3.67	3.61	3.55
66.5	4.26	4.42	4.58	4.73	4.80	4.74	4.68	4.62	4.56	4.51	4.45	4.39	4.33	4.27	4.22	4.16	4.10	4.04	3.98	3.93	3.87	3.81	3.75	3.69	3.64
67.0	4.33	4.48	4.64	4.80	4.83	4.82	4.76	4.70	4.65	4.59	4.53	4.47	4.41	4.36	4.30	4.24	4.18	4.12	4.07	4.01	3.95	3.89	3.83	3.78	3.72
67.5	4.39	4.55	4.70	4.86	4.96	4.90	4.84	4.79	4.73	4.67	4.61	4.55	4.50	4.44	4.38	4.32	4.26	4.21	4.15	4.09	4.03	3.97	3.92	3.86	3.80
68.0	4.45	4.61	4.77	4.92	5.04	4.98	4.93	4.87	4.81	4.75	4.69	4.64	4.58	4.52	4.46	4.40	4.35	4.29	4.23	4.17	4.11	4.06	4.00	3.94	3.88
68.5	4.52	4.67	4.83	4.99	5.13	5.07	5.01	4.95	4.89	4.84	4.78	4.72	4.66	4.60	4.55	4.49	4.43	4.37	4.31	4.26	4.20	4.14	4.08	4.02	3.97
69.0	4.58	4.74	4.89	5.05	5.21	5.15	5.09	5.03	4.98	4.92	4.86	4.80	4.74	4.69	4.63	4.57	4.51	4.45	4.40	4.34	4.28	4.22	4.16	4.11	4.05
69.5	4.64	4.80	4.96	5.11	5.29	5.23	5.17	5.12	5.06	5.00	4.94	4.88	4.83	4.77	4.71	4.65	4.59	4.54	4.48	4.42	4.36	4.30	4.25	4.19	4.13
70.0	4.71	4.86	5.02	5.18	5.37	5.32	5.26	5.20	5.14	5.08	5.02	4.97	4.91	4.85	4.79	4.74	4.68	4.62	4.56	4.50	4.44	4.39	4.33	4.27	4.21
70.5	4.77	4.93	5.08	5.24	5.46	5.40	5.34	5.28	5.22	5.17	5.11	5.05	4.99	4.93	4.88	4.82	4.76	4.70	4.64	4.59	4.53	4.47	4.41	4.35	4.30
71.0	4.83	4.99	5.15	5.30	5.54	5.48	5.42	5.36	5.31	5.25	5.19	5.13	5.07	5.02	4.96	4.90	4.84	4.78	4.73	4.67	4.61	4.55	4.49	4.44	4.38
71.5	4.90	5.05	5.21	5.37	5.62	5.56	5.50	5.45	5.39	5.33	5.27	5.21	5.16	5.10	5.04	4.98	4.92	4.87	4.81	4.75	4.69	4.64	4.58	4.52	4.46
72.0	4.96	5.12	5.27	5.43	5.70	5.65	5.59	5.53	5.47	5.41	5.36	5.30	5.24	5.18	5.12	5.07	5.01	4.95	4.89	4.83	4.78	4.72	4.66	4.60	4.54
72.5	5.03	5.19	5.34	5.49	5.79	5.73	5.67	5.61	5.55	5.50	5.44	5.38	5.32	5.26	5.21	5.15	5.09	5.03	4.97	4.92	4.86	4.80	4.74	4.68	4.63
73.0	5.09	5.24	5.40	5.56	5.87	5.81	5.75	5.69	5.64	5.58	5.52	5.46	5.40	5.35	5.29	5.23	5.17	5.11	5.06	5.00	4.94	4.88	4.82	4.77	4.71
73.5	5.15	5.31	5.46	5.62	5.95	5.89	5.83	5.78	5.72	5.66	5.60	5.54	5.49	5.43	5.37	5.31	5.25	5.20	5.14	5.08	5.02	4.96	4.91	4.85	4.79
74.0	5.22	5.37	5.53	5.68	6.03	5.98	5.92	5.86	5.80	5.74	5.69	5.63	5.57	5.51	5.45	5.40	5.34	5.28	5.22	5.16	5.11	5.05	4.99	4.93	4.87
74.5	5.28	5.44	5.59	5.75	6.12	6.06	6.00	5.94	5.88	5.83	5.77	5.71	5.65	5.59	5.54	5.48	5.42	5.36	5.30	5.25	5.19	5.13	5.07	5.01	4.96
75.0	5.34	5.50	5.65	5.81	6.20	6.14	6.08	6.02	5.97	5.91	5.85	5.79	5.73	5.68	5.62	5.56	5.50	5.44	5.39	5.33	5.27	5.21	5.15	5.10	5.04
75.5	5.41	5.56	5.72	5.87	6.28	6.22	6.17	6.11	6.05	5.99	5.93	5.88	5.82	5.76	5.70	5.64	5.59	5.53	5.47	5.41	5.35	5.30	5.24	5.18	5.12
76.0	5.47	5.63	5.78	5.94	6.36	6.31	6.25	6.19	6.13	6.07	6.02	5.96	5.90	5.84	5.78	5.73	5.67	5.61	5.55	5.49	5.44	5.38	5.32	5.26	5.20
76.5	5.53	5.69	5.85	6.00	6.45	6.39	6.33	6.27	6.21	6.16	6.10	6.04	5.98	5.92	5.87	5.81	5.75	5.69	5.63	5.58	5.52	5.46	5.40	5.34	5.29
77.0	5.60	5.75	5.91	6.06	6.53	6.47	6.41	6.35	6.30	6.24	6.18	6.12	6.06	6.01	5.95	5.89	5.83	5.77	5.72	5.66	5.60	5.54	5.48	5.43	5.37
77.5	5.66	5.82	5.97	6.13	6.61	6.55	6.50	6.44	6.38	6.32	6.26	6.21	6.15	6.09	6.03	5.97	5.92	5.86	5.80	5.74	5.68	5.63	5.57	5.51	5.45
78.0	5.72	5.88	6.04	6.19	6.69	6.64	6.58	6.52	6.46	6.40	6.35	6.29	6.23	6.17	6.11	6.06	6.00	5.94	5.88	5.82	5.77	5.71	5.65	5.59	5.53
78.5	5.79	5.94	6.10	6.26	6.78	6.72	6.66	6.60	6.54	6.49	6.43	6.37	6.31	6.25	6.20	6.14	6.08	6.02	5.96	5.91	5.85	5.79	5.73	5.67	5.62
79.0	5.85	6.01	6.16	6.32	6.86	6.80	6.74	6.68	6.63	6.57	6.51	6.45	6.39	6.34	6.28	6.22	6.16	6.10	6.05	5.99	5.93	5.87	5.81	5.76	5.70
79.5	5.91	6.07	6.23	6.38	6.94	6.88	6.83	6.77	6.71	6.65	6.59	6.54	6.48	6.42	6.36	6.30	6.24	6.19	6.13	6.07	6.01	5.96	5.90	5.84	5.78
80.0	5.98	6.13	6.29	6.45	7.02	6.97	6.91	6.85	6.79	6.73	6.68	6.62	6.56	6.50	6.44	6.39	6.33	6.27	6.21	6.15	6.10	6.04	5.98	5.92	5.86
80.5	6.04	6.20	6.35	6.51	7.11	7.05	6.99	6.93	6.87	6.82	6.76	6.70	6.64	6.58	6.53	6.47	6.41	6.35	6.29	6.24	6.18	6.12	6.06	6.00	5.95
81.0	6.10	6.26	6.42	6.57	7.19	7.13	7.07	7.02	6.96	6.90	6.84	6.78	6.73	6.67	6.61	6.55	6.49	6.44	6.38	6.32	6.26	6.20	6.15	6.09	6.03
81.5	6.17	6.32	6.48	6.64	7.27	7.21	7.16	7.10	7.04	6.98	6.92	6.87	6.81	6.75	6.69	6.63	6.58	6.52	6.46	6.40	6.34	6.29	6.23	6.17	6.11
82.0	6.23	6.39	6.54	6.70	7.35	7.30	7.24	7.18	7.12	7.06	7.01	6.95	6.89	6.83	6.77	6.72	6.66	6.60	6.54	6.48	6.43	6.37	6.31	6.25	6.19
82.5	6.30	6.45	6.61	6.76	7.44	7.38	7.32	7.26	7.20	7.15	7.09	7.03	6.97	6.91	6.86	6.80	6.74	6.68	6.62	6.57	6.51	6.45	6.39	6.33	6.28
83.0	6.36	6.51	6.67	6.83	7.52	7.46	7.40	7.35	7.29	7.23	7.17	7.11	7.06	7.00	6.94	6.88	6.82	6.77	6.71	6.65	6.59	6.53	6.48	6.42	6.36
83.5	6.42	6.58	6.73	6.89	7.60	7.54	7.49	7.43	7.37	7.31	7.25	7.20	7.14	7.08	7.02	6.96	6.91	6.85	6.79	6.73	6.67	6.62	6.56	6.50	6.44
84.0	6.49	6.64	6.80	6.95	7.68	7.63	7.57	7.51	7.45	7.39	7.34	7.28	7.22	7.16	7.10	7.05	6.99	6.93	6.87	6.81	6.76	6.70	6.64	6.58	6.52
84.5	6.55	6.71	6.86	7.02	7.77	7.71	7.65	7.59	7.53	7.48	7.42	7.36	7.30	7.24	7.19	7.13	7.07	7.01	6.95	6.90	6.84	6.78	6.72	6.66	6.61
85.0	6.61	6.77	6.92	7.08	7.85	7.79	7.73																		

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

HT	AGE																								
	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65
60.0	2.97	3.06	3.15	3.24	3.05	2.99	2.94	2.88	2.83	2.78	2.72	2.67	2.61	2.56	2.51	2.45	2.40	2.34	2.29	2.24	2.18	2.13	2.07	2.02	1.97
60.5	3.03	3.12	3.21	3.30	3.11	3.06	3.00	2.95	2.90	2.84	2.79	2.73	2.68	2.63	2.57	2.52	2.46	2.41	2.36	2.30	2.25	2.19	2.14	2.09	2.03
61.0	3.08	3.17	3.26	3.35	3.18	3.12	3.07	3.02	2.96	2.91	2.85	2.80	2.75	2.69	2.64	2.58	2.53	2.48	2.42	2.37	2.31	2.26	2.21	2.15	2.10
61.5	3.14	3.23	3.32	3.41	3.24	3.19	3.14	3.08	3.03	2.97	2.92	2.87	2.81	2.76	2.70	2.65	2.60	2.54	2.49	2.43	2.38	2.33	2.27	2.22	2.16
62.0	3.20	3.29	3.38	3.47	3.31	3.26	3.20	3.15	3.09	3.04	2.99	2.93	2.88	2.82	2.77	2.72	2.66	2.61	2.55	2.50	2.45	2.39	2.34	2.28	2.23
62.5	3.26	3.35	3.44	3.53	3.38	3.32	3.27	3.22	3.16	3.11	3.05	3.00	2.95	2.89	2.84	2.78	2.73	2.68	2.62	2.57	2.51	2.46	2.41	2.35	2.30
63.0	3.32	3.41	3.50	3.59	3.44	3.39	3.34	3.28	3.23	3.17	3.12	3.07	3.01	2.96	2.90	2.85	2.80	2.74	2.69	2.63	2.58	2.53	2.47	2.42	2.36
63.5	3.38	3.47	3.56	3.65	3.51	3.46	3.40	3.35	3.29	3.24	3.19	3.13	3.08	3.02	2.97	2.92	2.86	2.81	2.75	2.70	2.65	2.59	2.54	2.48	2.43
64.0	3.43	3.52	3.61	3.70	3.58	3.52	3.47	3.41	3.36	3.31	3.25	3.20	3.14	3.09	3.04	2.98	2.93	2.87	2.82	2.77	2.71	2.66	2.60	2.55	2.50
64.5	3.49	3.58	3.67	3.76	3.64	3.59	3.53	3.48	3.43	3.37	3.32	3.26	3.21	3.16	3.10	3.05	2.99	2.94	2.89	2.83	2.78	2.72	2.67	2.62	2.56
65.0	3.55	3.64	3.73	3.82	3.71	3.65	3.60	3.55	3.49	3.44	3.38	3.33	3.28	3.22	3.17	3.11	3.06	3.01	2.95	2.90	2.84	2.79	2.74	2.68	2.63
65.5	3.61	3.70	3.79	3.88	3.77	3.72	3.67	3.61	3.56	3.50	3.45	3.40	3.34	3.29	3.23	3.18	3.13	3.07	3.02	2.96	2.91	2.86	2.80	2.75	2.69
66.0	3.67	3.76	3.85	3.94	3.84	3.79	3.73	3.68	3.62	3.57	3.52	3.46	3.41	3.35	3.30	3.25	3.19	3.14	3.08	3.03	2.98	2.92	2.87	2.81	2.76
66.5	3.73	3.82	3.91	4.00	3.91	3.85	3.80	3.74	3.69	3.64	3.58	3.53	3.47	3.42	3.37	3.31	3.26	3.20	3.15	3.10	3.04	2.99	2.93	2.88	2.83
67.0	3.79	3.88	3.97	4.06	3.97	3.92	3.86	3.81	3.76	3.70	3.65	3.59	3.54	3.49	3.43	3.38	3.32	3.27	3.22	3.16	3.11	3.05	3.00	2.95	2.89
67.5	3.84	3.93	4.02	4.11	4.04	3.98	3.93	3.88	3.82	3.77	3.71	3.66	3.61	3.55	3.50	3.44	3.39	3.34	3.28	3.23	3.17	3.12	3.07	3.01	2.96
68.0	3.90	3.99	4.08	4.17	4.10	4.05	4.00	3.94	3.89	3.83	3.78	3.73	3.67	3.62	3.56	3.51	3.46	3.40	3.35	3.29	3.24	3.19	3.13	3.08	3.02
68.5	3.96	4.05	4.14	4.23	4.17	4.12	4.06	4.01	3.95	3.90	3.85	3.79	3.74	3.68	3.63	3.58	3.52	3.47	3.41	3.36	3.31	3.25	3.20	3.14	3.09
69.0	4.02	4.11	4.20	4.29	4.24	4.18	4.13	4.07	4.02	3.97	3.91	3.86	3.80	3.75	3.70	3.64	3.59	3.53	3.48	3.43	3.37	3.32	3.26	3.21	3.16
69.5	4.08	4.17	4.26	4.35	4.30	4.25	4.19	4.14	4.09	4.03	3.98	3.92	3.87	3.82	3.76	3.71	3.65	3.60	3.55	3.49	3.44	3.38	3.33	3.28	3.22
70.0	4.14	4.23	4.32	4.41	4.37	4.31	4.26	4.21	4.15	4.10	4.04	3.99	3.94	3.88	3.83	3.77	3.72	3.67	3.61	3.56	3.50	3.45	3.40	3.34	3.29
70.5	4.19	4.28	4.37	4.46	4.43	4.38	4.33	4.27	4.22	4.16	4.11	4.06	4.00	3.95	3.89	3.84	3.79	3.73	3.68	3.62	3.57	3.52	3.46	3.41	3.35
71.0	4.25	4.34	4.43	4.52	4.50	4.45	4.39	4.34	4.28	4.23	4.18	4.12	4.07	4.01	3.96	3.91	3.85	3.80	3.74	3.69	3.64	3.58	3.53	3.47	3.42
71.5	4.31	4.40	4.49	4.58	4.57	4.51	4.46	4.40	4.35	4.30	4.24	4.19	4.13	4.08	4.03	3.97	3.92	3.86	3.81	3.76	3.70	3.65	3.59	3.54	3.49
72.0	4.37	4.46	4.55	4.64	4.63	4.58	4.52	4.47	4.42	4.36	4.31	4.25	4.20	4.15	4.09	4.04	3.98	3.93	3.88	3.82	3.77	3.71	3.66	3.61	3.55
72.5	4.43	4.52	4.61	4.70	4.70	4.64	4.59	4.54	4.48	4.43	4.37	4.32	4.27	4.21	4.16	4.10	4.05	4.00	3.94	3.89	3.83	3.78	3.73	3.67	3.62
73.0	4.49	4.58	4.67	4.76	4.76	4.71	4.66	4.60	4.55	4.49	4.44	4.39	4.33	4.28	4.22	4.17	4.12	4.06	4.01	3.95	3.90	3.85	3.79	3.74	3.68
73.5	4.54	4.63	4.72	4.81	4.83	4.78	4.72	4.67	4.61	4.56	4.51	4.45	4.40	4.34	4.29	4.24	4.18	4.13	4.07	4.02	3.97	3.91	3.86	3.80	3.75
74.0	4.60	4.69	4.78	4.87	4.90	4.84	4.79	4.73	4.68	4.63	4.57	4.52	4.46	4.41	4.36	4.30	4.25	4.19	4.14	4.09	4.03	3.98	3.92	3.87	3.82
74.5	4.66	4.75	4.84	4.93	4.96	4.91	4.85	4.80	4.75	4.69	4.64	4.58	4.53	4.48	4.42	4.37	4.31	4.26	4.21	4.15	4.10	4.04	3.99	3.94	3.88
75.0	4.72	4.81	4.90	4.99	5.03	4.97	4.92	4.87	4.81	4.76	4.70	4.65	4.60	4.54	4.49	4.43	4.38	4.33	4.27	4.22	4.16	4.11	4.06	4.00	3.95
75.5	4.78	4.87	4.96	5.05	5.09	5.04	4.99	4.93	4.88	4.82	4.77	4.72	4.66	4.61	4.55	4.50	4.45	4.39	4.34	4.28	4.23	4.18	4.12	4.07	4.01
76.0	4.84	4.93	5.02	5.11	5.16	5.11	5.05	5.00	4.94	4.89	4.84	4.78	4.73	4.67	4.62	4.57	4.51	4.46	4.40	4.35	4.30	4.24	4.19	4.13	4.08
76.5	4.90	4.99	5.08	5.17	5.23	5.17	5.12	5.06	5.01	4.96	4.90	4.85	4.79	4.74	4.69	4.63	4.58	4.52	4.47	4.42	4.36	4.31	4.25	4.20	4.15
77.0	4.95	5.04	5.13	5.22	5.29	5.24	5.18	5.13	5.08	5.02	4.97	4.91	4.86	4.81	4.75	4.70	4.64	4.59	4.54	4.48	4.43	4.37	4.32	4.27	4.21
77.5	5.01	5.10	5.19	5.28	5.36	5.30	5.25	5.20	5.14	5.09	5.03	4.98	4.93	4.87	4.82	4.76	4.71	4.66	4.60	4.55	4.49	4.44	4.39	4.33	4.28
78.0	5.07	5.16	5.25	5.34	5.42	5.37	5.32	5.26	5.21	5.15	5.10	5.05	4.99	4.94	4.88	4.83	4.78	4.72	4.67	4.61	4.56	4.51	4.45	4.40	4.34
78.5	5.13	5.22	5.31	5.40	5.49	5.44	5.38	5.33	5.27	5.22	5.17	5.11	5.06	5.00	4.95	4.90	4.84	4.79	4.73	4.68	4.63	4.57	4.52	4.46	4.41
79.0	5.19	5.28	5.37	5.46	5.56	5.50	5.45	5.39	5.34	5.29	5.23	5.18	5.12	5.07	5.02	4.96	4.91	4.85	4.80	4.75	4.69	4.64	4.58	4.53	4.48
79.5	5.25	5.34	5.43	5.52	5.62	5.57	5.51	5.46	5.41	5.35	5.30	5.24	5.19	5.14	5.08	5.03	4.97	4.92	4.87	4.81	4.76	4.70	4.65	4.60	4.54
80.0	5.30	5.39	5.48	5.57	5.69	5.63	5.58	5.53	5.47	5.42	5.36	5.31	5.26	5.20	5.15	5.09	5.04	4.99	4.93	4.88	4.82	4.77	4.72	4.66	4.61
80.5	5.36	5.45	5.54	5.63	5.75	5.70	5.65	5.59	5.54	5.48	5.43	5.38	5.32	5.27	5.21	5.16	5.11	5.05	5.00	4.94	4.89	4.84	4.78	4.73	4.67
81.0	5.42	5.51	5.60	5.69	5.82	5.77	5.71	5.66	5.60	5.55	5.50	5.44	5.39	5.33	5.28	5.23	5.17	5.12	5.06	5.01	4.96	4.90	4.85	4.79	4.74
81.5	5.48	5.57	5.66	5.75	5.89	5.83	5.78	5.72	5.67	5.62	5.56	5.51	5.45	5.40	5.35	5.29	5.24	5.18	5.13	5.08	5.02	4.97	4.91	4.86	4.81
82.0	5.54	5.63	5.72	5.81	5.95	5.90	5.84	5.79	5.74	5.68	5.63	5.57	5.52	5.47	5.41	5.36	5.30	5.25	5.20	5.14	5.09	5.03	4.98	4.93	4.87
82.5	5.60	5.69	5.78	5.87	6.02	5.96	5.91	5.86	5.80	5.75	5.69	5.64	5.59	5.53	5.48	5.42	5.37	5.32	5.26	5.21	5.15	5.10	5.05	4.99	4.94
83.0	5.65	5.74	5.83	5.92	6.08	6.03	5.98	5.92	5.87	5.81	5.76	5.71	5.65	5.60	5.54	5.49	5.44	5.38	5.33	5.27	5.22	5.17	5.11	5.06	5.00
83.5	5.71	5.80	5.89	5.98	6.15	6.10	6.04	5.99	5.93	5.88	5.83	5.77	5.72	5.66	5.61	5.56	5.50	5.45	5.39	5.34	5.29	5.23	5.18	5.12	5.07
84.0	5.77	5.86	5.95	6.04	6.22	6.16	6.11	6.05	6.00	5.95	5.89	5.84	5.78	5.73	5.68	5.62	5.57	5.51	5.46	5.41	5.35	5.30	5.24	5.19	5.14
84.5	5.83	5.92	6.01	6.10	6.28	6.23	6.17	6.12	6.07	6.01	5.96	5.90	5.85	5.80	5.74	5.69	5.63	5.58	5.53	5.47	5.42	5.36	5.31	5.26	5.20
85.0	5.89	5.98	6.																						

TABLE 3. PREDICTED FVC FOR FEMALES (HUDSON, ET AL; AM REV RESPIR DIS, 1976, 113, 587.)

HT	AGE																								
	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65
82.0	2.45	2.64	2.65	2.61	2.56	2.52	2.47	2.43	2.39	2.34	2.30	2.25	2.21	2.17	2.12	2.08	2.03	1.99	1.95	1.90	1.86	1.81	1.77	1.73	1.68
82.5	2.50	2.68	2.70	2.65	2.61	2.57	2.52	2.48	2.43	2.39	2.35	2.30	2.26	2.21	2.17	2.13	2.08	2.04	1.99	1.95	1.91	1.86	1.82	1.77	1.73
83.0	2.54	2.72	2.74	2.70	2.66	2.61	2.57	2.52	2.48	2.44	2.39	2.35	2.30	2.26	2.22	2.17	2.13	2.08	2.04	2.00	1.95	1.91	1.86	1.82	1.78
83.5	2.50	2.76	2.79	2.75	2.70	2.66	2.62	2.57	2.53	2.48	2.44	2.40	2.35	2.31	2.26	2.22	2.18	2.13	2.09	2.04	2.00	1.96	1.91	1.87	1.82
84.0	2.62	2.81	2.84	2.79	2.75	2.71	2.66	2.62	2.57	2.53	2.49	2.44	2.40	2.35	2.31	2.27	2.22	2.18	2.13	2.09	2.05	2.00	1.96	1.91	1.87
84.5	2.66	2.85	2.89	2.84	2.80	2.75	2.71	2.67	2.62	2.58	2.53	2.49	2.45	2.40	2.36	2.31	2.27	2.23	2.18	2.14	2.09	2.05	2.01	1.96	1.92
85.0	2.71	2.89	2.93	2.89	2.84	2.80	2.76	2.71	2.67	2.62	2.58	2.54	2.49	2.45	2.40	2.36	2.32	2.27	2.23	2.18	2.14	2.10	2.05	2.01	1.96
85.5	2.75	2.93	2.98	2.94	2.89	2.85	2.80	2.76	2.72	2.67	2.63	2.58	2.54	2.50	2.45	2.41	2.36	2.32	2.28	2.23	2.19	2.14	2.10	2.06	2.01
86.0	2.79	2.97	3.03	2.98	2.94	2.89	2.85	2.81	2.76	2.72	2.67	2.63	2.59	2.54	2.50	2.45	2.41	2.37	2.32	2.28	2.23	2.19	2.15	2.10	2.06
86.5	2.83	3.01	3.07	3.03	2.99	2.94	2.90	2.85	2.81	2.77	2.72	2.68	2.63	2.59	2.55	2.50	2.46	2.41	2.37	2.33	2.28	2.24	2.19	2.15	2.11
87.0	2.87	3.06	3.12	3.08	3.03	2.99	2.94	2.90	2.86	2.81	2.77	2.72	2.68	2.64	2.59	2.55	2.50	2.46	2.42	2.37	2.33	2.28	2.24	2.20	2.15
87.5	2.91	3.10	3.17	3.12	3.08	3.04	2.99	2.95	2.90	2.86	2.82	2.77	2.73	2.68	2.64	2.60	2.55	2.51	2.46	2.42	2.38	2.33	2.29	2.24	2.20
88.0	2.96	3.14	3.21	3.17	3.13	3.08	3.04	2.99	2.95	2.91	2.86	2.82	2.77	2.73	2.69	2.64	2.60	2.55	2.51	2.47	2.42	2.38	2.33	2.29	2.25
88.5	3.00	3.18	3.26	3.22	3.17	3.13	3.09	3.04	3.00	2.95	2.91	2.87	2.82	2.78	2.73	2.69	2.65	2.60	2.56	2.51	2.47	2.43	2.38	2.34	2.29
89.0	3.04	3.22	3.31	3.26	3.22	3.18	3.13	3.09	3.04	3.00	2.96	2.91	2.87	2.82	2.78	2.74	2.69	2.65	2.60	2.56	2.52	2.47	2.43	2.38	2.34
89.5	3.08	3.27	3.36	3.31	3.27	3.23	3.18	3.14	3.09	3.05	3.00	2.96	2.92	2.87	2.83	2.78	2.74	2.70	2.65	2.61	2.56	2.52	2.48	2.43	2.39
90.0	3.12	3.31	3.40	3.36	3.31	3.27	3.23	3.18	3.14	3.09	3.05	3.01	2.96	2.92	2.87	2.83	2.79	2.74	2.70	2.65	2.61	2.57	2.52	2.48	2.43
90.5	3.17	3.35	3.45	3.41	3.36	3.32	3.27	3.23	3.19	3.14	3.10	3.05	3.01	2.97	2.92	2.88	2.83	2.79	2.75	2.70	2.66	2.61	2.57	2.53	2.49
91.0	3.21	3.39	3.50	3.45	3.41	3.36	3.32	3.28	3.23	3.19	3.14	3.10	3.06	3.01	2.97	2.92	2.88	2.84	2.79	2.75	2.70	2.66	2.62	2.57	2.53
91.5	3.25	3.43	3.54	3.50	3.46	3.41	3.37	3.32	3.28	3.24	3.19	3.15	3.10	3.06	3.02	2.97	2.93	2.88	2.84	2.80	2.75	2.71	2.66	2.62	2.58
92.0	3.29	3.48	3.59	3.55	3.50	3.46	3.41	3.37	3.33	3.28	3.24	3.19	3.15	3.11	3.06	3.02	2.97	2.93	2.89	2.84	2.80	2.75	2.71	2.67	2.62
92.5	3.33	3.52	3.64	3.59	3.55	3.51	3.46	3.42	3.37	3.33	3.29	3.24	3.20	3.15	3.11	3.07	3.02	2.98	2.93	2.89	2.85	2.80	2.76	2.71	2.67
93.0	3.38	3.56	3.68	3.64	3.60	3.55	3.51	3.46	3.42	3.38	3.33	3.29	3.24	3.20	3.16	3.11	3.07	3.02	2.98	2.94	2.89	2.85	2.80	2.76	2.72
93.5	3.42	3.60	3.73	3.69	3.64	3.60	3.56	3.51	3.47	3.42	3.38	3.34	3.29	3.25	3.20	3.16	3.12	3.07	3.03	2.98	2.94	2.90	2.85	2.81	2.76
94.0	3.46	3.64	3.78	3.73	3.69	3.65	3.60	3.56	3.51	3.47	3.43	3.38	3.34	3.29	3.25	3.21	3.16	3.12	3.07	3.03	2.99	2.94	2.90	2.85	2.81
94.5	3.50	3.69	3.83	3.78	3.74	3.69	3.65	3.61	3.56	3.52	3.47	3.43	3.39	3.34	3.30	3.25	3.21	3.17	3.12	3.08	3.03	2.99	2.95	2.90	2.86
95.0	3.54	3.73	3.87	3.83	3.78	3.74	3.70	3.65	3.61	3.56	3.52	3.48	3.43	3.39	3.34	3.30	3.26	3.21	3.17	3.12	3.08	3.04	2.99	2.95	2.90
95.5	3.59	3.77	3.92	3.88	3.83	3.79	3.74	3.70	3.66	3.61	3.57	3.52	3.48	3.44	3.39	3.35	3.30	3.26	3.22	3.17	3.13	3.08	3.04	3.00	2.95
96.0	3.63	3.81	3.97	3.92	3.88	3.83	3.79	3.75	3.70	3.66	3.61	3.57	3.53	3.48	3.44	3.39	3.35	3.31	3.26	3.22	3.17	3.13	3.09	3.04	3.00
96.5	3.67	3.85	4.01	3.97	3.93	3.88	3.84	3.79	3.75	3.71	3.66	3.62	3.57	3.53	3.49	3.44	3.40	3.35	3.31	3.27	3.22	3.18	3.13	3.09	3.05
97.0	3.71	3.89	4.06	4.02	3.97	3.93	3.88	3.84	3.80	3.75	3.71	3.66	3.62	3.58	3.53	3.49	3.44	3.40	3.36	3.31	3.27	3.22	3.18	3.14	3.09
97.5	3.75	3.94	4.11	4.06	4.02	3.98	3.93	3.89	3.84	3.80	3.76	3.71	3.67	3.62	3.58	3.54	3.49	3.45	3.40	3.36	3.32	3.27	3.23	3.18	3.14
98.0	3.79	3.98	4.15	4.11	4.07	4.02	3.98	3.93	3.89	3.85	3.80	3.76	3.71	3.67	3.63	3.58	3.54	3.49	3.45	3.41	3.36	3.32	3.27	3.23	3.19
98.5	3.84	4.02	4.20	4.16	4.11	4.07	4.03	3.98	3.94	3.89	3.85	3.81	3.76	3.72	3.67	3.63	3.59	3.54	3.50	3.45	3.41	3.37	3.32	3.28	3.23
99.0	3.88	4.06	4.25	4.20	4.16	4.12	4.07	4.03	3.98	3.94	3.90	3.85	3.81	3.76	3.72	3.68	3.63	3.59	3.54	3.50	3.46	3.41	3.37	3.32	3.28
99.5	3.92	4.10	4.30	4.25	4.21	4.16	4.12	4.08	4.03	3.99	3.94	3.90	3.86	3.81	3.77	3.72	3.68	3.64	3.59	3.55	3.50	3.46	3.42	3.37	3.33
100.0	3.96	4.15	4.34	4.30	4.25	4.21	4.17	4.12	4.08	4.03	3.99	3.95	3.90	3.86	3.81	3.77	3.73	3.68	3.64	3.59	3.55	3.51	3.46	3.42	3.37
100.5	4.00	4.19	4.39	4.35	4.30	4.26	4.21	4.17	4.13	4.08	4.04	3.99	3.95	3.91	3.86	3.82	3.77	3.73	3.69	3.64	3.60	3.55	3.51	3.47	3.42
101.0	4.05	4.23	4.44	4.39	4.35	4.30	4.26	4.22	4.17	4.13	4.08	4.04	4.00	3.95	3.91	3.86	3.82	3.78	3.73	3.69	3.64	3.60	3.56	3.51	3.47
101.5	4.09	4.27	4.48	4.44	4.40	4.35	4.31	4.26	4.22	4.18	4.13	4.09	4.04	4.00	3.96	3.91	3.87	3.82	3.78	3.74	3.69	3.65	3.60	3.56	3.52
102.0	4.13	4.31	4.53	4.49	4.44	4.40	4.35	4.31	4.27	4.22	4.18	4.13	4.09	4.05	4.00	3.96	3.91	3.87	3.83	3.78	3.74	3.69	3.65	3.61	3.56
102.5	4.17	4.36	4.58	4.53	4.49	4.45	4.40	4.36	4.31	4.27	4.23	4.18	4.14	4.09	4.05	4.01	3.96	3.92	3.87	3.83	3.79	3.74	3.70	3.65	3.61
103.0	4.21	4.40	4.62	4.58	4.54	4.49	4.45	4.40	4.36	4.32	4.27	4.23	4.18	4.14	4.10	4.05	4.01	3.96	3.92	3.88	3.83	3.79	3.74	3.70	3.66
103.5	4.26	4.44	4.67	4.63	4.58	4.54	4.50	4.45	4.41	4.36	4.32	4.28	4.23	4.19	4.14	4.10	4.06	4.01	3.97	3.92	3.88	3.84	3.79	3.75	3.70
104.0	4.30	4.48	4.72	4.67	4.63	4.59	4.54	4.50	4.45	4.41	4.37	4.32	4.28	4.23	4.19	4.15	4.10	4.06	4.01	3.97	3.93	3.88	3.84	3.79	3.75
104.5	4.34	4.52	4.77	4.72	4.68	4.63	4.59	4.55	4.50	4.46	4.41	4.37	4.33	4.28	4.24	4.19	4.15	4.11	4.06	4.02	3.97	3.93	3.89	3.84	3.80
105.0	4.38	4.57	4.81	4.77	4.72	4.68	4.64	4.59	4.55	4.50	4.46	4.42	4.37	4.33	4.28	4.24	4.20	4.15	4.11	4.06	4.02	3.98	3.93	3.89	3.84
105.5	4.42	4.61	4.86	4.82	4.77	4.73	4.68	4.64	4.60	4.55	4.51	4.46	4.42	4.38	4.33	4.29	4.24	4.20	4.16	4.11	4.07	4.02	3.98	3.94	3.89
106.0	4.47	4.65	4.91	4.86	4.82	4.77	4.73	4.69	4.64	4.60	4.55	4.51	4.47	4.42	4.38	4.33	4.29	4.25	4.20	4.16	4.11	4.07	4.03	3.98	3.94
106.5	4.51	4.69	4.95	4.91	4.87	4.82	4.78	4.73	4.69	4.65	4.60	4.56	4.51	4.47	4.43	4.38	4.34	4.29	4.25	4.21	4.16	4.12	4.07	4.03	3.99
107.0	4.55																								

TABLE 4. PREDICTED FEV1 FOR FEMALES (KHUDBSON, ET AL: AM REV RESPIR DIS. 1976. 113. 587.)

HT	AGR										AGE																	
	17	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	61	63	65			
52.0	2.31	2.40	2.33	2.29	2.25	2.21	2.16	2.12	2.00	2.04	2.00	1.95	1.91	1.87	1.83	1.79	1.74	1.70	1.66	1.62	1.58	1.53	1.49	1.45	1.41			
52.5	2.34	2.51	2.37	2.32	2.28	2.24	2.20	2.16	2.11	2.07	2.03	1.99	1.95	1.90	1.86	1.82	1.78	1.74	1.69	1.65	1.61	1.57	1.53	1.48	1.44			
53.0	2.38	2.55	2.40	2.36	2.32	2.27	2.23	2.19	2.15	2.11	2.06	2.02	1.98	1.94	1.90	1.85	1.81	1.77	1.73	1.69	1.64	1.60	1.56	1.52	1.48			
53.5	2.41	2.58	2.43	2.39	2.35	2.31	2.27	2.22	2.18	2.14	2.10	2.06	2.01	1.97	1.93	1.89	1.85	1.80	1.76	1.72	1.68	1.64	1.59	1.55	1.51			
54.0	2.45	2.62	2.47	2.43	2.38	2.34	2.30	2.26	2.22	2.17	2.13	2.09	2.05	2.01	1.96	1.92	1.88	1.84	1.80	1.75	1.71	1.67	1.63	1.59	1.54			
54.5	2.48	2.65	2.50	2.46	2.42	2.38	2.33	2.29	2.25	2.21	2.17	2.12	2.08	2.04	2.00	1.96	1.91	1.87	1.83	1.79	1.75	1.70	1.66	1.62	1.58			
55.0	2.51	2.68	2.54	2.49	2.45	2.41	2.37	2.33	2.28	2.24	2.20	2.16	2.12	2.07	2.03	1.99	1.95	1.91	1.86	1.82	1.78	1.74	1.70	1.65	1.61			
55.5	2.55	2.72	2.57	2.53	2.49	2.45	2.40	2.36	2.32	2.28	2.24	2.19	2.15	2.11	2.07	2.03	1.98	1.94	1.90	1.86	1.82	1.77	1.73	1.69	1.65			
56.0	2.58	2.75	2.61	2.56	2.52	2.48	2.44	2.40	2.35	2.31	2.27	2.23	2.19	2.14	2.10	2.06	2.02	1.98	1.93	1.89	1.85	1.81	1.77	1.72	1.68			
56.5	2.62	2.79	2.64	2.60	2.56	2.51	2.47	2.43	2.39	2.35	2.30	2.26	2.22	2.18	2.14	2.09	2.05	2.01	1.97	1.93	1.88	1.84	1.80	1.76	1.72			
57.0	2.65	2.82	2.67	2.63	2.59	2.55	2.51	2.46	2.42	2.38	2.34	2.30	2.25	2.21	2.17	2.13	2.09	2.04	2.00	1.96	1.92	1.88	1.83	1.79	1.75			
57.5	2.69	2.86	2.71	2.67	2.62	2.58	2.54	2.50	2.46	2.41	2.37	2.33	2.29	2.25	2.20	2.16	2.12	2.08	2.04	1.99	1.95	1.91	1.87	1.83	1.78			
58.0	2.72	2.89	2.74	2.70	2.66	2.62	2.57	2.53	2.49	2.45	2.41	2.36	2.32	2.28	2.24	2.20	2.15	2.11	2.07	2.03	1.99	1.94	1.90	1.86	1.82			
58.5	2.75	2.92	2.78	2.73	2.69	2.65	2.61	2.57	2.52	2.48	2.44	2.40	2.36	2.31	2.27	2.23	2.19	2.15	2.10	2.06	2.02	1.98	1.94	1.89	1.85			
59.0	2.79	2.96	2.81	2.77	2.73	2.69	2.64	2.60	2.56	2.52	2.48	2.43	2.39	2.35	2.31	2.27	2.22	2.18	2.14	2.10	2.06	2.01	1.97	1.93	1.89			
59.5	2.82	2.99	2.85	2.80	2.76	2.72	2.68	2.64	2.59	2.55	2.51	2.47	2.43	2.38	2.34	2.30	2.26	2.22	2.17	2.13	2.09	2.05	2.01	1.96	1.92			
60.0	2.86	3.03	2.88	2.84	2.80	2.75	2.71	2.67	2.63	2.59	2.54	2.50	2.46	2.42	2.38	2.33	2.29	2.25	2.21	2.17	2.12	2.08	2.04	2.00	1.96			
60.5	2.89	3.06	2.91	2.87	2.83	2.79	2.75	2.70	2.66	2.62	2.58	2.54	2.49	2.45	2.41	2.37	2.33	2.28	2.24	2.20	2.16	2.12	2.07	2.03	1.99			
61.0	2.93	3.10	2.95	2.91	2.86	2.82	2.78	2.74	2.70	2.65	2.61	2.57	2.53	2.49	2.44	2.40	2.36	2.32	2.28	2.23	2.19	2.15	2.11	2.07	2.02			
61.5	2.96	3.13	2.98	2.94	2.90	2.86	2.81	2.77	2.73	2.69	2.65	2.60	2.56	2.52	2.48	2.44	2.39	2.35	2.31	2.27	2.23	2.18	2.14	2.10	2.06			
62.0	2.99	3.16	3.02	2.97	2.93	2.89	2.85	2.81	2.76	2.72	2.68	2.64	2.60	2.55	2.51	2.47	2.43	2.39	2.34	2.30	2.26	2.22	2.18	2.13	2.09			
62.5	3.03	3.20	3.05	3.01	2.97	2.93	2.88	2.84	2.80	2.76	2.72	2.67	2.63	2.59	2.55	2.51	2.46	2.42	2.38	2.34	2.30	2.25	2.21	2.17	2.13			
63.0	3.06	3.23	3.09	3.04	3.00	2.96	2.92	2.88	2.83	2.79	2.75	2.71	2.67	2.62	2.58	2.54	2.50	2.46	2.41	2.37	2.33	2.29	2.25	2.20	2.16			
63.5	3.10	3.27	3.12	3.08	3.04	2.99	2.95	2.91	2.87	2.83	2.78	2.74	2.70	2.66	2.62	2.57	2.53	2.49	2.45	2.41	2.36	2.32	2.28	2.24	2.20			
64.0	3.13	3.30	3.15	3.11	3.07	3.03	2.99	2.94	2.90	2.86	2.82	2.78	2.73	2.69	2.65	2.61	2.57	2.52	2.48	2.44	2.40	2.36	2.31	2.27	2.23			
64.5	3.17	3.34	3.19	3.15	3.10	3.06	3.02	2.98	2.94	2.89	2.85	2.81	2.77	2.73	2.68	2.64	2.60	2.56	2.52	2.47	2.43	2.39	2.35	2.31	2.26			
65.0	3.20	3.37	3.22	3.18	3.14	3.10	3.05	3.01	2.97	2.93	2.89	2.84	2.80	2.76	2.72	2.68	2.63	2.59	2.55	2.51	2.47	2.42	2.38	2.34	2.30			
65.5	3.23	3.40	3.26	3.21	3.17	3.13	3.09	3.05	3.00	2.96	2.92	2.88	2.84	2.79	2.75	2.71	2.67	2.63	2.58	2.54	2.50	2.46	2.42	2.37	2.33			
66.0	3.27	3.44	3.29	3.25	3.21	3.17	3.12	3.08	3.04	3.00	2.95	2.91	2.87	2.83	2.79	2.75	2.70	2.66	2.62	2.58	2.54	2.49	2.45	2.41	2.37			
66.5	3.30	3.47	3.33	3.28	3.24	3.20	3.16	3.12	3.07	3.03	2.99	2.95	2.91	2.86	2.82	2.78	2.74	2.70	2.65	2.61	2.57	2.53	2.49	2.44	2.40			
67.0	3.34	3.51	3.36	3.32	3.28	3.23	3.19	3.15	3.11	3.07	3.02	2.98	2.94	2.90	2.86	2.81	2.77	2.73	2.69	2.63	2.60	2.56	2.52	2.48	2.44			
67.5	3.37	3.54	3.39	3.35	3.31	3.27	3.23	3.18	3.14	3.10	3.06	3.02	2.97	2.93	2.89	2.85	2.81	2.76	2.72	2.66	2.64	2.60	2.55	2.51	2.47			
68.0	3.41	3.58	3.43	3.39	3.34	3.30	3.26	3.22	3.18	3.13	3.09	3.05	3.01	2.97	2.92	2.88	2.84	2.80	2.76	2.71	2.67	2.63	2.59	2.55	2.50			
68.5	3.44	3.61	3.46	3.42	3.38	3.34	3.29	3.25	3.21	3.17	3.13	3.08	3.04	3.00	2.96	2.92	2.87	2.83	2.79	2.75	2.71	2.66	2.62	2.58	2.54			
69.0	3.47	3.64	3.50	3.46	3.41	3.37	3.33	3.29	3.25	3.20	3.16	3.12	3.08	3.04	2.99	2.95	2.91	2.87	2.83	2.78	2.74	2.70	2.66	2.62	2.57			
69.5	3.51	3.68	3.53	3.49	3.45	3.41	3.36	3.32	3.28	3.24	3.20	3.15	3.11	3.07	3.03	2.99	2.94	2.90	2.86	2.82	2.78	2.73	2.69	2.65	2.61			
70.0	3.54	3.71	3.57	3.52	3.48	3.44	3.40	3.36	3.31	3.27	3.23	3.19	3.15	3.10	3.06	3.02	2.98	2.94	2.89	2.85	2.81	2.77	2.73	2.68	2.64			
70.5	3.58	3.75	3.60	3.56	3.52	3.47	3.43	3.39	3.35	3.31	3.26	3.22	3.18	3.14	3.10	3.05	3.01	2.97	2.93	2.89	2.84	2.80	2.76	2.72	2.68			
71.0	3.61	3.78	3.63	3.59	3.55	3.51	3.47	3.42	3.38	3.34	3.30	3.26	3.21	3.17	3.13	3.09	3.05	3.00	2.96	2.92	2.88	2.84	2.79	2.75	2.71			
71.5	3.65	3.82	3.67	3.63	3.58	3.54	3.50	3.46	3.42	3.37	3.33	3.29	3.25	3.21	3.16	3.12	3.08	3.04	3.00	2.95	2.91	2.87	2.83	2.79	2.74			
72.0	3.68	3.85	3.70	3.66	3.62	3.58	3.53	3.49	3.45	3.41	3.37	3.32	3.28	3.24	3.20	3.16	3.11	3.07	3.03	2.99	2.95	2.90	2.86	2.82	2.78			
72.5	3.71	3.88	3.74	3.70	3.65	3.61	3.57	3.53	3.49	3.44	3.40	3.36	3.32	3.28	3.23	3.19	3.15	3.11	3.07	3.02	2.98	2.94	2.90	2.86	2.81			
73.0	3.75	3.92	3.77	3.73	3.69	3.65	3.60	3.56	3.52	3.48	3.44	3.39	3.35	3.31	3.27	3.23	3.18	3.14	3.10	3.06	3.02	2.97	2.93	2.89	2.85			
73.5	3.78	3.95	3.81	3.76	3.72	3.68	3.64	3.60	3.55	3.51	3.47	3.43	3.39	3.34	3.30	3.26	3.22	3.18	3.13	3.09	3.05	3.01	2.97	2.92	2.88			
74.0	3.82	3.99	3.84	3.80	3.76	3.71	3.67	3.63	3.59	3.55	3.50	3.46	3.42	3.38	3.34	3.29	3.25	3.21	3.17	3.13	3.08	3.04	3.00	2.96	2.92			
74.5	3.85	4.02	3.87	3.83	3.79	3.75	3.71	3.66	3.62	3.58	3.54	3.50	3.45	3.41	3.37	3.33	3.29	3.24	3.20	3.16	3.12	3.08	3.03	2.99	2.95			
75.0	3.89	4.06	3.91	3.87	3.82	3.78	3.74	3.70	3.66	3.61	3.57	3.53	3.49	3.45	3.40	3.36	3.32	3.28	3.24	3.19	3.15	3.11	3.07	3.03	2.98			
75.5	3.92	4.09	3.94	3.90	3.86	3.82	3.77	3.73	3.69	3.65	3.61	3.56	3.52	3.48	3.44	3.40	3.35	3.31	3.27	3.23	3.19	3.14	3.10	3.06	3.02			
76.0	3.95	4.12	3.98	3.94	3.89	3.85	3.81	3.77	3.73	3.69	3.64	3.60	3.56	3.52	3.47	3.43	3.39	3.35	3.31	3.26	3.22	3.18	3.14	3.10	3.05			
76.5	3.99	4.16	4.01	3.97	3.93	3.89	3.84	3.80	3.76	3.72	3.68	3.63	3.59	3.55	3.51	3.47	3.42	3.38	3.34	3.30	3.26	3.21	3.17	3.13	3.09			
77.0	4.02																											

accumulating volume before (i) the volume change for a 0.5 second interval is less than 25 milliliters or (ii) the flow is less than 50 milliliters per second for a 0.5 second interval.

(i) The forced vital capacity (FVC) and forced expiratory volume in 1 second $FEV_{1.0}$ measurements shall comply with the accuracy requirements stated in (a) of this subsection. That is, they should be accurately measured to within ± 50 ml or within ± 3 percent of reading, whichever is greater.

(j) The instrument must be capable of being calibrated in the field with respect to the FEV_1 and FVC. This calibration of the FEV_1 and FVC may be either directly or indirectly through volume and time base measurements. The volume calibration source should provide a volume displacement of at least 2 liters and should be accurate to within ± 30 milliliters.

(2) TECHNIQUE FOR MEASUREMENT OF FORCED VITAL CAPACITY MANEUVER.

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

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

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

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

(iv) Has coughed or closed his glottis,

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

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

(vii) Has an excessive variability between the three acceptable curves. The variation between the two largest FVC's and FEV_1 's of the three satisfactory tracings should not exceed 10 percent or ± 100 milliliters, whichever is greater.

(b) Periodic and routine recalibration of the instrument or method for recording FVC and $FEV_{1.0}$ should

be performed using a syringe or other volume source of at least 2 liters.

(3) INTERPRETATION OF SPIROGRAM.

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

(b) The following guidelines are recommended by NIOSH for the evaluation and management of workers exposed to cotton dust. It is important to note that employees who show reductions in FEV_1 /FVC ratio below .75 or drops in Monday FEV_1 of 5 percent or greater on their initial screening exam, should be reevaluated within a month of the first exam. Those who show consistent decrease in lung function, as shown on the following table, should be managed as recommended.

(4) QUALIFICATIONS OF PERSONNEL ADMINISTERING THE TEST.

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

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

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

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

(d) Data quality with emphasis on reproducibility.

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

(f) Measurement of tracings and calculations of results.

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

WAC 296-62-146 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-62-14601 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-62-14603 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-62-14605 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-62-14607 Repealed. See Disposition Table at beginning of this chapter.

PART O--COKE OVENS

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

(1) Priority of compliance methods.

(a) Existing coke oven batteries.

(i) The employer shall institute the engineering and work practice controls listed in subsections (2), (3) and (4) of this section in existing coke oven batteries at the earliest possible time, but not later than January 20, 1980, except to the extent that the employer can establish that such controls are not feasible. In determining the earliest possible time for institution of engineering and work practice controls, the requirement, effective August 27, 1971, to implement feasible administrative or engineering controls to reduce exposures to coal tar pitch volatiles, shall be considered. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of WAC 296-62-20011.

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

(b) New or rehabilitated coke oven batteries.

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

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

(c) Beehive ovens.

(i) The employer shall institute engineering and work practice controls on all beehive ovens at the earliest possible time to reduce and maintain employee exposures at or below the permissible exposure limit, except to the extent that the employer can establish that such controls are not feasible. In determining the earliest possible time for institution of engineering and work practice controls, the requirement, effective August 27, 1971, to implement feasible administrative or engineering controls to reduce exposures to coal tar pitch volatiles, shall be considered. Wherever the engineering and work practice controls which can be instituted are not sufficient to reduce employee exposures to or below the permissible exposure limit, the employer shall nonetheless use them to reduce exposures to the lowest level achievable by these controls and shall supplement them by the use of respiratory protection which complies with the requirements of WAC 296-62-20011.

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

(2) Engineering controls.

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

(i) One of the following methods of charging:

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

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

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

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

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

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

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

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

(vii) Mechanized gooseneck and standpipe cleaners;

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

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

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

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

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

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

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

(v) Heat shields on door machines.

(3) Work practice controls.

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

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

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

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

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

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

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

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

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

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

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

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

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

(I) The aspiration system turned on;

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

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

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

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

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

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

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

(b) Coking. The employer shall operate existing coke oven batteries pursuant to a detailed written procedure established and implemented for the control of coke oven

emissions during coking, consisting of at least the following elements:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(v) Prevention of miscellaneous fugitive topside emissions;

(vi) Regular inspection and patching of over brickwork;

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

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

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

(A) Prevention of miscellaneous fugitive topside emissions; and

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

(4) Filtered air.

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

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

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

(6) Compliance program.

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

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

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

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

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

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

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

(vi) Other relevant information.

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

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

(7) Training in compliance procedures. The employer shall incorporate all written procedures and schedules

required under this section in the education and training program required under WAC 296-62-20019 and, where appropriate, post in the regulated area.

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

PART P--HAZARDOUS WASTE OPERATIONS AND EMERGENCY RESPONSE

WAC 296-62-300 Scope, application, and definitions. (1) Scope for operations other than emergency response. This section covers employers and employees engaged in the following operations:

(a) Hazardous substance response operations that are conducted under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended (42 U.S.C. 9601 et seq.) (CERCLA), including initial investigations at CERCLA sites before the presence or absence of hazardous substances has been ascertained;

(b) Major corrective actions taken in clean-up operations under the Resource Conservation and Recovery Act of 1976 as amended (42 U.S.C. 6901 et seq.) (RCRA);

(c) Operations involving hazardous waste storage, disposal, and treatment facilities regulated under WAC 173-303-400 pursuant to RCRA;

(d) Hazardous waste operations sites that have been designated for clean-up by state or local governmental authorities; and

(2) Scope for emergency response operations. This section also covers employers whose employees have a reasonable possibility of engaging in emergency response operations for releases of, or substantial threats of releases of, hazardous substances without regard to the location of the hazard.

(3) Application.

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

(b) All sections of this part except WAC 296-62-3110 and 296-62-3140 apply to operations involving hazardous substances conducted under CERCLA, major corrective actions taken in clean-up operations under RCRA, and hazardous waste operations that have been designated for clean-up by state or local governmental authorities.

(c) Only the requirements of WAC 296-62-3110 and 296-62-3140 apply to those operations involving hazardous waste storage, disposal, and treatment facilities regulated under WAC 173-303-400.

Exceptions: For small quantity generators and generators with less than ninety days accumulation of hazardous wastes who have emergency response teams that respond to releases of, or substantial threats of releases of, hazardous substances, only WAC 296-62-3110 is applicable. Small

quantity generators and generators with less than ninety days accumulation of hazardous wastes who do not have emergency response teams that respond to releases of, or substantial threats of releases of, hazardous substances are exempt from the regulations of this section.

(d) WAC 296-62-3110 applies to all emergency response operations for releases of, or substantial threats of releases of hazardous substances including those releases of or substantial threats of releases that occur at worksites other than those sites identified in (a) through (c) of this subsection.

(4) Definitions.

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

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

(c) "Emergency response" means a coordinated response effort by employees from outside the immediate release area or by outside responders (i.e., mutual aid groups, local fire departments, etc.) to an occurrence which results, or is likely to result, in an uncontrolled release of a hazardous substance. Responses to incidental releases of hazardous substances where the substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area are not considered to be emergency responses within the scope of this standard. Responses to release of hazardous substances where the concentration of hazardous substance is below the established permissible exposure limits established in this standard are not considered to be emergency responses.

(d) "Established exposure levels" means the inhalation or dermal permissible exposure limit specified, in this chapter, or if none is specified, the exposure limits in "NIOSH Recommendations for Occupational Health Standards" dated 1986 incorporated by reference, or if neither of the above is specified, the standards specified by the American Conference of Governmental Industrial Hygienists in their publication "Threshold Limit Values and Biological Exposure Indices for 1986-87" dated 1986" incorporated by reference. The two documents incorporated by reference are available for purchase from the following:

NIOSH, Publications Dissemination, Division of Standards Development and Technology Transfer, National Institute for Occupational Safety and Health, 4676 Columbia Parkway, Cincinnati, OH 45226, (513) 841-4287; and

American Conference of Governmental Industrial Hygienists, 6500 Glenway Ave., Building D-7, Cincinnati, OH 45211-4438, (513) 661-7881 and are available for inspection and copying at the OSHA Docket Office, Docket No. S-760, Room N-3671, 200 Constitution Ave., N.W., Washington, DC 20210.

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

(f) "Hazardous materials (HAZMAT) team" means an organized group of employees, designated by the employer, who are knowledgeable and specifically trained and skilled to handle and control leaking containers or vessels, use and select special chemical protective clothing and perform other duties associated with accidental releases of hazardous substances. The team members perform responses to releases of hazardous substances for the purpose of control or stabilization of the release. A HAZMAT team is not a fire brigade nor is a typical fire brigade a HAZMAT team. A HAZMAT team, however, may be a separate component of a fire brigade.

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

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

(ii) Any biological agent and other disease-causing agent as defined in section 101(33) of CERCLA;

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

(iv) Hazardous waste.

(h) "Hazardous waste" means:

(i) A waste or combination of wastes as defined in WAC 173-303-040; or

(ii) Those substances defined in WAC 480-12-195.

(i) "Hazardous waste operation" means any operation conducted within the scope of this standard involving employee exposure to hazardous wastes, hazardous substances, or any combination of hazardous wastes and hazardous substances.

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

(k) "Health hazard" means a chemical, mixture of chemicals, or a pathogen for which there is statistically significant evidence based on at least one study conducted in accordance with established scientific principles that acute or chronic health effects may occur in exposed employees. The term "health hazard" includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system, and agents which damage the lungs, skin, eyes, or mucous membranes. Further definition of the terms used above can be found in Appendix A to WAC 296-62-054 through 296-62-05427.

(l) "IDLH" or "immediately dangerous to life or health" means any atmospheric concentration of any

toxic, corrosive, or asphyxiant substance that poses an immediate threat to life or would cause irreversible or delayed adverse health effects or would interfere with an individual's ability to escape from a dangerous atmosphere.

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

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

(o) "Post emergency response" means that portion of an emergency response performed after the immediate threat of a release has been stabilized or eliminated and clean-up of the site has begun. If post emergency response is performed by an employer's own employees as a continuation of initial emergency response, it is considered to be part of the initial response and not post emergency response.

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

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

(r) "Small quantity generator" means a generator of hazardous wastes who in any calendar month generates no more than 1000 kilograms (2210 pounds) of hazardous waste in that month.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-300, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3010 General requirements. (1) Safety and health program.

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

(i) Organizational structure chapter;

(ii) A comprehensive workplan chapter; and

(iii) A site-specific safety and health plan chapter.

(b) Organizational structure chapter.

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

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

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

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

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

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

(iii) The original organizational structure plan and any changes to the overall organizational structure shall be made available to all affected employees.

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

(i) The comprehensive workplan shall address anticipated clean-up activities as well as normal operating procedures.

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

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

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

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

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

(d) Site-specific safety and health plan chapter. The site safety and health plan, which is part of the overall safety and health program shall be available on the site for inspection by employees, their designated representatives, and WISHA personnel, shall address the safety and health hazards of each phase of site operation; and include the requirements and procedures for employee protection.

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

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

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

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

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

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

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

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

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

(I) An emergency response plan meeting the requirements of WAC 296-62-3110 for safe and effective responses to emergencies, including the necessary PPE and other equipment.

(J) Confined space entry procedures.

(ii) Preentry briefings shall be held prior to initiating any site activity and at such other times as necessary to ensure that employees are apprised of the site safety and health plan and that this plan is being followed.

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

(iv) When major spills may be anticipated due to the type of work involved, a spill containment program meeting the requirements of WAC 296-62-3080.

(2) Site excavation. Site excavations created during initial site preparation or during hazardous waste operations shall be shored or sloped as appropriate to prevent accidental collapse in accordance with WAC 296-155-650 through 296-155-66505.

(3) Contractors and subcontractors.

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

(b) The safety and health program required in this section shall be made available to any subcontractor or its representative who will be involved with the hazardous waste operation and employees, their designated representatives, and WISHA personnel.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-3010, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3020 Site characterization and analysis. Hazardous waste sites shall be evaluated in accordance with this section to identify specific site hazards and to determine the appropriate safety and health control procedures needed to protect employees from the identified hazards.

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

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

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

- (a) Location and approximate size of the site.
- (b) Description of the response activity and/or the job task to be performed.
- (c) Duration of the planned employee activity.
- (d) Site topography.
- (e) Site accessibility by air and roads.
- (f) Pathways for hazardous substance dispersion.
- (g) Present status and capabilities of emergency response teams that would provide assistance to on-site employees at the time of an emergency.
- (h) Hazardous substances and health hazards involved or expected at the site and their chemical and physical properties.

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

(a) Based upon the results of the preliminary site evaluation, an ensemble of PPE shall be selected and used during initial site entry which will provide protection to a level of exposure below established permissible exposure limits for known or suspected hazardous substances and health hazards and which will provide protection against other known and suspected hazards identified during the preliminary site evaluation.

(b) During initial site entry an escape self-contained breathing apparatus of at least five minutes' duration shall be carried by employees or kept available at their immediate work station if positive-pressure self-contained breathing apparatus is not used as part of the entry ensemble.

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

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

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

(a) Monitoring for hazardous levels of ionizing radiation.

(b) Monitoring the air with appropriate test equipment for IDLH and other conditions that may cause death or serious harm (combustible or explosive atmospheres, oxygen deficiency, toxic substances).

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

(6) Once the presence and concentrations of specific hazardous substances and health hazards have been established, the risks associated with these substances shall be identified. Employees who will be working on the site shall be informed of any risks that have been identified. In situations covered by WAC 296-62-054 through 296-62-05425, training required by that standard need not be duplicated.

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

Exposures exceeding the appropriate threshold limit values (TLVs), permissible exposure limits (PELs), or recommended exposure limits (RELs).

IDLH concentrations.

Potential skin absorption and irritation sources.

Potential eye irritation sources.

Explosion sensitivity and flammability ranges.

(7) Any information concerning the chemical, physical, and toxicologic properties of each substance known or expected to be present on site that is available to the employer and relevant to the duties an employee is expected to perform shall be made available to all employees prior to the commencement of their work activities.

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

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-3020, filed 10/6/88, effective 11/7/88.]

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

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

(2) The site control program shall, as a minimum, include: A site map, site work zones, the use of a "buddy system," site communications, the standard operating procedures or safe work practices, and identification of nearest medical assistance.

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

WAC 296-62-3040 Training. (1) All employees (such as but not limited to equipment operators and general laborers) exposed to hazardous substances, health hazards, or safety hazards shall be thoroughly trained in the following:

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

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

(c) Use of PPE;

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

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

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

(g) The site safety and health plan set forth in WAC 296-62-3010 (1)(d).

(2) All employees shall at the time of job assignment receive a minimum of forty hours of initial instruction off the site, and a minimum of three days of actual field experience under the direct supervision of a trained, experienced supervisor. Workers who may be exposed to unique or special hazards shall be provided additional training. The level of training provided shall be consistent with the employee's job function and responsibilities.

(3) On-site management and supervisors directly responsible for or who supervise employees engaged in hazardous waste operations shall receive training as provided in subsections (1) and (2) of this section and at least eight additional hours of specialized training at the time of job assignment on such topics as, but not limited to, the employer's safety and health program and the associated employee training program, personal protective equipment program, spill containment program, and health hazard monitoring techniques.

(4) Trainers shall be qualified to instruct employees about the subject matter that is being presented in training.

Note: Trainers can show their qualifications by having the knowledge or training equivalent to a level of training higher than the level they are presenting. This may be shown by academic degrees, training courses completed and/or work experience.

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

(6) Employees and supervisors that have received and successfully completed the training and field experience specified in subsections (1), (2), and (3) of this section shall be certified by their instructor as having completed the necessary training. Any person who has not been so certified nor meets the requirements of subsection (9) of this section shall be prohibited from engaging in hazardous waste operations.

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

(8) Employees specified in subsection (1) of this section and managers specified in subsection (3) of this section shall receive eight hours of refresher training annually on the items specified in subsection (1) of this section and other relevant topics.

(9) Employers who can show that an employee's work experience and/or training has resulted in initial training

equivalent to that training required in subsections (1), (2), and (3) of this section shall not be required to provide the initial training requirements of those sections. Equivalent training includes the training that existing employees might have already received from actual site experience.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-3040, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3050 Medical surveillance. Medical surveillance shall be provided in accordance with this section for employees exposed or potentially exposed to hazardous substances or health hazards or who wear respirators.

(1) Employees covered. A medical surveillance program which is part of the employer's safety and health program required in WAC 296-62-3010 shall be instituted by the employer for the following employees:

(a) All employees who are or may be exposed to hazardous substances or health hazards at or above the established exposure levels for these substances, without regard to the use of respirators, for thirty days or more a year;

(b) All employees who wear a respirator for thirty days or more a year; and

(c) All employees who are injured due to overexposure from an emergency incident involving hazardous substances or health hazards.

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

(a) Prior to assignment or for employees covered on the effective date of this standard as specified in WAC 296-62-3150.

(b) At least once every twelve months for each employee covered.

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

(d) As soon as possible upon notification by an employee that the employee has developed signs or symptoms indicating possible overexposure to hazardous substances or health hazards or that the employee has been exposed above the established exposure levels in an emergency situation.

(e) At more frequent times, if the examining physician determines that an increased frequency of examination is medically necessary. For employees covered under subsection (1)(c) of this section and for all employees who may have been exposed during an emergency incident to hazardous substances at concentrations above the established exposure levels without the necessary personal protective equipment being used:

(i) As soon as possible following the emergency incident;

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

(3) Content of medical examinations and consultations.

(a) Medical examinations required by subsection (2) of this section shall include a medical and work history (or updated history if one is in the employee's file) with special emphasis on symptoms related to the handling of hazardous substances and health hazards, and to fitness for duty including the ability to wear any required PPE under conditions (i.e., temperature extremes) that may be expected at the worksite.

(b) The content of medical examinations or consultations made available to employees pursuant to this section shall be determined by the examining physician.

(4) Examination by a physician and costs. All medical examinations and procedures shall be performed by or under the supervision of a licensed physician; and shall be provided without cost to the employee, without loss of pay, and at a reasonable time and place.

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

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

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

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

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

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

(6) Physician's written opinion.

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

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

(ii) The physician's opinion as to whether the employee has any detected medical conditions which would place the employee at increased risk of material impairment of the employee's health from work in hazardous waste operations or emergency response or from respirators used as required in WAC 296-62-071 through 296-62-07121.

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

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

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

(7) Recordkeeping.

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

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

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

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

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

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

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-3050, filed 10/6/88, effective 11/7/88.]

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

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

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

(b) Whenever engineering controls and work practices are not feasible, PPE shall be used to reduce and maintain exposures to or below the permissible exposure limits or dose limits for substances regulated by this chapter.

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

(2) Engineering controls, work practices, and personal protective equipment for substances not regulated in this chapter. An appropriate combination of engineering controls, work practices, and personal protective equipment shall be established to reduce and maintain employee exposure to or below appropriate exposure levels for hazardous substances and health hazards not regulated by this chapter taking into account the established exposure levels.

(3) Personal protective equipment selection.

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

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

duration, and the hazards and potential hazards identified at the site.

(c) Positive pressure self-contained breathing apparatus, or positive pressure air-line respirators equipped with an escape air supply shall be used in IDLH conditions.

(d) Totally-encapsulating chemical protective suits (protection equivalent to Level A protection as specified in Appendix B) shall be used in conditions where skin absorption of a hazardous substance may result in an IDLH situation.

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

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

(f) Personal protective equipment shall be selected and used to meet the requirements of chapter 296-24 WAC, Part A-1, and additional requirements specified in this part.

(4) Totally-encapsulating chemical protective suits.

(a) Totally-encapsulating suit materials used for Level A protection shall protect employees from the particular hazards which are identified during site characterization and analysis.

(b) Totally-encapsulating suits shall be capable of maintaining positive air pressure. (See WAC 296-62-3160 - Appendix A.)

(c) Totally-encapsulating suits shall be capable of preventing inward test gas leakage of more than 0.5 percent. (See WAC 296-62-3160 - Appendix A.)

(5) Personal protective equipment (PPE) program. A personal protective equipment program which is part of the employer's safety and health program required in WAC 296-62-3010 shall be established for hazardous waste operations which shall be part of the site-specific safety and health plan. The PPE program shall address the following elements:

- (a) Site hazards;
- (b) PPE selection;
- (c) PPE use;
- (d) Work mission duration;
- (e) PPE maintenance and storage;
- (f) PPE decontamination;
- (g) PPE training and proper fitting;
- (h) PPE donning and doffing procedures;
- (i) PPE inspection;
- (j) PPE in-use monitoring;

(k) Evaluation of the effectiveness of the PPE program; and

(l) Limitations during temperature extremes, and other appropriate medical considerations.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-3060, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3070 Monitoring. Monitoring shall be performed in accordance with this section to assure proper selection of engineering controls, work practices, and personal protective equipment so that employees are not exposed to levels which exceed established permissible exposure limits for hazardous substances.

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

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

(3) Periodic monitoring shall be conducted when the possibility of an IDLH condition or flammable atmosphere has developed or when there is indication that exposures may have risen since prior monitoring. Situations where it shall be considered whether the possibility that exposures have risen are when:

(a) Work begins on a different portion of the site.

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

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

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

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

(4) After hazardous waste cleanup operations commence, the employer shall monitor those employees likely to have the highest exposures to those hazardous substances and health hazards likely to be present above established permissible exposure limits by using personal sampling frequently enough to characterize employee exposures. The employer may utilize a representative sampling approach by documenting that the employees and chemicals chosen for monitoring are based on the criteria stated in subsection (1) of this section.

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

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-3070, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3080 Informational programs. Employers shall develop and implement a program which is part of the employer's safety and health program required in WAC 296-62-3010 (1)(d)(iii) to inform employees, contractors, and subcontractors (or their representative) actually engaged in hazardous waste operations of the nature, level, and degree of exposure likely as a result of participation in such hazardous waste operations. Employees, contractors, and subcontractors working outside of the operations part of a site are not covered by this standard.

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

WAC 296-62-3090 Handling drums and containers. Hazardous substances and contaminated soils, liquids, and other residues shall be handled, transported, labeled, and disposed of in accordance with this section.

(1) General.

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

(b) When practical, drums and containers shall be inspected and their integrity shall be assured prior to being moved. Drums or containers that cannot be inspected before being moved because of storage conditions (i.e., buried beneath the earth, stacked behind other drums, stacked several tiers high in a pile, etc.) shall be moved to an accessible location and inspected prior to further handling.

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

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

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

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

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

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

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

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

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

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

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

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

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

opened to protect the employee in case of accidental explosion.

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

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

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

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

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

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

(5) Shock-sensitive wastes.

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

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

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

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

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

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

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

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

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

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

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

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

(8) Shipping and transport.

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

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

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

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

(9) Tank and vault procedures.

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

(b) Appropriate tank or vault entry procedures meeting WAC 296-62-14503 shall be followed whenever employees must enter a tank or vault.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-3090, filed 10/6/88, effective 11/7/88.]

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

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

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

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

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

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

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

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

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

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

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

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

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

WAC 296-62-3110 Emergency response. Emergency response at hazardous waste operation incidents shall be conducted in accordance with this section.

(1) General.

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

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

(i) Preemergency planning.

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

(iii) Emergency recognition and prevention.

(iv) Safe distances and places of refuge.

- (v) Site security and control.
 - (vi) Evacuation routes and procedures.
 - (vii) Decontamination.
 - (viii) Emergency medical treatment and first aid.
 - (ix) Emergency alerting and response procedures.
 - (x) Critique of response and follow-up.
 - (xi) PPE and emergency equipment.
- (2) Emergency response at hazardous waste clean-up sites.

(a) Training. Training for emergency response employees at clean-up operations shall be conducted in accordance with WAC 296-62-3040.

(b) Employers who can show that an employee's work experience and/or training has resulted in training equivalent to that training required in (a) of this subsection, shall not be required to provide the initial training requirements of (a) of this subsection. Equivalent training includes the training that existing employees might have already received from actual site work experience.

(c) Procedures for handling site emergency incidents.

(i) In addition to the elements for the emergency response plan required in subsection (1)(b) of this section, the following elements shall be included for emergency response plans:

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

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

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

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

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

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

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

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

(3) Emergency response at sites other than hazardous waste clean-up sites.

(a) Training. Employers shall provide the training specified by this section for those employees for whom there exists the reasonable possibility of responding to emergencies at sites other than hazardous waste clean-up sites.

(i) Emergency response organizations or teams. Employees on emergency response organizations or teams such as fire brigades, fire departments, plant emergency

organizations, hazardous materials teams, spill response teams, and similar groups with responsibility for emergency response shall be trained to a level of competence to protect themselves and other employees in the recognition of health and safety hazards, methods to minimize the risk from safety and health hazards, safe use of control equipment, selection and use of appropriate personal protective equipment, safe operating procedures to be used at the incident scene, techniques of coordination with other employees to minimize risks, appropriate response to over exposure from health hazards or injury to themselves and other employees, and recognition of subsequent symptoms which may result from over exposures.

(A) Competency may be demonstrated by twenty-four hours of training annually in those areas with training sessions at least monthly or by demonstrations by the employee of competency in those areas at least quarterly.

(B) A certification shall be made of the training or competency and if certification of competency is made, the employer shall keep a record of the methodology used to demonstrate competency.

(C) An employer of employees for whom the reasonable possibility of responding to emergencies at other than hazardous waste clean-up sites exists need not train all such employees to the degree specified in (a)(i)(A) of this subsection if the employer divides the work force such that sufficient employees who have responsibility to control the emergency have the training specified in this section and other employees who may first respond to the incident have sufficient awareness training to recognize that an emergency response situation exists and are instructed in that case to summon the employees who are fully trained and not attempt control activities for which they are not trained.

(D) An employer of employees for whom the reasonable possibility exists of responding to emergencies at other than hazardous waste clean-up sites need not train such employees to the degree specified in (a)(i)(A) of this subsection if:

(I) Arrangements have been made in advance for a fully-trained emergency response team to respond in a reasonable period; and

(II) Employees who may come to the incident first have sufficient awareness training to recognize that an emergency response situation exists and are instructed to call the designated fully-trained emergency response team for assistance.

(ii) Specialist employees. Employees who, in the course of their regular job duties, work with and are trained in the hazards of specific materials covered by this standard, and who will be called upon to provide technical advice or assistance at a hazardous substance release incident, are exempt from the monthly training sessions required in (a)(i) of this subsection. They must, pursuant to (a)(i) of this subsection, however, receive at least twenty-four hours of training annually or demonstrate competency in the area of their specialization.

(iii) Skilled support personnel. Personnel, not necessarily an employer's own employees, who are needed to

perform immediate emergency support work that cannot reasonably be performed in a timely fashion by an employer's own employees, and who will be or may potentially be exposed to the hazards at an emergency response scene, are not required to have the twenty-four hours of annual training or demonstrate the competency required for the employer's regular employees. However, the senior official cited in (b)(i) of this subsection shall ensure that these personnel are given an initial briefing at the site of emergency response prior to their participation in that response that shall include instruction in the wearing of appropriate personal protective equipment, what chemical hazards are involved, and what duties are to be performed. All appropriate safety and health precautions provided to the employer's own employees shall be used to assure the safety and health of these personnel.

(b) Procedures for handling off-site emergency response.

(i) The senior officer responding to an emergency at other than hazardous waste clean-up sites involving a hazardous substance or health hazard shall establish and become the individual in charge of a site-specific incident command system (ICS). All emergency responders and their communications shall be coordinated and controlled through the individual in charge of the ICS assisted by the senior official present for each employer.

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

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

(iii) Based on the hazardous substances and/or conditions present, the individual in charge of the ICS shall implement appropriate emergency operations, and assure that the personal protective equipment worn is appropriate for the hazards to be encountered. However, personal protective equipment shall meet, at a minimum, the criteria contained in WAC 296-24-58505 through 296-24-58507 when worn while performing fire fighting operations beyond the incipient stage.

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

(v) The individual in charge of the ICS shall limit the number of emergency response personnel at the emergency site to those who are actively performing emergency operations. However, operations in hazardous

areas shall be performed using the buddy system in groups of two or more.

(vi) Back-up personnel shall stand by with equipment ready to provide assistance or rescue. Qualified basic life support personnel, as a minimum, shall also stand by with medical equipment and transportation capability.

(vii) The individual in charge of the ICS shall designate a safety official, who is knowledgeable in the operations being implemented at the emergency response site, with specific responsibility to identify and evaluate hazards and to provide direction with respect to the safety of operations for the emergency at hand.

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

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

(x) When deemed necessary for meeting the tasks at hand, approved self-contained compressed air breathing apparatus may be used with approved cylinders from other approved self-contained compressed air breathing apparatus provided that such cylinders are of the same capacity and pressure rating. All compressed air cylinders used with self-contained breathing apparatus shall meet United States Department of Transportation and National Institute for Occupational Safety and Health criteria.

(4) Hazardous materials teams (HAZMAT).

(a) Employees who are members of the HAZMAT team shall be given training in accordance with subsection (3) of this section that includes the care and use of chemical protective clothing and procedures to be followed when working on leaking drums, containers, tanks, or bulk transport vehicles.

(b) Members of HAZMAT teams shall receive a base line physical exam and have medical surveillance meeting the requirements of WAC 296-62-3050.

(c) Chemical personal protective clothing and equipment to be used by HAZMAT team members shall meet the requirements of WAC 296-62-3060.

(5) Post-emergency response operations. Upon completion of the emergency response, if it is determined that it is necessary to remove hazardous substances, health hazards and materials contaminated with them (such as contaminated soil or other elements of the natural environment) from the site of the incident the employer conducting the clean-up shall comply with one of the following:

(a) Meet all the requirements of WAC 296-62-3010 through 296-62-3130.

(b) Where the clean-up is done on plant property using plant or workplace employees, such employees shall have completed the training requirements of the following: WAC 296-24-567, 296-24-07109(6), 296-62-05415(2), and other appropriate safety and health training made necessary by the tasks that they are expected

to be performed. All equipment to be used in the performance of the clean-up work shall be in serviceable condition and shall have been inspected prior to use.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-3110, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3120 Illumination. Areas accessible to employees shall be lighted in accordance with the requirements of this section.

Work areas shall be lighted to not less than the minimum illumination intensities listed in Table 1 while any work is in progress:

TABLE 1 - 120.1 - MINIMUM ILLUMINATION Intensities in Foot-Candles

Foot-candles	Area or operation
5	General site area.
3	Excavation and waste areas, accessways, active storage areas, loading platforms, refueling, and field maintenance areas.
5	Indoors: Warehouses, corridors, hallways, and exitways.
5	Tunnels, shafts, and general underground work areas; exception: Minimum of ten foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Bureau of Mines approved cap lights shall be acceptable for use in the tunnel heading.
10	General shops (e.g., mechanical and electrical equipment rooms, active storerooms, barracks or living quarters, locker or dressing rooms, dining areas, and indoor toilets and workrooms).
30	First aid stations, infirmaries, and offices.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-3120, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3130 Sanitation at temporary workplaces. Facilities for employee sanitation shall be provided in accordance with this section.

(1) Potable water.

(a) An adequate supply of potable water shall be provided on the site.

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

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

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

(2) Nonpotable water.

(a) Outlets for nonpotable water, such as water for fire fighting purposes shall be identified to indicate clearly that the water is unsafe and is not to be used for drinking, washing, or cooking purposes.

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

(3) Toilet facilities.

(a) Toilets shall be provided for employees according to Table 2.

TABLE 2 - TOILET FACILITIES

Number of employees	Minimum number of facilities
20 or fewer	One.
More than 20, fewer than 200	One toilet seat and one urinal per 40 employees.
More than 200	One toilet seat and one urinal per 50 employees.

(b) Under temporary field conditions, provisions shall be made to assure not less than one toilet facility is available.

(c) Hazardous waste sites, not provided with a sanitary sewer shall be provided with the following toilet facilities unless prohibited by local codes:

- (i) Chemical toilets;
- (ii) Recirculating toilets;
- (iii) Combustion toilets; or
- (iv) Flush toilets.

(d) The requirements of this section for sanitation facilities shall not apply to mobile crews having transportation readily available to nearby toilet facilities.

(e) Doors entering toilet facilities shall be provided with entrance locks controlled from inside the facility.

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

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

(6) Washing facilities. The employer shall provide adequate washing facilities for employees engaged in operations where hazardous substances may be harmful to employees. Such facilities shall be in near proximity to the worksite, in areas where exposures are below established permissible exposure limits and which are under the controls of the employer, and shall be so equipped as to enable employees to remove hazardous substances from themselves.

(7) Showers and change rooms. When hazardous waste clean-up or removal operations commence on a site and the duration of the work will require six months or greater time to complete, the employer shall provide showers and change rooms for all employees exposed to

hazardous substances and health hazards involved in hazardous waste clean-up or removal operations.

(a) Showers shall be provided and shall meet the requirements of WAC 296-24-12009(3).

(b) Change rooms shall be provided and shall meet the requirements of WAC 296-24-12011. Change rooms shall consist of two separate change areas separated by the shower area required in (a) of this subsection. One change area, with an exit leading off the worksite, shall provide employees with a clean area where they can remove, store, and put on street clothing. The second area, with an exit to the worksite, shall provide employees with an area where they can put on, remove and store work clothing and personal protective equipment.

(c) Showers and change rooms shall be located in areas where exposures are below the established permissible exposure limits. If this cannot be accomplished, then a ventilation system shall be provided that will supply air that is below the established permissible exposure limits.

(d) Employers shall assure that employees shower at the end of their work shift and when leaving the hazardous waste site.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-3130, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3140 Certain operations conducted under the Resource Conservation and Recovery Act of 1976 (RCRA). Employers conducting operations specified in WAC 296-62-3060 (2)(c) shall:

(1) Develop and implement a written safety and health program for employees involved in hazardous waste operations which shall be available for inspection by employees, their representatives and WISHA personnel. The program shall be designed to identify, evaluate and control safety and health hazards in their facilities for the purpose of employee protection, and provide for emergency response meeting the requirements of WAC 296-62-3110 and it shall address as appropriate site analysis, engineering controls, maximum exposure limits, hazardous waste handling procedures and uses of new technologies;

(2) Implement a hazard communication program as part of the employer's safety and health program meeting the requirements of WAC 296-62-054 through 296-62-05427;

(3) Implement a medical surveillance program meeting the requirements of WAC 296-62-3050;

(4) Develop and implement a decontamination procedure in accordance with WAC 296-62-3100; and

(5) Develop and implement a training program, which is part of the employer's safety and health program, for employees involved with hazardous waste operations to enable each employee to perform their assigned duties and functions in a safe and healthful manner so as not to endanger themselves or other employees. The initial training shall be for twenty-four hours and refresher training shall be for eight hours annually.

Employers who can show by an employee's previous work experience and/or training that the employee has had training equivalent to the initial training required by

this section, shall be considered as meeting the initial training of this section as to that employee. Equivalent training includes the training that existing employees might have already received from actual site work experience. Employees who have received the initial training required by this paragraph shall be given a written certificate attesting that they have successfully completed the necessary training.

(6) New technology programs.

(a) The employer shall develop and implement procedures for the introduction of effective new technologies and equipment developed for the improved protection of employees working with hazardous waste clean-up operations, and the same shall be implemented as part of the site safety and health program to assure that employee protection is being maintained.

(b) New technologies, equipment, or control measures available to the industry, such as the use of foams or other means to suppress the level of air contaminants while excavating the site or for spill control, shall be evaluated by employers or their representatives to determine their effectiveness before implementing their use on a large scale for employee protection. Such evaluations shall be made available to WISHA upon request.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-3140, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3150 Start-up dates. The engineering controls, work practices, and personal protective equipment required by WAC 296-62-3060(1) are existing requirements of other WISHA standards and continues to be required from the effective date of this standard.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-3150, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3152 Appendices to Part P--Hazardous waste operations and emergency response.

Note: The following appendices serve as nonmandatory guidelines to assist employees and employers in complying with the appropriate requirements of this part. However, WAC 296-62-3170 - Appendix B is required in certain circumstances by WAC 296-62-3020 (4)(c) and 296-62-3060 (3)(d) makes mandatory in certain circumstances the use of Level A and Level B personal protective equipment protection.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-3152, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3160 Appendix A--Personal protective equipment test methods. This appendix sets forth the nonmandatory examples of tests which may be used to evaluate compliance with WAC 296-62-3060. Other tests and other challenge agents may be used to evaluate compliance.

(1) Totally-encapsulating chemical protective suit pressure test.

(a) Scope.

(i) This practice measures the ability of a gas tight totally-encapsulating chemical protective suit material, seams, and closures to maintain a fixed positive pressure. The results of this practice allow the gas tight integrity of a total-encapsulating chemical protective suit to be evaluated.

(ii) Resistance of the suit materials to permeation, penetration, and degradation by specific hazardous substances is not determined by this test method.

(b) Description of terms.

(i) "Totally-encapsulated chemical protective suit (TECP suit)" means a full body garment which is constructed of protective clothing materials; covers the wearer's torso, head, arms, and legs; may cover the wearer's hands and feet with tightly attached gloves and boots; completely encloses the wearer by itself or in combination with the wearer's respiratory equipment, gloves, and boots.

(ii) "Protective clothing material" means any material or combination of materials used in an item of clothing for the purpose of isolating parts of the body from direct contact with a potentially hazardous liquid or gaseous chemicals.

(iii) "Gas tight" means for the purpose of this practice the limited flow of a gas under pressure from the inside of a TECP suit to atmosphere at a prescribed pressure and time interval.

(c) Summary of test method. The TECP suit is visually inspected and modified for the test. The test apparatus is attached to the suit to permit inflation to the pretest suit expansion pressure for removal of suit wrinkles and creases. The pressure is lowered to the test pressure and monitored for three minutes. If the pressure drop is excessive, the TECP suit fails the test and is removed from service. The test is repeated after leak location and repair.

(d) Required supplies.

(i) Source of compressed air.

(ii) Test apparatus for suit testing including a pressure measurement device with a sensitivity of at least 1/4 inch water gauge.

(iii) Vent valve closure plugs or sealing tape.

(vi) Soapy water solution and soft brush.

(v) Stop watch or appropriate timing device.

(e) Safety precautions. Care shall be taken to provide the correct pressure safety devices required for the source of compressed air used.

(f) Test procedure. Prior to each test, the tester shall perform a visual inspection of the suit. Check the suit for seam integrity by visually examining the seams and gently pulling on the seams. Ensure that all air supply lines, fittings, visor, zippers, and valves are secure and show no signs of deterioration.

(i) Seal off the vent valves along with any other normal inlet or exhaust points (such as umbilical air line fittings or facepiece opening) with tape or other appropriate means (caps, plugs, fixture, etc.). Care should be exercised in the sealing process not to damage any of the suit components.

(ii) Close all closure assemblies.

(iii) Prepare the suit for inflation by providing an improvised connection point on the suit for connecting an airline. Attach the pressure test apparatus to the suit to permit suit inflation from a compressed air source equipped with a pressure indicating regulator. The leak tightness of the pressure test apparatus should be tested before and after each test by closing off the end of the

tubing attached to the suit and assuring a pressure of three inches water gauge for three minutes can be maintained. If a component is removed for the test, that component shall be replaced and a second test conducted with another component removed to permit a complete test of the ensemble.

(iv) The pretest expansion pressure (A) and the suit test pressure (B) shall be supplied by the suit manufacturer, but in no case shall they be less than A=3 inches water gauge and B=2 inches water gauge. The ending suit pressure (C) shall be no less than eighty percent of the test pressure (B); i.e., the pressure drop shall not exceed twenty percent of the test pressure (B).

(v) Inflate the suit until the pressure inside is equal to pressure "A", the pretest expansion suit pressure. Allow at least one minute to fill out the wrinkles in the suit. Release sufficient air to reduce the suit pressure to pressure "B", the suit test pressure. Begin timing. At the end of three minutes, record the suit pressure as pressure "C", the ending suit pressure. The difference between the suit test pressure and the ending suit test pressure ("B-C") shall be defined as the suit pressure drop.

(vi) If the suit pressure drop is more than twenty percent of the suit test pressure "B" during the three minute test period, the suit fails the test and shall be removed from service.

(g) Retest procedure.

(i) If the suit fails the test check for leaks by inflating the suit to pressure "A" and brushing or wiping the entire suit (including seams, closures, lens gaskets, glove-to-sleeve joints, etc.) with a mild soap and water solution. Observe the suit for the formation of soap bubbles, which is an indication of a leak. Repair all identified leaks.

(ii) Retest the TECP suit as outlined in (f) of this subsection.

(h) Report. Each TECP suit tested by this practice shall have the following information recorded.

(i) Unique identification number identifying brand name, date of purchase, material of construction, and unique fit features; e.g., special breathing apparatus.

(ii) The actual values for test pressures "A", "B", and "C" shall be recorded along with the specific observation times. If the ending pressure ("C") is less than eighty percent of the test pressure ("B") the suit shall be identified as failing the test. When possible, the specific leak location shall be identified in the test records. Retest pressure data shall be recorded as an additional test.

(iii) The source of the test apparatus used shall be identified and the sensitivity of the pressure gauge shall be recorded.

(iv) Records shall be kept for each pressure test even if repairs are being made at the test location.

Caution. Visually inspect all parts of the suit to be sure they are positioned correctly and secured tightly before putting the suit back into service. Special care should be taken to examine each exhaust valve to make sure it is not blocked. Care should also be exercised to assure that the inside and outside of the suit is completely dry before it is put into storage.

(2) Totally-encapsulating chemical protective suit qualitative leak test.

(a) Scope.

(i) This practice semiquantitatively tests gas tight totally-encapsulating chemical protective suit integrity by detecting inward leakage of ammonia vapor. Since no modifications are made to the suit to carry out this test, the results from this practice provide a realistic test for the integrity of the entire suit.

(ii) Resistance of the suit materials to permeation, penetration, and degradation is not determined by this test method.

(b) Definition of terms.

(i) "Totally-encapsulated chemical protective suit (TECP suit)" means a full body garment which is constructed of protective clothing materials; covers the wearer's torso, head, arms, and legs; may cover the wearer's hands and feet with tightly attached gloves and boots; completely encloses the wearer by itself or in combination with the wearer's respiratory equipment, gloves, and boots.

(ii) "Protective clothing material" means any material or combination of materials used in an item of clothing for the purpose of isolating parts of the body from direct contact with a potentially hazardous liquid or gaseous chemicals.

(iii) "Gas tight" means for the purpose of this test method the limited flow of a gas under pressure from the inside of a TECP suit to atmosphere at a prescribed pressure and time interval.

(iv) "Intrusion coefficient." A number expressing the level of protection provided by a gas tight totally-encapsulating chemical protective suit. The intrusion coefficient is calculated by dividing the test room challenge agent concentration by the concentration of challenge agent found inside the suit. The accuracy of the intrusion coefficient is dependent on the challenge agent monitoring methods. The larger the intrusion coefficient, the greater the protection provided by the TECP suit.

(c) Summary of recommended practice. The volume of concentrated aqueous ammonia solution (ammonia hydroxide, NH_4OH) required to generate the test atmosphere is determined using the directions outlined in WAC 296-62-3190 (2)(f)(i). The suit is donned by a person wearing the appropriate respiratory equipment (either a self-contained breathing apparatus or a supplied air respirator) and worn inside the enclosed test room. The concentrated aqueous ammonia solution is taken by the suited individual into the test room and poured into an open plastic pan. A two-minute evaporation period is observed before the test room concentration is measured using a high range ammonia length of stain detector tube. When the ammonia reaches a concentration of between 1000 and 1200 ppm, the suited individual starts a standardized exercise protocol to stress and flex the suit. After this protocol is completed the test room concentration is measured again. The suited individual exits the test room and his stand-by person measures the ammonia concentration inside the suit using a low range ammonia length of stain detector tube or other more sensitive ammonia detector. A stand-

by person is required to observe the test individual during the test procedure, aid the person in donning and doffing the TECP suit and monitor the suit interior. The intrusion coefficient of the suit can be calculated by dividing the average test area concentration by the interior suit concentration. A colorimetric indicator strip of bromophenol blue is placed on the inside of the suit facepiece lens so that the suited individual is able to detect a color change and know if the suit has a significant leak. If a color change is observed the individual should leave the test room immediately.

(d) Required supplies.

(i) A supply of concentrated ammonia (fifty-eight percent ammonium hydroxide by weight).

(ii) A supply of bromophenol/blue indicating paper, sensitive to 5-10 ppm ammonia or greater over a two-minute period of exposure [pH 3.0 (yellow) to pH 4.6 (blue)].

(iii) A supply of high range (0.5-10 volume percent) and low range (5-700 ppm) detector tubes for ammonia and the corresponding sampling pump. More sensitive ammonia detectors can be substituted for the low range detector tubes to improve the sensitivity of this practice.

(iv) A shallow plastic pan (PVC) at least 12":14":1" and a half pint plastic container (PVC) with tightly closing lid.

(v) A graduated cylinder or other volumetric measuring device of at least fifty milliliters in volume with an accuracy of at least ± 1 milliliters.

(e) Safety precautions.

(i) Concentrated aqueous ammonium hydroxide, NH_4OH is a corrosive volatile liquid requiring eye, skin, and respiratory protection. The person conducting the test shall review the MSDS for aqueous ammonia.

(ii) Since the established permissible exposure limit for ammonia is 50 ppm, only persons wearing a self-contained breathing apparatus or a supplied air respirator shall be in the chamber. Normally only the person wearing the total-encapsulating suit will be inside the chamber. A stand-by person shall have a self-contained breathing apparatus, or a supplied air respirator, available to enter the test area should the suited individual need assistance.

(iii) A method to monitor the suited individual must be used during this test. Visual contact is the simplest but other methods using communication devices are acceptable.

(iv) The test room shall be large enough to allow the exercise protocol to be carried out and then to be ventilated to allow for easy exhaust of the ammonia test atmosphere after the test(s) are completed.

(v) Individuals shall be medically screened for the use of respiratory protection and checked for allergies to ammonia before participating in this test procedure.

(f) Test procedure.

(i) Measure the test area to the nearest foot and calculate its volume in cubic feet. Multiply the test area volume by 0.2 milliliters of concentrated aqueous ammonia per cubic foot of test area volume to determine the approximate volume of concentrated aqueous ammonia required to generate 1000 ppm in the test area.

(A) Measure this volume from the supply of concentrated ammonia and place it into a closed plastic container.

(B) Place the container, several high range ammonia detector tubes and the pump in the clean test pan and locate it near the test area entry door so that the suited individual has easy access to these supplies.

(ii) In a noncontaminated atmosphere, open a presealed ammonia indicator strip and fasten one end of the strip to the inside of the suit face shield lens where it can be seen by the wearer. Moisten the indicator strip with distilled water. Care shall be taken not to contaminate the detector part of the indicator paper by touching it. A small piece of masking tape or equivalent should be used to attach the indicator strip to the interior of the suit face shield.

(iii) If problems are encountered with this method of attachment the indicator strip can be attached to the outside of the respirator facepiece being used during the test.

(iv) Don the respiratory protective device normally used with the suit, and then don the TECP suit to be tested. Check to be sure all openings which are intended to be sealed (zippers, gloves, etc.) are completely sealed. Do NOT, however, plug off any venting valves.

(v) Step into the enclosed test room such as a closet, bathroom, or test booth, equipped with an exhaust fan. No air should be exhausted from the chamber during the test because this will dilute the ammonia challenge concentrations.

(vi) Open the container with the premeasured volume of concentrated aqueous ammonia within the enclosed test room, and pour the liquid into the empty plastic test pan. Wait two minutes to allow for adequate volatilization of the concentrated aqueous ammonia. A small mixing fan can be used near the evaporation pan to increase the evaporation rate of the ammonia solution.

(vii) After two minutes a determination of the ammonia concentration within the chamber should be made using the high range colorimetric detector tube. A concentration of 1000 ppm ammonia or greater shall be generated before the exercises are started.

(viii) To test the integrity of the suit the following four minute exercise protocol should be followed:

(A) Raising the arms above the head with at least fifteen raising motions completed in one minute.

(B) Walking in place for one minute with at least fifteen raising motions of each leg in a one-minute period.

(C) Touching the toes with at least ten complete motions of the arms from above the head to touching of the toes in a one-minute period.

(D) Knee bends with at least ten complete standing and squatting motions in a one-minute period.

(ix) At any time during the test the colorimetric indicating paper should change colors the test should be stopped and (f)(x) and (xi) of this subsection initiated.

(x) After completion of the test exercise, the test area concentration should be measured again using the high range colorimetric detector tube.

(xi) Exit the test area.

(xii) The opening created by the suit zipper or other appropriate suit penetration should be used to determine the ammonia concentration in the suit with the low range length of stain detector tube or other ammonia monitor. The internal TECP suit air should be sampled far enough from the enclosed test area to prevent a false ammonia reading.

(xiii) After completion of the measurement of the suit interior ammonia concentration the test is concluded and the suit is doffed and the respirator removed.

(xiv) The ventilating fan for the test room should be turned on and allowed to run for enough time to remove the ammonia gas. The fan shall be vented to the outside of the building.

(xv) Any detectable ammonia in the suit interior (5 ppm ammonia (NH₃) or more for the length of stain detector tube) indicates the suit failed the test. When other ammonia detectors are used, a lower level of detection is possible and it should be specified as the pass/fail criteria.

(xvi) By following this test method an intrusion coefficient of approximately two hundred or more can be measured with the suit in a completely operational condition.

(g) Retest procedures.

(i) If the suit fails this test check for leaks by following the pressure test in test "A" above.

(ii) Retest the TECP suit as outlined in (f) of this subsection, Test procedure.

(h) Report.

(i) Each gas tight totally-encapsulating chemical protective suit tested by this practice shall have the following information recorded.

(A) Unique identification number identifying brand name, date of purchase, material of construction, and unique suit features; e.g., special breathing apparatus.

(B) General description of test room used for test.

(C) Brand name and purchase date of ammonia detector strips and color change data.

(D) Brand name, sampling range, and expiration date of the length of stain ammonia detector tubes. The brand name and model of the sampling pump should also be recorded. If another type of ammonia detector is used, it should be identified along with its minimum detection limit for ammonia.

(E) Actual test results shall list the two test area concentrations, their average, the interior suit concentration, and the calculated intrusion coefficient. Retest data shall be recorded as an additional test.

(ii) The evaluation of the data shall be specified as "suit passed" or "suit failed" and the date of the test. Any detectable ammonia (5 ppm or greater for the length of stain detector tube) in the suit interior indicates the suit fails this test. When other ammonia detectors are used, a lower level of detection is possible and it should be specified as the pass/fail criteria.

Caution. Visually inspect all parts of the suit to be sure they are positioned correctly and secured tightly before putting the suit back into service. Special care should be taken to examine each exhaust valve to make sure it is not blocked.

Care should also be exercised to assure that the inside and outside of the suit is completely dry before it is put into storage.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-3160, filed 10/6/88, effective 11/7/88.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

WAC 296-62-3170 Appendix B--General description and discussion of the levels of protection and protective gear. This appendix sets forth information about personal protective equipment (PPE) protection levels which may be used to assist employers in complying with the PPE requirements of this section.

(1) As required by the standard, PPE must be selected which will protect employees from the specific hazards which they are likely to encounter during their work on-site.

(a) Selection of the appropriate PPE is a complex process which must take into consideration a variety of factors. Key factors involved in this process are identification of the hazards or suspected hazards, their routes of potential hazard to employees (inhalation, skin absorption, ingestion, and eye or skin contact), and the performance of the PPE materials (and seams) in providing a barrier to these hazards. The amount of protection provided by PPE is material-hazard specific. That is, protective equipment materials will protect well against some hazardous substances and poorly, or not at all, against others. In many instances, protective equipment materials cannot be found which will provide continuous protection from the particular hazardous substance. In these cases the breakthrough time of the protective material should exceed the work durations, or the exposure after breakthrough must not pose a hazardous level.

(b) Other factors in this selection process to be considered are matching the PPE to the employee's work requirements and task-specific conditions. The durability of PPE materials, such as tear strength and seam strength, must be considered in relation to the employee's tasks. The effects of PPE in relation to heat stress and task duration are a factor in selecting and using PPE. In some cases layers of PPE may be necessary to provide sufficient protection, or to protect expensive PPE inner garments, suits or equipment.

(c) The more that is known about the hazards at the site, the easier the job of PPE selection becomes. As more information about the hazards and conditions at the site becomes available, the site supervisor can make decisions to up-grade or down-grade the level of PPE protection to match the tasks at hand.

(2) The following are guidelines which an employer can use to begin the selection of the appropriate PPE. As noted above, the site information may suggest the use of combinations of PPE selected from the different protection levels (i.e., A, B, C, or D) as being more suitable to the hazards of the work. It should be cautioned that the listing below does not fully address the performance of the specific PPE material in relation to the specific hazards at the job site, and that PPE selection, evaluation

and reselection is an ongoing process until sufficient information about the hazards and PPE performance is obtained.

(a) Personal protective equipment has been divided into four categories based on the degree of protection afforded (see (b) of this subsection for further explanation of Levels A, B, C, and D hazards):

(i) Level A. To be selected when the greatest level of skin, respiratory, and eye protection is required. Level A equipment, used as appropriate. The following constitute Level A equipment; it may be used as appropriate:

(A) Pressure-demand, full-facepiece self-contained breathing apparatus (SCBA), or pressure-demand supplied-air respirator with escape SCBA, approved by the National Institute for Occupational Safety and Health (NIOSH).

(B) Totally-encapsulating chemical-protective suit.

(C) Coveralls.*

(D) Long underwear.*

(E) Gloves, outer, chemical-resistant.

(F) Gloves, inner, chemical-resistant.

(G) Boots, outer, chemical-resistant steel toe and shank.

(H) Hard hat (under suit).*

(I) Disposable protective suit, gloves, and boots. (Depending on suit construction, may be worn over totally-encapsulating suit.)

(J) Two-way radios (worn inside encapsulating suit).

*Optional, as applicable.

(ii) Level B. The highest level of respiratory protection is necessary but a lesser level of skin protection is needed. The following constitute Level B equipment; it may be used as appropriate:

(A) Pressure-demand, full-facepiece self-contained breathing apparatus (SCBA), or pressure-demand supplied-air respirator with escape SCBA (NIOSH approved).

(B) Hooded chemical-resistant clothing (overalls and long-sleeved jacket, coveralls, one or two-piece chemical-splash suit, disposable chemical-resistant overalls).

(C) Coveralls.*

(D) Gloves, outer, chemical-resistant.

(E) Gloves, inner, chemical-resistant.

(F) Boots, outer, chemical-resistant steel toe and shank.

(G) Boot-covers, outer, chemical-resistant (disposable).*

(H) Hard hat.

(I) Two-way radios (worn inside encapsulating suit).

(J) Face shield.*

*Optional, as applicable.

(iii) Level C. The concentration(s) and type(s) of airborne substance(s) is/are known and the criteria for using air purifying respirators are met. The following constitute Level C equipment; it may be used as appropriate.

(A) Full-face or half-mask, air purifying, canister equipped respirators (NIOSH approved).

(B) Hooded chemical-resistant clothing (overalls; two-piece chemical-splash suit; disposable chemical-resistant overalls).

(C) Coveralls.*

(D) Gloves, outer, chemical-resistant.

(E) Gloves, inner, chemical-resistant.

(F) Boots (outer), chemical-resistant steel toe and shank.*

(G) Boot-covers, outer, chemical-resistant (disposable).*

(H) Hard hat.

(I) Escape mask.*

(J) Two-way radios (worn under outside protective clothing).

(K) Face shield.*

*Optional, as applicable.

(iv) Level D. A work uniform affording minimal protection: Used for nuisance contamination only. The following constitute Level D equipment; it may be used as appropriate.

(A) Coveralls.

(B) Gloves.*

(C) Boots/shoes, chemical-resistant steel toe and shank.

(D) Boots, outer, chemical-resistant (disposable).*

(E) Safety glasses or chemical splash goggles.*

(F) Hard hat.

(G) Escape mask.*

(H) Face shield.*

*Optional, as applicable.

(b) Part B. The types of hazards for which Levels A, B, C, and D protection are appropriate are described below:

(i) Level A - Level A protection should be used when:

(A) The hazardous substance has been identified and requires the highest level of protection for skin, eyes, and the respiratory system based on either the measured (or potential for) high concentration of atmospheric vapors, gases, or particulates; or the site operations and work functions involve a high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates of materials that are harmful to skin or capable of being absorbed through the intact skin;

(B) Substances with a high degree of hazard to the skin are known or suspected to be present, and skin contact is possible; or

(C) Operations must be conducted in confined, poorly ventilated areas, and the absence of conditions requiring Level A have not yet been determined.

(ii) Level B protection should be used when:

(A) The type and atmospheric concentration of substances have been identified and require a high level of respiratory protection, but less skin protection;

Note: This involves atmospheres with IDLH concentrations of specific substances that do not represent a severe skin hazard; or that do not meet the criteria for use of air-purifying respirators.

(B) The atmosphere contains less than 19.5 percent oxygen; or

(C) The presence of incompletely identified vapors or gases is indicated by a direct-reading organic vapor detection instrument, but vapors and gases are not suspected of containing high levels of chemicals harmful to skin or capable of being absorbed through the intact skin.

(iii) Level C protection should be used when:

(A) The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect or be absorbed through any exposed skin;

(B) The types of air contaminants have been identified, concentrations measured, and an air-purifying respirator is available that can remove the contaminants; and

(C) All criteria for the use of air-purifying respirators are met.

(iv) Level D protection should be used when:

(A) The atmosphere contains no known hazard; and

(B) Work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals.

Note: As stated before combinations of personal protective equipment other than those described for Levels A, B, C, and D protection may be more appropriate and may be used to provide the proper level of protection.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-3170, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3180 Appendix C--Compliance guidelines. (1) Occupational safety and health program. Each hazardous waste site clean-up effort will require an occupational safety and health program headed by the site coordinator or the employer's representative. The program will be designed for the protection of employees at the site. The purpose of the program will need to be developed before work begins on the site and implemented as work proceeds. The program is to facilitate coordination and communication among personnel responsible for the various activities which will take place at the site. It will provide the overall means for planning and implementing the needed safety and health training and job orientation of employees who will be working at the site. The program will provide the means for identifying and controlling worksite hazards and the means for monitoring program effectiveness. The program will need to cover the responsibilities and authority of the site coordinator or the employer's manager on the site for the safety and health of employees at the site, and the relationships with contractors or support services as to what each employer's safety and health responsibilities are for their employees on the site. Each contractor on the site needs to have its own safety and health program so structured that it will smoothly interface with the program of the site coordinator. Also those employers involved with treating, storing, or disposal of hazardous waste as covered in WAC 296-62-3140 must have implemented a safety and health plan for their employees. This program is to include the hazard communication program required in WAC 296-62-3140(1) and the training required in WAC 296-62-3140(5) as parts of

the employers comprehensive overall safety and health program. This program is to be in writing.

(a) Each site or workplace safety and health program will need to include the following:

(i) Policy statements of the line of authority and accountability for implementing the program, the objectives of the program and the role of the site safety and health officer or manager and staff;

(ii) Means or methods for the development of procedures for identifying and controlling workplace hazards at the site;

(iii) Means or methods for the development and communication to employees of the various plans, work rules, standard operating procedures and practices that pertain to individual employees and supervisors;

(iv) Means for the training of supervisors and employees to develop the needed skills and knowledge to perform their work in a safe and healthful manner;

(v) Means to anticipate and prepare for emergency situations; and

(vi) Means for obtaining information feedback to aid in evaluating the program and for improving the effectiveness of the program. The management and employees should be trying continually to improve the effectiveness of the program thereby enhancing the protection being afforded those working on the site.

(b) Accidents on the site should be investigated to provide information on how such occurrences can be avoided in the future. When injuries or illnesses occur on the site or workplace, they will need to be investigated to determine what needs to be done to prevent this incident from occurring again. Such information will need to be used as feedback on the effectiveness of the program and the information turned into positive steps to prevent any reoccurrence. Receipt of employee suggestions or complaints relating to safety and health issues involved with site or workplace activities is also a feedback mechanism that needs to be used effectively to improve the program and may serve in part as an evaluative tool(s).

(2) Training.

(a) The employer is encouraged to utilize those training programs that have been recognized by the National Institute of Environmental Health Sciences through its training grants program. These training and educational programs are being developed for the employees who work directly with hazardous substances. For further information about these programs contact: National Institute of Environmental Health Sciences, P.O. Box 12233, Research Triangle Park, NC 27709.

(b) The training programs for employees subject to the requirements of WAC 296-62-3040 are expected to address: The safety and health hazards employees should expect to find on sites; what control measures or techniques are effective for those hazards; what monitoring procedures are effective in characterizing exposure levels; what makes an effective employer's safety and health program; what a site safety and health plan should include; and employee's responsibilities under WISHA and other regulations. Supervisors will need training in their responsibilities under the safety and health program and its subject areas such as the spill

containment program, the personal protective equipment program, the medical surveillance program, the emergency response plan and other areas.

(c) Training programs for emergency service organizations are available from the United States National Fire Academy, Emmitsburg, MD and the various state fire training schools. The International Society of Fire Service Instructors, Ashland, MA is another resource.

(d) The training programs for employees covered by the requirements of WAC 296-62-3110(3) are expected to address: The need for and use of personal protective equipment including respirators; the decontamination procedures to be used; preplanning activities for hazardous substance incidents including the emergency response plan; company standard operating procedures for hazardous substance emergency responses; the use of the incident command system and other subjects. Hands-on training should be stressed whenever possible. Critiques done after an incident which include any evaluation of what worked, and what did not, and how can we do better the next time, may be counted as training time.

(e) For hazardous materials teams, the training will need to address the care, use and/or testing of chemical protective clothing including totally encapsulating suits, the medical surveillance program, the standard operating procedures for the use of plugging and patching equipment and other subject areas.

(f) Officers and leaders who may be expected to be in charge at an incident will need to be fully knowledgeable of their company's incident command system. They will need to know where and how to obtain additional assistance and be familiar with the local district's emergency response plan.

(g) Technical experts or medical experts or environmental experts that work with hazardous materials in their regular jobs, who may be sent to the incident scene by the shipper, manufacturer or governmental agency to advise and assist the person in charge of the incident need not have monthly training sessions, however, they will be required to have the twenty-four hours of training on an annual basis. Their training must include the care and use of personal protective equipment including respirators; knowledge of the incident command system; and those areas needed to keep them current in their respective field as it relates to safety and health involving specific hazardous substances.

(h) Those employees who work for public works departments or special equipment operators who operate bulldozers, sand trucks, backhoes, etc., who may be called to the incident scene to provide emergency support assistance, will need at least a safety and health briefing before entering the area of potential or actual exposure. These specially skilled persons, who have not been a part of the emergency plan and do not meet the required training hours, must be made aware of the hazards they face and be provided all necessary protective clothing and equipment required for their tasks. If respirators are to be worn, the specially skilled person shall be trained in accordance with WAC 296-62-071 through 296-62-07121 before proceeding into the hazardous area to do their assigned job.

(3) Decontamination. Decontamination procedures should be tailored to the specific hazards of the site and will vary in complexity, and number of steps, depending on the level of hazard and the employee's exposure to the hazard. Decontamination procedures and PPE decontamination methods will vary depending upon the specific substance, since one procedure or method will not work for all substances. Evaluation of decontamination methods and procedures should be performed, as necessary, to assure that employees are not exposed to hazards by reusing PPE. References in WAC 296-62-3190, Appendix D, may be used for guidance in establishing an effective decontamination program.

(4) Emergency response plans. States, along with designated districts within the states, will be developing or have developed emergency response plans. These district and state plans are to be utilized in the emergency response plans called for in this standard. Each employer needs to assure that its emergency response plan is compatible with the local plan. In addition, the chemical manufacturers' association (CMA) is another helpful resource in formulating an effective emergency response plan. Also the current Emergency Response Guidebook from the United States Department of Transportation, CMA's CHEMTREC and the Fire Service Emergency Management Handbook should be used as resources.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-3180, filed 10/6/88, effective 11/7/88.]

WAC 296-62-3190 Appendix D--References. The following references may be consulted for further information on the subject of this notice:

(1) *WISHA Guidelines for Superfund and Other Hazardous Waste Site Activities*, W.R.D. 84-13 as amended, October 24, 1986.

(2) *WISHA Hazardous Waste Activity Form*, July 1986, *WISHA Form F413-016-000*.

(3) *Hazardous Waste Inspections Reference Manual*, U.S. Department of Labor, Occupational Safety and Health Administration, 1986.

(4) *Memorandum of Understanding Among the National Institute for Occupational Safety and Health, the Occupational Safety and Health Administration, the United States Coast Guard, and the United States Environmental Protection Agency; Guidance for Worker Protection During Hazardous Waste Site Investigations and Clean-up and Hazardous Substance Emergencies*, December 18, 1980.

(5) *National Priorities List, 1st Edition*, October 1984; U.S. Environmental Protection Agency, Revised periodically.

(6) *The Decontamination of Response Personnel, Field Standard Operating Procedures (F.S.O.P.) 7*; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, December 1984.

(7) *Preparation of a Site Safety Plan, Field Standard Operating Procedures (F.S.O.P.) 9*; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, April 1985.

(8) *Standard Operating Safety Guidelines*; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, Environmental Response Team; November 1984.

(9) *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, National Institute for Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA), U.S. Coast Guard (USCG), and Environmental Protection Agency (EPA); October 1985.

(10) *Protecting Health and Safety at Hazardous Waste Sites: An Overview*, U.S. Environmental Protection Agency, EPA/625/9-85/006; September 1985.

(11) *Hazardous Waste Sites and Hazardous Substance Emergencies*, NIOSH Worker Bulletin, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; December 1982.

(12) *Personal Protective Equipment for Hazardous Materials Incidents: A Selection Guide*; U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; October 1984.

(13) *Fire Service Emergency Management Handbook*, International Association of Fire Chiefs Foundation, 101 East Holly Avenue, Unit 10B, Sterling, VA 22170, January 1985.

(14) *Emergency Response Guidebook*, U.S. Department of Transportation, Washington, D.C., 1983.

(15) *Report to the Congress on Hazardous Materials Training, Planning and Preparedness*, Federal Emergency Management Agency, Washington, DC, July 1986.

(16) *Workbook for Fire Command*, Alan V. Brunacini and J. David Beageron, National Fire Protection Association, Batterymarch Park, Quincy, MA 02269, 1985.

(17) *Fire Command*, Alan V. Brunacini, National Fire Protection, Batterymarch Park, Quincy, MA 02269, 1985.

(18) *Incident Command System, Fire Protection Publications*, Oklahoma State University, Stillwater, OK 74078, 1983.

(19) *Site Emergency Response Planning*, Chemical Manufacturers Association, Washington, DC 20037, 1986.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-3190, filed 10/6/88, effective 11/7/88.]

Chapter 296-65 WAC

ASBESTOS REMOVAL AND ENCAPSULATION

WAC

296-65-003	Definitions.
296-65-005	Training course content.
296-65-015	Training course certification.
296-65-020	Notification requirements.
296-65-025	Certificate fee.
296-65-030	Methods of compliance.
296-65-040	Repealed.
296-65-045	Repealed.

(3) Decontamination. Decontamination procedures should be tailored to the specific hazards of the site and will vary in complexity, and number of steps, depending on the level of hazard and the employee's exposure to the hazard. Decontamination procedures and PPE decontamination methods will vary depending upon the specific substance, since one procedure or method will not work for all substances. Evaluation of decontamination methods and procedures should be performed, as necessary, to assure that employees are not exposed to hazards by reusing PPE. References in WAC 296-62-3190, Appendix D, may be used for guidance in establishing an effective decontamination program.

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[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-3180, filed 10/6/88, effective 11/7/88.]

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(4) *Memorandum of Understanding Among the National Institute for Occupational Safety and Health, the Occupational Safety and Health Administration, the United States Coast Guard, and the United States Environmental Protection Agency; Guidance for Worker Protection During Hazardous Waste Site Investigations and Clean-up and Hazardous Substance Emergencies*, December 18, 1980.

(5) *National Priorities List, 1st Edition*, October 1984; U.S. Environmental Protection Agency, Revised periodically.

(6) *The Decontamination of Response Personnel, Field Standard Operating Procedures (F.S.O.P.) 7*; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, December 1984.

(7) *Preparation of a Site Safety Plan, Field Standard Operating Procedures (F.S.O.P.) 9*; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, April 1985.

(8) *Standard Operating Safety Guidelines*; U.S. Environmental Protection Agency, Office of Emergency and Remedial Response, Hazardous Response Support Division, Environmental Response Team; November 1984.

(9) *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, National Institute for Occupational Safety and Health (NIOSH), Occupational Safety and Health Administration (OSHA), U.S. Coast Guard (USCG), and Environmental Protection Agency (EPA); October 1985.

(10) *Protecting Health and Safety at Hazardous Waste Sites: An Overview*, U.S. Environmental Protection Agency, EPA/625/9-85/006; September 1985.

(11) *Hazardous Waste Sites and Hazardous Substance Emergencies*, NIOSH Worker Bulletin, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; December 1982.

(12) *Personal Protective Equipment for Hazardous Materials Incidents: A Selection Guide*; U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, National Institute for Occupational Safety and Health; October 1984.

(13) *Fire Service Emergency Management Handbook*, International Association of Fire Chiefs Foundation, 101 East Holly Avenue, Unit 10B, Sterling, VA 22170, January 1985.

(14) *Emergency Response Guidebook*, U.S. Department of Transportation, Washington, D.C., 1983.

(15) *Report to the Congress on Hazardous Materials Training, Planning and Preparedness*, Federal Emergency Management Agency, Washington, DC, July 1986.

(16) *Workbook for Fire Command*, Alan V. Brunacini and J. David Beageron, National Fire Protection Association, Batterymarch Park, Quincy, MA 02269, 1985.

(17) *Fire Command*, Alan V. Brunacini, National Fire Protection, Batterymarch Park, Quincy, MA 02269, 1985.

(18) *Incident Command System, Fire Protection Publications*, Oklahoma State University, Stillwater, OK 74078, 1983.

(19) *Site Emergency Response Planning*, Chemical Manufacturers Association, Washington, DC 20037, 1986.

[Statutory Authority: Chapter 49.17 RCW. 88-21-002 (Order 88-23), § 296-62-3190, filed 10/6/88, effective 11/7/88.]

Chapter 296-65 WAC

ASBESTOS REMOVAL AND ENCAPSULATION

WAC

296-65-003	Definitions.
296-65-005	Training course content.
296-65-015	Training course certification.
296-65-020	Notification requirements.
296-65-025	Certificate fee.
296-65-030	Methods of compliance.
296-65-040	Repealed.
296-65-045	Repealed.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

- 296-65-040 Appeals—Notice and filing. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-65-040, filed 4/27/87. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-040, filed 10/22/85.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-65-045 Appeals—Procedure. [Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-045, filed 10/22/85.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.

WAC 296-65-003 Definitions. Unless the context clearly requires otherwise, the definitions in this section apply throughout this chapter.

- (1) "Approved" means approved by the department.
- (2) "Asbestos" includes different forms of chrysotile, amosite, crocidolite, tremolite, anthophyllite and actinolite.
- (3) "Asbestos fiber" means asbestos fiber as defined in WAC 296-62-07703.
- (4) "Asbestos project" includes the construction, demolition, repair, maintenance or renovation of any public or private building or structure, mechanical piping equipment or system involving the demolition, removal, encapsulation, salvage, or disposal of material releasing or likely to release asbestos fibers into the air.
- (5) "Auxiliary project" means a work activity which does not directly involve an asbestos project but which may disturb or expose asbestos or asbestos-containing materials.
- (6) "Certificate" means the certificate issued by the department.
- (7) "Certified asbestos worker" means an individual who has successfully completed an approved asbestos training course and has received the certificate.
- (8) "Contractor" includes any partnership, firm, association, corporation or sole proprietorship that contracts to perform the removal or encapsulation of asbestos.
- (9) "Department" means the department of labor and industries.
- (10) "Demolition" includes the wrecking or removal of any load-supporting structural member of a facility including any related handling operations.
- (11) "Direct on-site supervision" means the supervision of no more than three workers by a certified asbestos worker who is physically present at all times at the asbestos project. It includes the authority to immediately correct any deficiencies on the project.
- (12) "Encapsulation" means the application of an encapsulant to asbestos containing materials to control the release of asbestos fibers into the air. The encapsulant creates a membrane over the surface (bridging encapsulant) or penetrates the material and binds its components together (penetrating encapsulant).
- (13) "HEPA filtration" means high efficiency particulate air filtration found in respirators and vacuum systems capable of filtering 0.3 micron particles with 99.97% efficiency.

(14) "NESHAP" means the National Emission Standards for Hazardous Air Pollutants.

(15) "Person" means any partnership, firm, association, corporation, sole proprietorship or the state of Washington or its political subdivisions.

(16) "Removal" includes the stripping of any asbestos containing materials from the surface or components of a facility.

(17) "Renovation" includes altering in any way one or more facility components. Operations in which load-supporting structural members are wrecked or removed are excluded.

(18) "Repair" includes the restoration of asbestos containing insulation that has been damaged, usually located on pipes, boilers, tanks, turbines, ducts or other facility components. Repair usually consists of the application of duct tape, rewettable glass cloth, canvas, cement or other suitable material to seal exposed areas where asbestos fibers may be released. Repair of previously encapsulated asbestos containing materials may involve filling damaged areas with nonasbestos substitutes and reencapsulating. Repair of enclosures around asbestos containing materials is contemplated by this term.

(19) "Structural component" includes any pipe, duct, boiler, tank, reactor, turbine or furnace at or in a facility or any structural member of a facility.

(20) "Structural member" means any load-supporting or non-load-supporting member of a facility such as beams, walls, and ceilings.

(21) "Structure" means an entire facility, building or major portion thereof, such as a building wing.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-65-003, filed 11/30/87. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-003, filed 10/22/85.]

WAC 296-65-005 Training course content. An approved basic asbestos course shall consist of at least thirty hours of training. The initial training course shall provide, at a minimum, information on the following topics:

(1) The physical characteristics of asbestos including types, fiber size, aerodynamic characteristics and physical appearance.

(2) Examples of different types of asbestos and asbestos containing materials. Real asbestos shall be used only for observation by trainees and shall be enclosed in sealed unbreakable containers.

(3) The health hazards of asbestos including the nature of asbestos related diseases, routes of exposure, dose-response relationships, synergism between cigarette smoking and asbestos exposure, latency period of diseases, hazards to immediate family, and the health basis for asbestos standards.

(4) Employee personal protective equipment including the classes and characteristics of respirator types, limitations of respirators, proper selection, inspection, donning, use, maintenance and storage procedure, methods for field checking of the facepiece-to-face seal (positive and negative pressure checks), qualitative and

quantitative fit testing procedures, variability between field and laboratory protection factors, factors that alter respirator fit (e.g., eye glasses and facial hair), the components of a proper respiratory protection program, respirator program administrator, requirements on oil lubricated reciprocating piston compressors for breathing air, and selection and use of personal protective clothing.

(5) Use, storage and handling of launderable clothing, nonslip footwear, gloves, eye protection and hard hats.

(6) Medical monitoring procedures and requirements, including the provisions of WAC 296-62-071 through 296-62-07121 and 296-62-07725, any additional recommended procedures and tests, benefits of medical monitoring and employee access to records.

(7) Air monitoring procedures and requirements specified in WAC 296-62-07709, including a description of equipment, sampling methods and strategies, reasons for air monitoring, types of samples, including area, personal and clearance samples, current standards with proposed changes if any, employee observation and notification, recordkeeping and employee access to records, interpretation of air monitoring results, and analytical methods for bulk and air samples.

(8) State-of-the-art work practices for asbestos removal and encapsulation activities including purpose, proper construction and maintenance of barriers and decontamination enclosure systems, posting of warning signs, electrical and ventilation system lock-out, proper working techniques and tools with vacuum attachments for minimizing fiber release, use of wet methods and surfactants, use of negative pressure ventilation equipment for minimizing employee exposure to asbestos fibers and contamination prevention, scoring and breaking techniques for rigid asbestos products, glove bag techniques, use of HEPA vacuums and proper clean-up and disposal procedures. Work practice requirements for removal, encapsulation, enclosure and repair shall be discussed individually. Appropriate work practices for both indoor and outdoor asbestos projects shall be included.

(9) Personal hygiene including entry and exit procedures for the work area, use of showers and prohibition of eating, drinking, smoking and chewing (gum or tobacco) in the work area.

(10) Additional safety hazards that may be encountered during asbestos removal and encapsulation activities and hazard abatement; including electrical hazards, scaffold and ladder hazards, slips, trips and falls, confined spaces, noise, and heat stress.

(11) The requirements, procedures and standards established by:

(a) The Environmental Protection Agency, 40 CFR Part 61, Subparts A and M.

(b) Washington state department of ecology.

(c) Local air pollution control agencies.

(d) Washington state department of labor and industries, division of industrial safety and health, chapter 49.17 RCW (Washington Industrial Safety and Health Act), chapter 49.17 RCW (Health and safety—Asbestos), and ensuing regulations.

(12) Actual worksite considerations.

(13) The instruction required by this section shall include, at a minimum, hands-on training for the following:

(a) Glove bag techniques;

(b) The opportunity to don respirators including half facepiece and full facepiece air purifying respirators, powered air purifying respirators (PAPR), and Type-C supplied-air respirators. Qualitative or quantitative fit testing shall be performed on each student in accordance with WAC 296-62-07715 and 296-62-07739;

(c) Removal and repair of sprayed-on material, troweled-on material and pipe lagging;

(d) Basic construction of a decontamination unit, and proper entry and exit;

(e) Suit-up in protective clothing consisting of coveralls, foot coverings and head coverings.

(14) Asbestos containing materials shall not be used for hands-on training.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-65-005, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-65-005, filed 4/27/87. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-005, filed 10/22/85.]

WAC 296-65-015 Training course certification.

Basic and refresher asbestos training courses may be provided by any person, environmental health consulting firm, union, trade association, educational institution, public health organization, individual, governmental agency, or other entity.

(1) Each course shall be evaluated by the department for the breadth of knowledge and experience required to properly train asbestos workers. Course content shall be carefully scrutinized for adequacy and accuracy. Training techniques will be evaluated by the department.

(2) Sponsors of basic and refresher training courses proposed for approval must submit:

(a) Background information about course sponsors;

(b) Course locations and fees;

(c) Copies of course handouts;

(d) A detailed description of course content and the amount of time allotted to each major topic;

(e) A description of teaching methods to be utilized and a list of all audio-visual materials; the department may, in its discretion, request that copies of the materials be provided for review. Any audio-visual materials provided to the department will be returned to the applicant;

(f) A list of all personnel involved in course preparation and presentation and a description of the background, special training and qualifications of each;

(g) A description of student evaluation methods and a copy of the required written examination including the scoring methodology to be used in grading the examination;

(h) A description of course evaluation methods; and

(i) Any restrictions on attendance (language, class size, affiliation, etc.).

(3) Application for training course approval and course materials shall be submitted to the department at

least forty-five days prior to the requested approval date. Materials may be mailed to:

Asbestos Certification Program
Department of Labor and
Industries, HC-412
805 Plum Street S.E.
P.O. Box 207
Olympia, Washington 98504

(4) Upon approval of a basic or refresher asbestos training course, the department will issue the course sponsor a certificate. The certificate is valid for one year from the date of issuance. Application for renewal must follow the procedures described in subsections (2) and (3) of this section.

(5) To be considered timely, the training course certificate renewal must be received by the department no later than sixty days after the certificate expiration date.

(6) Any changes to a training course must be approved by the department in advance.

(7) The course sponsor shall provide the department with a list of all persons who have completed a basic or refresher training course. The list must be provided no later than ten days after a course is completed and must include the name and address of each trainee.

(8) The course sponsor must notify the department at least one week before a training course is scheduled to begin. The notification must include the date, time and address where the training will be conducted.

(9) A representative of the department may, at the department's discretion, attend a training course as an observer to verify that the training course is conducted in accordance with the program approved by the department.

(10) The department may suspend or revoke the certification of a training course if its sponsor fails to maintain the course content and quality as initially approved.

(11) The training course sponsor shall limit each class to a maximum of thirty participants.

(12) The instructor to student ratio shall not exceed one-to-ten for any of the training required by WAC 296-65-005(13).

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-65-015, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-65-015, filed 4/27/87. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-015, filed 10/22/85.]

WAC 296-65-020 Notification requirements. A copy of any notice of intention to demolish or renovate a facility required to be filed with a federal, state, or local air pollution control agency shall be sent directly to the department by each person whose employees, if any, are renovating or demolishing any structure. Notices must be received within the same time periods required by the federal, state, or local agency and may be mailed to:

Asbestos Certification Program
Department of Labor and
Industries, HC-412
805 Plum Street S.E.
P.O. Box 207
Olympia, Washington 98504.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-65-020, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-65-020, filed 4/27/87. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-020, filed 10/22/85.]

WAC 296-65-025 Certificate fee. (1) A nonrefundable administrative fee of twenty-five dollars shall be assessed for each initial or renewal certificate application. The fee (check or money order) must accompany the certificate application and be made payable to the department. An application form may be obtained from any approved training course instructor or directly from the department.

(2) A nonrefundable administrative fee of one hundred fifty dollars shall be assessed for each initial or renewal application for training course approval. A check or money order shall accompany any application made under the provisions of WAC 296-65-015 and be made payable to the department.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-65-025, filed 11/30/87. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-025, filed 10/22/85.]

WAC 296-65-030 Methods of compliance. (1) No contractor, employee, or other individual is eligible to work on an asbestos project unless properly issued a certificate by the department, except in the case of an asbestos project undertaken by any partnership, firm, corporation or sole proprietorship in its own facility and by its own employees under the direct on-site supervision of a certified asbestos worker.

Note: This exception does not apply to the state of Washington or its political subdivisions.

(2) No person may assign any employee, contract with or permit any individual or person to remove or encapsulate asbestos in any facility unless performed by a certified asbestos worker except in the case of an asbestos project undertaken by any partnership, firm, corporation or sole proprietorship in its own facility and by its own employees under the direct on-site supervision of a certified asbestos worker.

Note: This exception does not apply to the state of Washington or its political subdivisions.

(3)(a) In cases excepted under subsections (1) and (2) of this section, the partnership, firm, corporation or sole proprietorship shall annually submit a written description to the department which includes at least the following information:

(i) The kinds of asbestos projects expected to be undertaken during a period of time not to exceed one year from the date of submission;

(ii) The procedures to be used in undertaking asbestos projects;

(iii) Methods of compliance with chapters 296-62, 296-65, and 296-155 WAC;

(iv) Methods of compliance with any additional procedures required by law for the safe demolition, removal, encapsulation, salvage, and disposal of asbestos; and

(v) The name, address and certification number of the supervising certified asbestos worker.

(b) The written description required by this section shall be submitted to the department prior to commencement of work.

(4) A further written description must be submitted to the department prior to commencing a project, if during the one year period covered by the written description submitted to the department in accordance with WAC 296-65-030(3), previously unidentified or new asbestos projects are proposed.

(5) Written descriptions, shall be mailed to:

Asbestos Certification Program,
Department of Labor and
Industries, HC-412
805 Plum Street S.E.
P.O. Box 207
Olympia, Washington 98504.

[Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-65-030, filed 4/27/87. Statutory Authority: SSB 4209, 1985 c 387. 85-21-080 (Order 85-30), § 296-65-030, filed 10/22/85.]

WAC 296-65-040 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-65-045 Repealed. See Disposition Table at beginning of this chapter.

Chapter 296-78 WAC

SAFETY STANDARDS FOR SAWMILLS AND WOODWORKING OPERATIONS

WAC

296-78-56505 Boats and mechanical devices on waters.

WAC 296-78-56505 Boats and mechanical devices on waters. (1) Prior to starting the boat motor, any spilled fuel shall be removed and vapors shall be exhausted from any area in which they may accumulate.

(2) The bilge area shall be kept clean and oil, grease, fuel, or highly combustible materials shall not be allowed to accumulate.

(3) Adequate ventilation equipment shall be provided and used for the bilge area to prevent the accumulation of toxic or explosive gases or vapors.

(4) Adequate ventilation equipment shall be provided and used for the cabin area on enclosed cabin-type boats to prevent an accumulation of harmful gases or vapors.

(5) Deck and cabin lighting shall be provided and used where necessary to provide safe levels of illumination aboard boats. Boats operated during the period

from sunset to sunrise, or in conditions of restricted visibility, shall display navigation lights as required by the United States Coast Guard. Searchlights or floodlights shall be provided to facilitate safe navigation and to illuminate working or boarding areas adjacent to the craft.

(6) On craft used by workers wearing calked shoes, all areas where the operator or workers must stand or walk shall be made of or be covered with wood or other suitable matting or nonslip material and such covering shall be maintained in good condition.

(7) Each boat shall be provided with a fire extinguisher and life ring with at least fifty feet of one-fourth inch line attached. On log broncs, boom-scooters, or other small boomboats where all occupants are required to wear life saving devices and a life ring would present a tripping hazard, the life ring may be omitted.

(8)(a) Along docks, walkways, or other fixed installations on or adjacent to open water more than five feet deep, approved life rings with at least ninety feet of one-fourth inch line attached, shall be provided. The life rings shall be spaced at intervals not to exceed two hundred feet and shall be kept in easily visible and readily accessible locations.

(b) When employees are assigned work at other casual locations where exposure to drowning exists, at least one approved life ring with at least ninety feet of line attached, shall be provided in the immediate vicinity of the work assigned.

(c) When work is assigned over water where the vertical drop from the accidental fall would exceed fifty feet, special arrangements shall be made with and approved by the department of labor and industries prior to such assignment.

(d) Lines attached to life rings on fixed locations shall be at least ninety feet in length, at least one-fourth inch in diameter, and have a minimum breaking strength of five hundred pounds. Similar lines attached to life rings on boats shall be at least fifty feet in length.

(e) Life rings must be United States Coast Guard approved thirty-inch size.

(f) Life rings and attached lines shall be maintained to retain at least seventy-five percent of their designed buoyancy and strength.

(g) Log broncs, boom-scooters, and boomboats shall not be loaded with personnel or equipment so as to adversely affect their stability or seaworthiness.

(h) Boats shall not be operated at an excessive speed or handled recklessly.

(i) Boat fuel shall be transported and stored in approved containers. Refer to WAC 296-24-58501(19) for definition of approved.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-78-56505, filed 11/14/88. Statutory Authority: RCW 49.17.040, 49.17.050 and 49.17.240. 81-18-029 (Order 81-21), § 296-78-56505, filed 8/27/81.]

Chapter 296-81 WAC**SAFETY RULES GOVERNING EXISTING ELEVATORS, DUMBWAITERS, ESCALATORS AND OTHER LIFTING DEVICES--MOVING WALKS****WAC**

296-81-007	National Elevator Code adopted.
296-81-008	National Elevator Code supplement adopted.
296-81-275	Smoke detectors.
296-81-277	Method to achieve ANSI A17.1-102.2 (c)4.

WAC 296-81-007 National Elevator Code adopted.

(1) The American National Standard Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks, American National Standards Institute A17.1, as amended or revised through 1971, is adopted as the standards in this state for elevators, dumbwaiters, escalators, and moving walks installed from February 25, 1972, through June 30, 1982.

(2) The American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks, ANSI A17.1, 1981 edition, is adopted as the standard for elevators, dumbwaiters, escalators, and moving walks installed on or after July 1, 1982 through January 9, 1986.

(3) The American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks, ANSI A17.1, 1984 edition is adopted as the standard for elevators, dumbwaiters, escalators, and moving walks installed on or after January 10, 1986, with the exception of ANSI A17.1, part XIX. For all elevators, dumbwaiters, escalators, and moving walks installed on or after November 1, 1988, the requirements of ANSI A17.1, 1984 edition apply, with the exception of ANSI A17.1, part XIX and ANSI A17.1, part II, Rule 211.3b, which is replaced by WAC 296-81-275.

(4) The American National Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks, ANSI A17.1, 1987 edition is adopted as the standard for elevators, dumbwaiters, escalators, and moving walks installed on or after January 1, 1989, with the exception of ANSI A17.1, part XIX, and ANSI A17.1, part II, Rule 211.3b, which is replaced by WAC 296-81-275.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 88-19-053 (Order 88-18), § 296-81-007, filed 9/15/88. Statutory Authority: RCW 70.87.030. 87-23-007 (Order 87-21), § 296-81-007, filed 11/6/87. Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 86-03-024 (Order 86-1), § 296-81-007, filed 1/10/86. Statutory Authority: RCW 70.87.030 and 70.87.185. 84-23-001 (Order 84-21), § 296-81-007, filed 11/8/84. Statutory Authority: RCW 70.87.185 and 70.87.034. 84-05-005 (Order 83-37), § 296-81-007, filed 2/6/84. Statutory Authority: RCW 70.87.030. 82-12-005 (Order 82-18), § 296-81-007, filed 5/20/82; Order 72-2, § 296-81-007, filed 2/25/72.]

WAC 296-81-008 National Elevator Code supplement adopted.

(1) The American National Standard Supplement to Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks, A17.1-1971, ANSI A17.1a-1972 is hereby adopted as additional standards for compliance in this state for elevators, dumbwaiters, escalators, and moving walks installed from February 25, 1972, through June 30, 1982, and by this reference

such standards are incorporated herein as though fully set forth. Copies of this supplement may be obtained from The American Society of Mechanical Engineers, 345 East 47th Street, New York, New York 10017.

(2) The 1981 edition of ANSI A17.1 is supplemented by the ANSI A17.1a - 1982 supplement for elevators, dumbwaiters, escalators, and moving walks installed on or after March 1, 1984, through January 9, 1986. The 1981 edition of ANSI A17.1 and ANSI A17.1a - 1982 is supplemented by ANSI A17.1b - 1983 for elevators, dumbwaiters, escalators, and moving walks installed on or after December 1, 1984, through January 9, 1986, with the exception of portable escalators covered by Part VIII of ANSI A17.1b - 1983.

(3) The 1984 edition of ANSI A17.1 is supplemented by the ANSI A17.1a - 1985 supplement for elevators, dumbwaiters, escalators, and moving walks installed on or after January 10, 1986.

(4) The 1984 edition of ANSI A17.1 is supplemented by ANSI A17.1b - 1985, ANSI A17.1c - 1986, ANSI A17.1d - 1986, and ANSI A17.1e - 1987 for elevators, dumbwaiters, escalators, and moving walks installed on or after December 6, 1987.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 88-07-101 (Order 88-02), § 296-81-008, filed 3/23/88. Statutory Authority: RCW 70.87.030. 87-23-007 (Order 87-21), § 296-81-008, filed 11/6/87; 82-12-005 (Order 82-18), § 296-81-008, filed 5/20/82; Order 76-37, § 296-81-008, filed 12/3/76; Order 74-31, § 296-81-008, filed 6/14/74.]

WAC 296-81-275 Smoke detectors. Phase I recall shall be provided for all elevators with fully automatic open and close power operated doors, and shall be activated from, but not limited to, alarm devices in the elevator equipment room(s) and lobbies or areas adjacent to hoistways. Devices for deactivating recall shall be secure from tampering and shall be accessible to fire, inspection, and elevator service personnel only. Owner-designated patient express and emergency hospital service elevators may have a manual control in the car for use by authorized patient care personnel. When activated, it shall preclude Phase I recall.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 88-19-053 (Order 88-18), § 296-81-275, filed 9/15/88.]

WAC 296-81-277 Method to achieve ANSI A17.1-102.2 (c)4. ANSI A17.1-102.2 (c)4 regarding automatic sprinklers in hoistways and machine rooms states:

"Means shall be provided to automatically disconnect the mainline power supply to the affected elevator prior to the application of water."

Rule 102.2 (c)4 shall be accomplished in the following manner:

(1) Fixed temperature heat detector(s) (one hundred thirty-five degrees Fahrenheit) shall be provided at the top of the elevator hoistway and within the elevator equipment room to disconnect the mainline power of the elevator prior to the application of water from the sprinkler.

(2) Heat detectors shall be ceiling mounted and located within eighteen inches of each sprinkler head.

Heat detectors shall be an auxiliary function of the elevator equipment only and shall be identified "elevator control only - DO NOT TEST."

(3) Power for the automatic disconnect control circuit shall be derived from the load side of the elevator power main disconnecting means. The disconnect control device shall be located in the elevator equipment room and shall be easily identifiable.

(4) Automatic sprinkler heads installed in elevator pits do not require a power disconnect device but shall be installed in such a way that the water spray pattern shall not spray higher than three feet above the pit floor with a spray pattern directed level and down. A shut-off valve shall be provided.

Alternate methods to achieve ANSI A17.1-102.2 (c)4 must receive approval from the Washington state department of labor and industries elevator section prior to installation.

[Statutory Authority: RCW 70.87.080, 70.87.090 and 70.87.100. 88-24-022 (Order 88-27), § 296-81-277, filed 12/2/88.]

Chapter 296-99 WAC

SAFETY STANDARDS FOR GRAIN HANDLING FACILITIES

WAC

296-99-010	Scope.
296-99-015	Application.
296-99-020	Definitions.
296-99-025	Emergency action plan.
296-99-030	Training.
296-99-035	Hot work permit.
296-99-040	Entry into bins, silos, and tanks.
296-99-045	Contractors.
296-99-050	Housekeeping.
296-99-055	Grate openings.
296-99-060	Filter collectors.
296-99-065	Preventive maintenance.
296-99-070	Grain stream processing equipment.
296-99-075	Emergency escape.
296-99-080	Continuous-flow bulk raw grain dryers.
296-99-085	Inside bucket elevators.
296-99-090	Appendix A, grain handling facilities.
296-99-093	Appendix B, grain handling facilities.
296-99-095	Appendix C, grain handling facilities.

WAC 296-99-010 Scope. This section contains requirements for the control of grain dust fires and explosions, and certain other safety hazards associated with grain handling facilities. It applies in addition to all other relevant provisions of chapters 296-24 and 296-62 WAC (or chapter 296-56 WAC at marine terminals).

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-010, filed 11/14/88.]

WAC 296-99-015 Application. (1) WAC 296-99-010 through 296-99-070 apply to grain elevators, feed mills, flour mills, rice mills, dust pelletizing plants, dry corn mills, soybean flaking operations, and the dry grinding operations of soybean.

(2) WAC 296-99-075, 296-99-080, and 296-99-085 apply only to grain elevators.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-015, filed 11/14/88.]

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WAC 296-99-020 Definitions. (1) "Choked leg" means a condition of material buildup in the bucket elevator that results in the stoppage of material flow and bucket movement. A bucket elevator is not considered choked that has the up-leg partially or fully loaded and has the boot and discharge cleared allowing bucket movement.

(2) "Fugitive grain dust" means combustible dust particles, emitted from the stock handling system, of such size as will pass through a U.S. Standard 40 mesh sieve (425 microns or less).

(3) "Grain elevator" means a facility engaged in the receipt, handling, storage, and shipment of bulk raw agricultural commodities such as corn, wheat, oats, barley, sunflower seeds, and soybeans.

(4) "Hot work" means work involving electric or gas welding, cutting, brazing, or similar flame producing operations.

(5) "Inside bucket elevator" means a bucket elevator that has the boot and more than twenty percent of the total leg height (above grade or ground level) inside the grain elevator structure. Bucket elevators with leg casings that are inside (and pass through the roofs) of rail or truck dump sheds with the remainder of the leg outside of the grain elevator structure, are not considered inside bucket elevators.

(6) "Jogging" means repeated starting and stopping of drive motors in an attempt to clear choked legs.

(7) "Lagging" means a covering on drive pulleys used to increase the coefficient of friction between the pulley and the belt.

(8) "Permit" means the written certification by the employer authorizing employees to perform identified work operations subject to specified precautions.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-020, filed 11/14/88.]

WAC 296-99-025 Emergency action plan. The employer shall develop and implement an emergency action plan meeting the requirements contained in WAC 296-24-567.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-025, filed 11/14/88.]

WAC 296-99-030 Training. (1) The employer shall provide training to employees at least annually and when changes in job assignment will expose them to new hazards. Current employees, and new employees prior to starting work, shall be trained in at least the following:

(a) General safety precautions associated with the facility, including recognition and preventive measures for the hazards related to dust accumulations and common ignition sources such as smoking; and

(b) Specific procedures and safety practices applicable to their job tasks including but not limited to, cleaning procedures for grinding equipment, clearing procedures for choked legs, housekeeping procedures, hot work procedures, preventive maintenance procedures, and lock-out/tag-out procedures.

(2) Employees assigned special tasks, such as bin entry and handling of flammable or toxic substances, shall be provided training to perform these tasks safely.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-030, filed 11/14/88.]

WAC 296-99-035 Hot work permit. (1) The employer shall issue a permit for all hot work, with the following exceptions:

(a) Where the employer or the employer's representative (who would otherwise authorize the permit) is present while the hot work is being performed;

(b) In welding shops authorized by the employer;

(c) In hot work areas authorized by the employer which are located outside of the grain handling structure.

(2) The permit shall certify that the requirements contained in WAC 296-24-695 have been implemented prior to beginning the hot work operations. The permit shall be kept on file until completion of the hot work operations.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-035, filed 11/14/88.]

WAC 296-99-040 Entry into bins, silos, and tanks. This paragraph applies to employees entering bins, silos, or tanks. It does not apply to employees entering flat storage buildings or tanks where the diameter of such structures is greater than the height, unless entry is made from the top of the structure.

The following actions shall be taken before employees enter bins, silos, or tanks:

(1) The employer shall issue a permit for entering bins, silos, or tanks unless the employer or the employer's representative (who would otherwise authorize the permit) is present during the entire operation. The permit shall certify that the precautions contained in this section have been implemented prior to employees entering bins, silos, or tanks. The permit shall be kept on file until completion of the entry operations.

(2) All mechanical, electrical, hydraulic, and pneumatic equipment which present a danger to employees inside bins, silos, or tanks shall be disconnected, locked-out and tagged, blocked-off, or prevented from operating by other means or methods.

(3) The atmosphere within a bin, silo, or tank shall be tested for the presence of combustible gases, vapors, and toxic agents when the employer has reason to believe they may be present. Additionally, the atmosphere within a bin, silo, or tank shall be tested for oxygen content unless there is continuous natural air movement or continuous forced-air ventilation before and during the period employees are inside. If the oxygen level is less than nineteen and one-half percent, or if combustible gas or vapor is detected in excess of ten percent of the lower flammable limit, or if toxic agents are present in excess of the ceiling values listed in WAC 296-62-07515, or if toxic agents are present in concentrations that will cause health effects which prevent employees from effecting self-rescue or communication to obtain assistance, the following provisions apply.

(a) Ventilation shall be provided until the unsafe condition or conditions are eliminated, and the ventilation shall be continued as long as there is a possibility of recurrence of the unsafe condition while the bin, silo, or tank is occupied by employees.

(b) If toxicity or oxygen deficiency cannot be eliminated by ventilation, employees entering the bin, silo, or tank shall wear an appropriate respirator. Respirator use shall be in accordance with the requirements of WAC 296-62-071 through 296-62-07121.

(4) When entering bins, silos, or tanks from the top, employees shall wear a body harness with lifeline, or use a boatswain's chair that meets the requirements of Part J-1 of chapter 296-24 WAC.

(5) An observer, equipped to provide assistance, shall be stationed outside the bin, silo, or tank being entered by an employee. Communications (visual, voice, or signal line) shall be maintained between the observer and employee entering the bin, silo, or tank.

(6) The employer shall provide equipment for rescue operations which is specifically suited for the bin, silo, or tank being entered.

(7) The employee acting as observer shall be trained in rescue procedures, including notification methods for obtaining additional assistance.

(8) Employees shall not enter bins, silos, or tanks underneath a bridging condition, or where a buildup of grain products on the sides could fall and bury them.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-040, filed 11/14/88.]

WAC 296-99-045 Contractors. (1) The employer shall inform contractors performing work at the grain handling facility of known potential fire and explosion hazards related to the contractor's work and work area. The employer shall also inform contractors of the applicable safety rules of the facility.

(2) The employer shall explain the applicable provisions of the emergency action plan to contractors.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-045, filed 11/14/88.]

WAC 296-99-050 Housekeeping. (1) The employer shall develop and implement a written housekeeping program that establishes the frequency and method(s) determined best to reduce accumulations of fugitive grain dust on ledges, floors, equipment, and other exposed surfaces.

(2) In addition, the housekeeping program for grain elevators shall address fugitive grain dust accumulations at priority housekeeping areas.

(a) Priority housekeeping areas shall include at least the following:

(i) Floor areas within thirty-five feet (10.7 m) of inside bucket elevators;

(ii) Floors of enclosed areas containing grinding equipment;

(iii) Floors of enclosed areas containing grain dryers located inside the facility.

(b) The employer shall immediately remove any fugitive grain dust accumulations whenever they exceed

one-eighth inch (.32 cm) at priority housekeeping areas, pursuant to the housekeeping program, or shall demonstrate and assure, through the development and implementation of the housekeeping program, that equivalent protection is provided.

(3) The use of compressed air to blow dust from ledges, walls, and other areas shall only be permitted when all machinery that presents an ignition source in the area is shut-down, and all other known potential ignition sources in the area are removed or controlled.

(4) Grain and product spills shall not be considered fugitive grain dust accumulations. However, the housekeeping program shall address the procedures for removing such spills from the work area.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-050, filed 11/14/88.]

WAC 296-99-055 Grate openings. (1) Receiving-pit feed openings, such as truck or railcar receiving-pits, shall be covered by grates.

(2) The width of openings in the grates shall be a maximum of two and one-half inches (6.35 cm).

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-055, filed 11/14/88.]

WAC 296-99-060 Filter collectors. (1) Not later than March 30, 1989, all fabric dust filter collectors which are a part of a pneumatic dust collection system shall be equipped with a monitoring device that will indicate a pressure drop across the surface of the filter.

(2) Filter collectors installed after March 30, 1988, shall be:

- (a) Located outside the facility; or
- (b) Located in an area inside the facility protected by an explosion suppression system; or
- (c) Located in an area inside the facility that is separated from other areas of the facility by construction having at least a one hour fire-resistance rating, and which is adjacent to an exterior wall and vented to the outside. The vent and ductwork shall be designed to resist rupture due to deflagration.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-060, filed 11/14/88.]

WAC 296-99-065 Preventive maintenance. (1) The employer shall implement preventive maintenance procedures consisting of:

(a) Regularly scheduled inspections of at least the mechanical and safety control equipment associated with dryers, grain stream processing equipment, dust collection equipment including filter collectors, and bucket elevators;

(b) Lubrication and other appropriate maintenance in accordance with manufacturers' recommendations, or as determined necessary by prior operating records.

(2) The employer shall promptly correct dust collection systems which are malfunctioning or which are operating below designed efficiency. Additionally, the employer shall promptly correct, or remove from service, overheated bearings and slipping or misaligned belts associated with inside bucket elevators.

(3) A certification record shall be maintained of each inspection, performed in accordance with this section, containing the date of the inspection, the name of the person who performed the inspection and the serial number, or other identifier, of the equipment specified in subsection (1)(a) of this section that was inspected.

(4) The employer shall implement procedures for the use of tags and locks which will prevent the inadvertent application of energy or motion to equipment being repaired, serviced, or adjusted, which could result in employee injury. Such locks and tags shall be removed in accordance with established procedures only by the employee installing them or, if unavailable, by his or her supervisor.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-065, filed 11/14/88.]

WAC 296-99-070 Grain stream processing equipment. The employer shall equip grain stream processing equipment (such as hammer mills, grinders, and pulverizers) with an effective means of removing ferrous material from the incoming grain stream.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-070, filed 11/14/88.]

WAC 296-99-075 Emergency escape. (1) The employer shall provide at least two means of emergency escape from galleries (bin decks).

(2) The employer shall provide at least one means of emergency escape in tunnels of existing grain elevators. Tunnels in grain elevators constructed after the effective date of this standard shall be provided with at least two means of emergency escape.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-075, filed 11/14/88.]

WAC 296-99-080 Continuous-flow bulk raw grain dryers. (1) Not later than April 1, 1991, all direct-heat grain dryers shall be equipped with automatic controls that:

(a) Will shut-off the fuel supply in case of power or flame failure or interruption of air movement through the exhaust fan; and

(b) Will stop the grain from being fed into the dryer if excessive temperature occurs in the exhaust of the drying section.

(2) Direct-heat grain dryers installed after March 30, 1988, shall be:

- (a) Located outside the grain elevator; or
- (b) Located in an area inside the grain elevator protected by a fire or explosion suppression system; or
- (c) Located in an area inside the grain elevator which is separated from other areas of the facility by construction having at least a one hour fire-resistance rating.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-080, filed 11/14/88.]

WAC 296-99-085 Inside bucket elevators. (1) Bucket elevators shall not be joggled to free a choked leg.

(2) All belts and lagging purchased after March 30, 1988, shall be conductive. Such belts shall have a surface electrical resistance not to exceed 300 megohms.

(3) Not later than April 1, 1991, all bucket elevators shall be equipped with a means of access to the head pulley section to allow inspection of the head pulley, lagging, belt, and discharge throat of the elevator head. The boot section shall also be provided with a means of access for clean-out of the boot and for inspection of the boot, pulley, and belt.

(4) Not later than April 1, 1991, the employer shall:

(a) Mount bearings externally to the leg casing; or

(b) Provide vibration monitoring, temperature monitoring, or other means to monitor the condition of those bearings mounted inside or partially-inside the leg casing.

(5) Not later than April 1, 1991, the employer shall equip bucket elevators with a motion detection device which will shut-down the bucket elevator when the belt speed is reduced by no more than twenty percent of the normal operating speed.

(6) Not later than April 1, 1991, the employer shall:

(a) Equip bucket elevators with a belt alignment monitoring device which will initiate an alarm to employees when the belt is not tracking properly; or

(b) Provide a means to keep the belt tracking properly, such as a system that provides constant alignment adjustment of belts.

(7) Subsections (5) and (6) of this section do not apply to grain elevators having a permanent storage capacity of less than one million bushels, provided that daily visual inspection is made of bucket movement and tracking of the belt.

(8) Subsections (4), (5), and (6) of this section do not apply to the following:

(a) Bucket elevators which are equipped with an operational fire and explosion suppression system capable of protecting at least the head and boot section of the bucket elevator; or

(b) Bucket elevators which are equipped with pneumatic or other dust control systems or methods that keep the dust concentration inside the bucket elevator at least twenty-five percent below the lower explosive limit at all times during operations.

Note: The following appendices to this chapter serve as nonmandatory guidelines to assist employers and employees in complying with the requirements of this section, as well as to provide other helpful information.

No additional burdens are imposed through these appendices.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-085, filed 11/14/88.]

WAC 296-99-090 Appendix A, grain handling facilities.

Note: Examples presented in this appendix may not be the only means of achieving the performance goals in the standard.

(1) Scope and application. The provisions of this standard apply in addition to any other applicable requirements of chapters 296-24 and 296-62 WAC (or

chapter 296-56 WAC at marine terminals). The standard contains requirements for new and existing grain handling facilities. The standard does not apply to seed plants which handle and prepare seeds for planting of future crops, nor to on-farm storage or feed lots.

(2) Emergency action plan.

(a) The standard requires the employer to develop and implement an emergency action plan. The emergency action plan WAC 296-24-567 covers those designated actions employers and employees are to take to ensure employee safety from fire and other emergencies. The plan specifies certain minimum elements which are to be addressed. These elements include the establishment of an employee alarm system, the development of evacuation procedures, and training employees in those actions they are to take during an emergency.

(b) The standard does not specify a particular method for notifying employees of an emergency. Public announcement systems, air horns, steam whistles, a standard fire alarm system, or other types of employee alarm may be used. However, employers should be aware that employees in a grain facility may have difficulty hearing an emergency alarm, or distinguishing an emergency alarm from other audible signals at the facility, or both. Therefore, it is important that the type of employee alarm used be distinguishable and distinct.

(c) The use of floor plans or workplace maps which clearly show the emergency escape routes should be included in the emergency action plan; color coding will aid employees in determining their route assignments. The employer should designate a safe area, outside the facility, where employees can congregate after evacuation, and implement procedures to account for all employees after emergency evacuation has been completed.

(d) It is also recommended that employers seek the assistance of the local fire department for the purpose of preplanning for emergencies. Preplanning is encouraged to facilitate coordination and cooperation between facility personnel and those who may be called upon for assistance during an emergency. It is important for emergency service units to be aware of the usual work locations of employees at the facility.

(3) Training.

(a) It is important that employees be trained in the recognition and prevention of hazards associated with grain facilities, especially those hazards associated with their own work tasks. Employees should understand the factors which are necessary to produce a fire or explosion, i.e., fuel (such as grain dust), oxygen, ignition source, and (in the case of explosions) confinement. Employees should be made aware that any efforts they make to keep these factors from occurring simultaneously will be an important step in reducing the potential for fires and explosions.

(b) The standard provides flexibility for the employer to design a training program which fulfills the needs of a facility. The type, amount, and frequency of training will need to reflect the tasks that employees are expected to perform. Although training is to be provided to employees at least annually, it is recommended that safety

meetings or discussions and drills be conducted at more frequent intervals.

(c) The training program should include those topics applicable to the particular facility, as well as topics such as: Hot work procedures; lock-out/tag-out procedures; bin entry procedures; bin cleaning procedures; grain dust explosions; fire prevention; procedures for handling "hot grain"; housekeeping procedures, including methods and frequency of dust removal; pesticide and fumigant usage; proper use and maintenance of personal protective equipment; and, preventive maintenance. The types of work clothing should also be considered in the program at least to caution against using polyester clothing that easily melts and increases the severity of burns, as compared to wool or fire retardant cotton.

(d) In implementing the training program, it is recommended that the employer utilize films, slide-tape presentations, pamphlets, and other information which can be obtained from such sources as the Grain Elevator and Processing Society, the Cooperative Extension Service of the United States Department of Agriculture, Kansas State University's Extension Grain Science and Industry, and other state agriculture schools, industry associations, union organizations, and insurance groups.

(4) Hot work permit.

(a) The implementation of a permit system for hot work is intended to assure that employers maintain control over operations involving hot work and to assure that employees are aware of and utilize appropriate safeguards when conducting these activities.

(b) Precautions for hot work operations are specified in WAC 296-24-695, and include such safeguards as relocating the hot work operation to a safe location if possible, relocating or covering combustible material in the vicinity, providing fire extinguishers, and provisions for establishing a fire watch. Permits are not required for hot work operations conducted in the presence of the employer or the employer's authorized representative who would otherwise issue the permit, or in an employer authorized welding shop or when work is conducted outside and away from the facility.

(c) It should be noted that the permit is not a record, but is an authorization of the employer certifying that certain safety precautions have been implemented prior to the beginning of work operations.

(5) Entry into bins, silos, and tanks.

(a) In order to assure that employers maintain control over employee entry into bins, silos, and tanks, WISHA is requiring that the employer issue a permit for entry into bins, silos, and tanks unless the employer (or the employer's representative who would otherwise authorize the permit) is present at the entry and during the entire operation.

(b) Employees should have a thorough understanding of the hazards associated with entry into bins, silos, and tanks. Employees are not to be permitted to enter these spaces from the bottom when grain or other agricultural products are hung up or sticking to the sides which might fall and injure or kill an employee. Employees should be made aware that the atmosphere in bins, silos,

and tanks can be oxygen deficient or toxic. Employees should be trained in the proper methods of testing the atmosphere, as well as in the appropriate procedures to be taken if the atmosphere is found to be oxygen deficient or toxic. When a fumigant has been recently applied in these areas and entry must be made, aeration fans should be running continuously to assure a safe atmosphere for those inside. Periodic monitoring of toxic levels should be done by direct reading instruments to measure the levels, and, if there is an increase in these readings, appropriate actions should be promptly taken.

(c) Employees have been buried and suffocated in grain or other agricultural products because they sank into the material. Therefore, it is suggested that employees not be permitted to walk or stand on the grain or other grain product where the depth is greater than waist high. In this regard, employees must use a full body harness or boatswain's chair with a lifeline when entering from the top. A winch system with mechanical advantage (either powered or manual) would allow better control of the employee than just using a hand held hoist line, and such a system would allow the observer to remove the employee easily without having to enter the space.

(d) It is important that employees be trained in the proper selection and use of any personal protective equipment which is to be worn. Equally important is the training of employees in the planned emergency rescue procedures. Employers should carefully read WAC 296-62-07115 and assure that their procedures follow these requirements. The employee acting as observer is to be equipped to provide assistance and is to know procedures for obtaining additional assistance. The observer should not enter a space until adequate assistance is available. It is recommended that an employee trained in CPR be readily available to provide assistance to those employees entering bins, silos, or tanks.

(6) Contractors.

(a) These provisions of the standard are intended to ensure that outside contractors are cognizant of the hazards associated with grain handling facilities, particularly in relation to the work they are to perform for the employer. Also, in the event of an emergency, contractors should be able to take appropriate action as a part of the overall facility emergency action plan. Contractors should also be aware of the employer's permit systems. Contractors should develop specified procedures for performing hot work and for entry into bins, silos, and tanks and these activities should be coordinated with the employer. Contractors are responsible for informing their own employees.

(b) This coordination will help to ensure that employers know what work is being performed at the facility by contractors; where it is being performed; and, that it is being performed in a manner that will not endanger employees.

(7) Housekeeping.

(a) The housekeeping program is to be designed to keep dust accumulations and emissions under control inside grain facilities. The housekeeping program, which is

to be written, is to specify the frequency and method(s) used to best reduce dust accumulations.

(b) Ship, barge, and rail loadout and receiving areas which are located outside the facility need not be addressed in the housekeeping program. Additionally, truck dumps which are open on two or more sides need not be addressed by the housekeeping program. Other truck dumps should be addressed in the housekeeping program to provide for regular cleaning during periods of receiving grain or agricultural products. The housekeeping program should provide coverage for all workspaces in the facility and include walls, beams, etc., especially in relation to the extent that dust could accumulate.

(i) Dust accumulations.

(A) Almost all facilities will require some level of manual housekeeping. Manual housekeeping methods, such as vacuuming or sweeping with soft bristle brooms, should be used which will minimize the possibility of layered dust being suspended in the air when it is being removed.

(B) The housekeeping program should include a contingency plan to respond to situations where dust accumulates rapidly due to a failure of a dust enclosure hood, an unexpected breakdown of the dust control system, a dust-tight connection inadvertently knocked open, etc.

(C) The housekeeping program should also specify the manner of handling spills. Grain spills are not considered to be dust accumulations.

(D) A fully enclosed horizontal belt conveying system where the return belt is inside the enclosure should have inspection access such as sliding panels or doors to permit checking of equipment, checking for dust accumulations and facilitate cleaning if needed.

(ii) Dust emissions.

(A) Employers should analyze the entire stock handling system to determine the location of dust emissions and effective methods to control or to eliminate them. The employer should make sure that holes in spouting, casings of bucket elevators, pneumatic conveying pipes, screw augers, or drag conveyor casings, are patched or otherwise properly repaired to prevent leakage. Minimizing free falls of grain or grain products by using choke feeding techniques, and utilization of dust-tight enclosures at transfer points, can be effective in reducing dust emissions.

(B) Each housekeeping program should specify the schedules and control measures which will be used to control dust emitted from the stock handling system. The housekeeping program should address the schedules to be used for cleaning dust accumulations from motors, critical bearings and other potential ignition sources in the working areas. Also, the areas around bucket elevator legs, milling machinery and similar equipment should be given priority in the cleaning schedule. The method of disposal of the dust which is swept or vacuumed should also be planned.

(C) Dust may accumulate in somewhat inaccessible areas, such as those areas where ladders or scaffolds might be necessary to reach them. The employer may

want to consider the use of compressed air and long lances to blow down these areas frequently. The employer may also want to consider the periodic use of water and hoses to wash down these areas. If these methods are used, they are to be specified in the housekeeping program along with the appropriate safety precautions, including the use of personal protective equipment such as eyewear and dust respirators.

(D) Several methods have been effective in controlling dust emissions. A frequently used method of controlling dust emissions is a pneumatic dust collection system. However, the installation of a poorly designed pneumatic dust collection system has fostered a false sense of security and has often led to an inappropriate reduction in manual housekeeping. Therefore, it is imperative that the system be designed properly and installed by a competent contractor. Those employers who have a pneumatic dust control system that is not working according to expectations should request the engineering design firm, or the manufacturer of the filter and related equipment, to conduct an evaluation of the system to determine the corrections necessary for proper operation of the system. If the design firm or manufacturer of the equipment is not known, employers should contact their trade association for recommendations of competent designers of pneumatic dust control systems who could provide assistance.

(E) When installing a new or upgraded pneumatic control system, the employer should insist on an acceptance test period of thirty to forty-five days of operation to ensure that the system is operating as intended and designed. The employer should also obtain maintenance, testing, and inspection information from the manufacturer to ensure that the system will continue to operate as designed.

(F) Aspiration of the leg, as part of a pneumatic dust collection system, is another effective method of controlling dust emissions. Aspiration of the leg consists of a flow of air across the entire boot, which entrains the liberated dust and carries it up the up-leg to take-off points. With proper aspiration, dust concentrations in the leg can be lowered below the lower explosive limit. Where a prototype leg installation has been instrumented and shown to be effective in keeping the dust level twenty-five percent below the lower explosive limit during normal operations for the various products handled, then other legs of similar size, capacity and products being handled which have the same design criteria for the air aspiration would be acceptable to OSHA, provided the prototype test report is available on site.

(G) Another method of controlling dust emissions is enclosing the conveying system, pressurizing the general work area, and providing a lower pressure inside the enclosed conveying system. Although this method is effective in controlling dust emissions from the conveying system, adequate access to the inside of the enclosure is necessary to facilitate frequent removal of dust accumulations. This is also necessary for those systems called "self-cleaning."

(H) The use of edible oil sprayed on or into a moving stream of grain is another method which has been used

to control dust emissions. Tests performed using this method have shown that the oil treatment can reduce dust emissions. Repeated handling of the grain may necessitate additional oil treatment to prevent liberation of dust. However, before using this method, operators of grain handling facilities should be aware that the Food and Drug Administration must approve the specific oil treatment used on products for food and feed.

(1) As a part of the housekeeping program, grain elevators are required to address accumulations of dust at priority areas using the action level. The standard specifies a maximum accumulation of one-eighth inch dust, measurable by a ruler or other measuring device, anywhere within a priority area as the upper limit at which time employers must initiate action to remove the accumulations using designated means or methods. Any accumulation in excess of this amount and where no action has been initiated to implement cleaning would constitute a violation of the standard, unless the employer can demonstrate equivalent protection. Employers should make every effort to minimize dust accumulations on exposed surfaces since dust is the fuel for a fire or explosion, and it is recognized that a one-eighth inch dust accumulation is more than enough to fuel such occurrences.

(8) Filter collectors.

(a) Proper sizing of filter collectors for the pneumatic dust control system they serve is very important for the overall effectiveness of the system. The air to cloth ratio of the system should be in accordance with the manufacturer's recommendations. If higher ratios are used, they can result in more maintenance on the filter, shorter bag or sock life, increased differential pressure resulting in higher energy costs, and an increase in operational problems.

(b) A photohelic gauge, magnehelic gauge, or manometer, may be used to indicate the pressure rise across the inlet and outlet of the filter. When the pressure exceeds the design value for the filter, the air volume will start to drop, and maintenance will be required. Any of these three monitoring devices is acceptable as meeting WAC 296-99-060(1).

(c) The employer should establish a level or target reading on the instrument which is consistent with the manufacturer's recommendations that will indicate when the filter should be serviced. This target reading on the instrument and the accompanying procedures should be in the preventive maintenance program. These efforts would minimize the blinding of the filter and the subsequent failure of the pneumatic dust control system.

(d) There are other instruments that the employer may want to consider using to monitor the operation of the filter. One instrument is a zero motion switch for detecting a failure of motion by the rotary discharge valve on the hopper. If the rotary discharge valve stops turning, the dust released by the bag or sock will accumulate in the filter hopper until the filter becomes clogged. Another instrument is a level indicator which is installed in the hopper of the filter to detect the buildup of dust that would otherwise cause the filter hopper to

be plugged. The installation of these instruments should be in accordance with manufacturer's recommendations.

(e) All of these monitoring devices and instruments are to be capable of being read at an accessible location and checked as frequently as specified in the preventive maintenance program.

(f) Filter collectors on portable vacuum cleaners, and those used where fans are not part of the system, are not covered by requirements of WAC 296-99-060.

(9) Preventive maintenance.

(a) The control of dust and the control of ignition sources are the most effective means for reducing explosion hazards. Preventive maintenance is related to ignition sources in the same manner as housekeeping is related to dust control and should be treated as a major function in a facility. Equipment such as critical bearings, belts, buckets, pulleys, and milling machinery are potential ignition sources, and periodic inspection and lubrication of such equipment through a scheduled preventive maintenance program is an effective method for keeping equipment functioning properly and safely. The use of vibration detection methods, heat-sensitive tape or other heat detection methods that can be seen by the inspector or maintenance person will allow for a quick, accurate, and consistent evaluation of bearings and will help in the implementation of the program.

(b) The standard does not require a specific frequency for preventive maintenance. The employer is permitted flexibility in determining the appropriate interval for maintenance provided that the effectiveness of the maintenance program can be demonstrated. Scheduling of preventive maintenance should be based on manufacturer's recommendations for effective operation, as well as from the employer's previous experience with the equipment. However, the employer's schedule for preventive maintenance should be frequent enough to allow for both prompt identification and correction of any problems concerning the failure or malfunction of the mechanical and safety control equipment associated with bucket elevators, dryers, filter collectors, and magnets. The pressure-drop monitoring device for a filter collector, and the condition of the lagging on the head pulley, are examples of items that require regularly scheduled inspections. A system of identifying the date, the equipment inspected and the maintenance performed, if any, will assist employers in continually refining their preventive maintenance schedules and identifying equipment problem areas. Open work orders where repair work or replacement is to be done at a designated future date as scheduled, would be an indication of an effective preventive maintenance program.

(c) It is imperative that the prearranged schedule of maintenance be adhered to regardless of other facility constraints. The employer should give priority to the maintenance or repair work associated with safety control equipment, such as that on dryers, magnets, alarm and shut-down systems on bucket elevators, bearings on bucket elevators, and the filter collectors in the dust control system. Benefits of a strict preventive maintenance program can be a reduction of unplanned downtime, improved equipment performance, planned use of

resources, more efficient operations, and, most importantly, safer operations.

(d) The standard also requires the employer to develop and implement procedures consisting of locking-out and tagging equipment to prevent the inadvertent application of energy or motion to equipment being repaired, serviced, or adjusted, which could result in employee injury. All employees who have responsibility for repairing or servicing equipment, as well as those who operate the equipment, are to be familiar with the employer's lock and tag procedures. A lock is to be used as the positive means to prevent operation of the disconnected equipment. Tags are to be used to inform employees why equipment is locked out. Tags are to meet requirements in WAC 296-24-14001. Locks and tags may only be removed by employees that placed them, or by their supervisor, to ensure the safety of the operation.

(10) Grain stream processing equipment. The standard requires an effective means of removing ferrous material from grain streams so that such material does not enter equipment such as hammer mills, grinders, and pulverizers. Large foreign objects, such as stones, should have been removed at the receiving pit. Introduction of foreign objects and ferrous material into such equipment can produce sparks which can create an explosion hazard. Acceptable means for removal of ferrous materials include the use of permanent or electromagnets. Means used to separate foreign objects and ferrous material should be cleaned regularly and kept in good repair as part of the preventive maintenance program in order to maximize their effectiveness.

(11) Emergency escape. The standard specifies that at least two means of escape must be provided from galleries (bin decks). Means of emergency escape may include any available means of egress, consisting of three components, exit access, exit, and exit discharge as defined in WAC 296-24-55001, the use of controlled descent devices with landing velocities not to exceed fifteen ft./sec., or emergency escape ladders from galleries. Importantly, the means of emergency escape are to be addressed in the facility emergency action plan. Employees are to know the location of the nearest means of emergency escape and the action they must take during an emergency.

(12) Dryers. Liquefied petroleum gas-fired dryers should have the vaporizers installed at least ten feet from the dryer. The gas piping system should be protected from mechanical damage. The employer should establish procedures for locating and repairing leaks when there is a strong odor of gas or other signs of a leak.

(13) Inside bucket elevators.

(a) Hazards associated with inside bucket elevator legs are the source of many grain elevator fires and explosions. Therefore, to mitigate these hazards, the standard requires the implementation of special safety precautions and procedures, as well as the installation of safety control devices. The standard provides for a phase-in period for many of the requirements to provide the employer time for planning the implementation of

the requirements. Additionally, for elevators with a permanent storage capacity of less than one million bushels, daily visual inspection of belt alignment and bucket movement can be substituted for alignment monitoring devices and motion detection devices.

(b) The standard requires that belts (purchased after the effective date of the standard) have surface electrical resistance not to exceed 300 megohms. Test methods available regarding electrical resistance of belts are: The American Society for Testing and Materials D257-76, "Standard Test Methods for D-C Resistance or Conductance of Insulating Materials"; and, the International Standards Organization's No. 284, "Conveyor Belts—Electrical Conductivity—Specification and Method of Test." When an employer has a written certification from the manufacturer that a belt has been tested using one of the above test methods, and meets the 300 megohm criteria, the belt is acceptable as meeting this standard. When using conductive belts, the employer should make certain that the head pulley and shaft are grounded through the drive motor ground or by some other equally effective means. When V-type drive belts are used to transmit power to the head pulley assembly from the motor drive shaft, it will be necessary to provide electrical continuity from the head pulley assembly to ground, e.g., motor grounds.

(c) Employers should also consider purchasing new belts that are flame retardant or fire resistive. A flame resistance test for belts is contained in 30 CFR 18.65.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-090, filed 11/14/88.]

WAC 296-99-093 Appendix B, grain handling facilities. National consensus standards.

The following table contains a cross-reference listing of current national consensus standards which provide information that may be of assistance to grain handling operations. Employers who comply with provisions in these national consensus standards that provide equal or greater protection than those in this chapter will be considered in compliance with the corresponding requirements in this chapter.

Subject	National consensus standards
Grain elevators and facilities handling bulk raw agricultural commodities	ANSI/NFPA 61B
Feed mills	ANSI/NFPA 61C
Facilities handling agricultural commodities for human consumption	ANSI/NFPA 61D
Pneumatic conveying systems for agricultural commodities	ANSI/NFPA 66
Guide for explosion venting	ANSI/NFPA 68
Explosion prevention systems	ANSI/NFPA 69
Dust removal and exhaust systems	ANSI/NFPA 91

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-093, filed 11/14/88.]

WAC 296-99-095 Appendix C, grain handling facilities. References for further information.

The following references provide information which can be helpful in understanding the requirements contained in various provisions of the standard, as well as provide other helpful information.

(1) Accident Prevention Manual for Industrial Operations; National Safety Council, 425 North Michigan Avenue, Chicago, Illinois 60611.

(2) Practical Guide to Elevator Design; National Grain and Feed Association, P.O. Box 28328, Washington, DC 20005.

(3) Dust Control for Grain Elevators; National Grain and Feed Association, P.O. Box 28328, Washington, DC 20005.

(4) Prevention of Grain Elevator and Mill Explosions; National Academy of Sciences, Washington, DC. (Available from National Technical Information Service, Springfield, Virginia 22151.)

(5) Standard for the Prevention of Fires and Explosions in Grain Elevators and Facilities Handling Bulk Raw Agricultural Commodities, NFPA 61B; National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

(6) Standard for the Prevention of Fire and Dust Explosions in Feed Mills, NFPA 61C; National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

(7) Standard for the Prevention of Fire and Dust Explosions in the Milling of Agricultural Commodities for Human Consumption, NFPA 61D; National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

(8) Standard for Pneumatic Conveying Systems for Handling Feed, Flour, Grain and Other Agricultural Dusts, NFPA 66; National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

(9) Guide for Explosion Venting, NFPA 68; National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

(10) Standard on Explosion Prevention Systems, NFPA 69; National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

(11) Safety-Operations Plans; United States Department of Agriculture, Washington, DC 20250.

(12) Inplant Fire Prevention Control Programs; Mill Mutual Fire Prevention Bureau, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(13) Guidelines for Terminal Elevators; Mill Mutual Fire Prevention Bureau, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(14) Standards for Preventing the Horizontal and Vertical Spread of Fires in Grain Handling Properties; Mill Mutual Fire Prevention Bureau, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(15) Belt Conveyors for Bulk Materials, Part I and Part II, Data Sheet 570, Revision A; National Safety Council, 425 North Michigan Avenue, Chicago, Illinois 60611.

(16) Suggestions for Precautions and Safety Practices in Welding and Cutting; Mill Mutual Fire Prevention Bureau, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(17) Food Bins and Tanks, Data Sheet 524; National Safety Council, 425 North Michigan Avenue, Chicago, Illinois 60611.

(18) Pneumatic Dust Control in Grain Elevators; National Academy of Sciences, Washington, DC. (Available from National Technical Information Service, Springfield, Virginia 22151.)

(19) Dust Control Analysis and Layout Procedures for Grain Storage and Processing Plants; Mill Mutual Fire Prevention Bureau, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(20) Standard for the Installation of Blower and Exhaust Systems for Dust, Stock and Vapor Removal, NFPA 91; National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

(21) Standards for the Installation of Direct Heat Grain Dryers in Grain and Milling Properties; Mill Mutual Fire Prevention Bureau, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(22) Guidelines for Lubrication and Bearing Maintenance; Mill Mutual Fire Prevention Bureau, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(23) Organized Maintenance in Grain and Milling Properties; Mill Mutual Fire Prevention Bureau, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(24) Safe and Efficient Elevator Legs for Grain and Milling Properties; Mill Mutual Fire Prevention Bureau, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(25) Explosion Venting and Suppression of Bucket Elevators; National Grain and Feed Association, P.O. Box 28328, Washington, DC 20005.

(26) Lightning Protection Code, NFPA 78; National Fire Protection Association, Batterymarch Park, Quincy, Massachusetts 02269.

(27) Occupational Safety in Grain Elevators, DHHS (NIOSH) Publication No. 83-126; National Institute for Occupational Safety and Health, Morgantown, West Virginia 26505.

(28) Retrofitting and Constructing Grain Elevators; National Grain and Feed Association, P.O. Box 28328, Washington, DC 20005.

(29) Grain Industry Safety and Health Center-Training Series. (Preventing grain dust explosions, operations maintenance safety, transportation safety, occupational safety and health); Grain Elevator and Processing Society, P.O. Box 15026, Commerce Station, Minneapolis, Minnesota 55415-0026.

(30) Suggestions for Organized Maintenance; The Mill Mutuals Loss Control Department, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(31) Safety-The First Step to Success; The Mill Mutuals Loss Control Department, 1 Pierce Place, Suite 1260 West, Itasca, Illinois 60143-1269.

(32) Emergency Plan Notebook; Schoeff, Robert W. and James L. Balding, Kansas State University, Cooperative Extension Service, Extension Grain Science and Industry, Shellenberger Hall, Manhattan, Kansas 66506.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-99-095, filed 11/14/88.]

Chapter 296-104 WAC

BOARD OF BOILER RULES—SUBSTANTIVE

WAC

296-104-010	Definitions.
296-104-220	Inspection of systems—Nonstandard second hand boilers or unfired pressure vessels.
296-104-265	Inspection of systems—Control and limit devices.
296-104-701	Civil penalties.
296-104-800	Inspection of systems subject to radioactivity.

WAC 296-104-010 Definitions. (1) "Director" shall mean the director of the department of labor and industries.

(2) "Board of boiler rules" shall mean the board created by law and empowered to make, alter, amend, and interpret rules and regulations for the safe and proper construction, installation, repair, and use of boilers and for the proper construction, installation, and repair of unfired pressure vessels in this state.

(3) "Chief inspector" shall mean the chief boiler inspector appointed under RCW 70.79.100.

(4) "Deputy inspector" shall mean a deputy inspector of boilers and unfired pressure vessels appointed by the chief boiler inspector of Washington under the provisions of RCW 70.79.120.

(5) "Special inspector" shall mean an inspector holding a Washington commission, who is regularly employed by an insurance company authorized to insure against loss from explosion of boilers and unfired pressure vessels in this state, or who is continuously employed by any company operating unfired pressure vessels in this state for the purpose of making inspections of unfired pressure vessels used or to be used by such company.

(6) "Inspector" shall mean the chief boiler inspector, a deputy inspector, or a special inspector.

(7) "Certificate of competency" shall mean a certificate issued to a person who has passed an examination prescribed by the board of boiler rules.

(8) "Department" as used herein shall mean the department of labor and industries of the state of Washington.

(9) "Owner" or "user" shall mean a person, firm, or corporation owning or operating any boiler or unfired pressure vessel within the state.

(10) "ASME Code" shall mean the boiler and pressure vessel code of the American Society of Mechanical Engineers with amendments and interpretations thereto made and approved by the council of the society which have been regularly adopted by the board of boiler rules in accordance with the provisions of RCW 70.79.030.

(11) "Existing installations" shall mean any boiler or unfired pressure vessel constructed, installed, placed in operation, or contracted for before January 1, 1952.

(12) "Approved" shall mean approved by the chief boiler inspector as evidenced by his issuance of an inspection certificate.

(13) "Standard boiler or unfired pressure vessel" shall mean a boiler or unfired pressure vessel which bears the ASME stamp.

(14) "Nonstandard boiler or unfired pressure vessel" shall mean a boiler or unfired pressure vessel that does not bear the ASME stamp.

(15) "Boiler" shall mean a closed vessel used for heating water or liquid or for generating steam or vapor by the direct application of heat.

(16) "Direct application of heat" shall mean the firing of any fuel, solid, liquid, or gaseous, including electrical elements of any description.

(17) "Power boiler" shall mean a boiler used to produce steam or vapor at a pressure exceeding 15 lbs. per square inch gage, or a boiler used for heating water or liquid to a pressure exceeding 160 psi. or to a temperature exceeding 250°F.

(18) "Low pressure heating boiler" shall mean a boiler operated at a pressure not exceeding 15 lbs. per square inch gage steam, or at a pressure not exceeding 160 lbs. per square inch and a temperature not exceeding 250°F. for water.

(19) "Hot water supply boiler" shall mean a low pressure boiler used to heat water to a temperature not exceeding 200°F.

(20) "Unfired steam boiler" shall mean a pressure vessel in which steam is generated by an indirect application of heat.

(21) "Unfired pressure vessel" shall mean a closed vessel in which pressure is obtained from an external source, or from an indirect application of heat, including steam or hot water coils, converters or heat exchangers.

(22) "Reinstalled boiler or unfired pressure vessel" shall mean a boiler or unfired pressure vessel removed from its original setting and reerected at the same location or at a new location without change of ownership.

(23) "Second hand boiler or unfired pressure vessel" shall mean a boiler or unfired pressure vessel of which both the location and ownership have changed after primary use.

(24) "Condemned boiler or unfired pressure vessel" shall mean a boiler or unfired pressure vessel that has been inspected and declared unsafe or disqualified by legal requirements by an inspector who has applied a stamping or marking designating its condemnation.

(25) "Internal inspection" shall mean an inspection made when a boiler or unfired pressure vessel is shut down and handholes, manholes, or other inspection openings are open or removed for inspection of the interior. An ultrasonic examination of unfired pressure vessels 36" diameter and under, shall constitute an internal inspection.

(26) "External inspection" shall mean an inspection made while a boiler or unfired pressure vessel is in operation and includes the inspection and demonstration of controls and safety devices.

(27) "Place of public assembly" shall mean a building used in whole or in part for occupation by persons for such purposes as worship, hospitals, education, instruction, entertainment, amusement, waiting transportation, or child care centers.

Child care centers include those agencies which operate facilities for the care of thirteen children or more.

No such center shall be located in a private family residence. The substantive rules of this code shall apply to all child care centers operated in the state of Washington.

(28) "Fusion welding" shall mean a process of welding metals in a molten, or molten and vaporous state, without the application of mechanical pressure or blows. Such welding may be accomplished by the oxy-acetylene or oxy-hydrogen flame or by the electric arc. Thermit welding shall be classified as fusion welding.

(29) "Major repair" shall mean one upon which the strength of a boiler or unfired pressure vessel depends.

(30) "Agriculture purposes" shall mean any act performed on a farm in production of crops or livestock, and shall include the storage of such crops and livestock in their natural state, but shall not be construed to include the processing or sale of crops or livestock.

(31) "Attendant" shall mean the person in charge of the operation of a boiler or unfired pressure vessel.

(32) "Automatic operation of a boiler" shall mean full control of feed water and fuel in order to maintain the pressure and temperature constant within the limits set. Controls must be such that the operation follows the demand without interruption. Manual restart may be required when the burner is off because of low water, flame failure, or power failure.

(33) "Alteration" is a structural modification of, or a departure from an original design or existing construction.

(34) "Repair" is a restoration of any damaged or impaired part to an effective and safe condition.

[Statutory Authority: RCW 70.79.240, 88-01-064 (Order 87-25), § 296-104-010, filed 12/17/87. Statutory Authority: RCW 70.79.040 and 70.79.050, 86-01-088 (Order 85-26), § 296-104-010, filed 12/19/85; Order 72-11, § 296-104-010, filed 7/7/72; Part I, filed 3/23/60.]

WAC 296-104-220 Inspection of systems--Non-standard second hand boilers or unfired pressure vessels. Nonstandard second hand boilers or unfired pressure vessels cannot be used in this state.

[Statutory Authority: RCW 70.79.240, 88-01-064 (Order 87-25), § 296-104-220, filed 12/17/87; Part IV, § 5, filed 3/23/60.]

WAC 296-104-265 Inspection of systems--Control and limit devices. All automatically fired steam, vapor, or hot water boilers excepting boilers having a constant attendant who has no other duties while the boiler is in operation, shall be equipped with an automatic low-water fuel cut-off and an automatic water feeding device. These may be incorporated in one body or may be separate devices. Designs embodying a float and float bowl shall have a vertical straight-away valve drain pipe at lowest point in the water equalizing pipe connection by which the bowl and equalizing pipe can be flushed and the device tested. Immersion units shall be designed so that they may be readily tested at frequent intervals. All boilers newly installed after June 1989 that are automatically fired low pressure steam heating boilers, small power boilers, and power steam boilers without a constant attendant who has no other duties shall be equipped with two high steam pressure limit controls,

one of which shall be provided with a manual reset on the control with the highest setting, and two low-water fuel cut-offs, one of which shall be provided with a manual reset device and independent of the feed water controller. Coil type flash steam boilers may use two high-temperature limit controls, one of which shall be manually reset in the hot water coil section of the boiler instead of the low-water fuel cut-off. Control and limit devices shall be independently connected and electrically wired in series.

All automatically fired hot water supply, low-pressure hot water heating boilers, and power hot water boilers shall be equipped with two high-temperature limit controls, one of which shall be provided with a manual reset on the control with the highest setting, and one low-water fuel cut-off with a manual reset and independent of the feed water controller. For coil type hot water boilers a low-water flow limit control installed in the circulating water line may be used instead of a low-water fuel cut-off. Control and limit devices shall be independently connected and electrically wired in series.

[Statutory Authority: RCW 70.79.240, 88-01-064 (Order 87-25), § 296-104-265, filed 12/17/87; Part IV, § 14, filed 3/23/60.]

WAC 296-104-701 Civil penalties. (1) An owner, user, or operator of a boiler or pressure vessel that violates a provision of chapter 70.79 RCW, or of the rules adopted under that chapter, is liable for a civil penalty based on the following schedule.

Operating under pressure a boiler or pressure vessel which the department has condemned, has issued a red tag or has suspended the inspection certificate:

- First offense \$150.00
- Second offense \$300.00
- Each additional offense \$500.00

Each day of such unlawful operation shall be deemed a separate offense.

Operating under pressure a boiler or pressure vessel without a valid inspection certificate:

- First offense \$ 50.00
- Second offense \$100.00
- Each additional offense \$200.00

Each day of such unlawful operation shall be deemed a separate offense.

Installation of a boiler or pressure vessel without meeting prior filing requirements of WAC 296-104-020:

- First offense \$100.00
- Second offense \$200.00
- Each additional offense \$500.00

Performing a repair to a boiler or pressure vessel, involving welding to a pressure retaining part, without meeting requirements of WAC 296-104-500:

- First offense \$150.00
- Second offense \$300.00
- Each additional offense \$500.00

Performing an alteration to a boiler or pressure vessel without meeting requirements of WAC 296-104-501:

- First offense \$150.00
- Second offense \$300.00
- Each additional offense \$500.00

Performing resetting, repair or restamping of safety valves, safety relief valves, or rupture discs, without meeting requirements of WAC 296-104-515:

- First offense \$150.00
- Second offense \$300.00
- Each additional offense \$500.00

Failure of owner to notify chief inspector in case of accident which serves to render a boiler or unfired pressure vessel inoperative, as required by WAC 296-104-025:

- Each offense \$100.00

Failure to comply with a noncompliance report requirement:

- Within 90 days \$100.00
- Within 91-180 days \$250.00
- Within 181-270 days \$400.00
- Within 271-360 days \$500.00

(2) The department shall by certified mail notify a person of its determination that the person has violated this section.

(3) Any person aggrieved by an order or act under the boiler and unfired pressure vessels law or under the rules and regulations may, within fifteen days after such order or act, appeal to the board of boiler rules.

(4) Each day that a violation occurs will be a separate offense. A violation will be a second or additional offense only if it occurs within one year from the first violation.

[Statutory Authority: Chapter 70.79 RCW. 87-12-003 (Order 87-10), § 296-104-701, filed 5/21/87.]

WAC 296-104-800 Inspection of systems subject to radioactivity. In any case where a pressure vessel is radioactively contaminated to a degree that would not allow entering for visual inspection alternative means of inspection will be allowed. The inspector and owner shall work out a program of nondestructive examination that shall ascertain the condition of the vessel to assure its integrity.

[Statutory Authority: RCW 70.79.240. 88-01-064 (Order 87-25), § 296-104-800, filed 12/17/87.]

**Chapter 296-116 WAC
PILOTAGE RULES**

WAC

- 296-116-020 Special meeting.
- 296-116-030 Emergency meeting.
- 296-116-070 Collection of fees.
- 296-116-080 Licensing of pilots.
- 296-116-083 Examination review and appeal procedures.
- 296-116-120 Physical requirements.
- 296-116-175 Tariff proposals.

- 296-116-185 Tariffs, and pilotage rates for the Grays Harbor pilotage district.
- 296-116-300 Pilotage rates for the Puget Sound pilotage district.
- 296-116-320 Repealed.
- 296-116-360 Exempt vessels.
- 296-116-370 System of specified disciplinary or corrective actions.
- 296-116-400 Procedure for request by steamship company or agent that certain pilots not be assigned to certain vessels for specific safety reasons.
- 296-116-410 Definition of Grays Harbor pilotage district.
- 296-116-420 Summary/temporary license suspension.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

- 296-116-320 Retirement fund contribution. [Statutory Authority: RCW 88.16.035. 83-05-049 (Order 83-2, Resolution No. 83-2), § 296-116-320, filed 2/16/83; 82-13-087 (Order 82-10-049, Resolution No. 82-10-049), § 296-116-320, filed 6/23/82; 80-03-081 (Order 79-6, Resolution No. 79-6), § 296-116-320, filed 3/4/80. Statutory Authority: Chapter 88.16 RCW and 1977 ex. sess. c 337, §§ 1 and 4. 78-02-008 (Order 78-1), § 296-116-320, filed 1/6/78, effective 2/10/78; Order 77-18, § 296-116-320, filed 9/20/77, effective 11/1/77; Order 76-24, § 296-116-320, filed 7/22/76; Order 76-12, § 296-116-320, filed 4/22/76; Order 73-8, § 296-116-320, filed 6/20/73 and Emergency Order 73-10, filed 7/19/73, effective 8/14/73; Order 70-7, § 296-116-320, filed 7/16/70; 7/25/67.] Repealed by 88-10-039 (Order 88-11, Resolution No. 88-11), filed 5/3/88. Statutory Authority: RCW 88.16.035.

WAC 296-116-020 Special meeting. A special meeting of the board of pilotage commissioners may be called by the presiding officer, or by a majority of the members of the board, by delivering personally or by mail written notice to all other members of the board at least twenty-four hours before the time of such meeting as specified in the notice. The notice calling a special meeting shall state the purpose for which the meeting is called and the date, hour, and place of such meeting and all provisions of chapter 42.30 RCW shall apply.

[Statutory Authority: RCW 88.16.035. 88-09-025 (Order 88-3, Resolution No. 88-3), § 296-116-020, filed 4/14/88. Statutory Authority: RCW 88.16.035 and 88.16.155. 78-09-057 (Order 78-2, Resolution No. 78-2), § 296-116-020, filed 8/23/78; Order 2-68, § 296-116-020, filed 11/1/68; § 2, effective 11/25/58.]

WAC 296-116-030 Emergency meeting. If, by reason of an emergency, there is a need for expedited action by the board to meet the emergency, the presiding officer may provide for a meeting site, and the notice requirements of chapter 42.30 RCW shall be suspended during such emergency. To the extent possible, notice of such emergency meeting will be delivered personally, by telephone, telegram, or mail to the members of the board and interested persons, and shall specify the time and place of the emergency meeting and the business to be transacted. Any action taken by the board at such emergency meeting may be reconsidered by the board at its next regular monthly meeting.

[Statutory Authority: RCW 88.16.035. 88-09-026 (Order 88-4, Resolution No. 88-4), § 296-116-030, filed 4/14/88. Statutory Authority: RCW 88.16.035 and 88.16.155. 78-09-057 (Order 78-2, Resolution No. 78-2), § 296-116-030, filed 8/23/78; Order 2-68, § 296-116-030, filed 11/1/68; § 3, effective 11/25/58.]

WAC 296-116-070 Collection of fees. All pilots shall pay an annual license fee of one thousand five hundred dollars for every year in which they perform any pilotage services. If a licensed pilot does not perform pilotage services during a license year, his fee for that year shall be reduced to five hundred dollars upon application to the board. The board of pilotage commissioners shall receive all fees for licenses or for other purposes and make proper accounting of same and transmit all such funds to the pilotage account.

[Statutory Authority: RCW 88.16.035, 88-14-063 (Order 88-13, Resolution No. 88-13), § 296-116-070, filed 7/1/88. Statutory Authority: RCW 88.16.090, 85-15-032 (Order 85-1, Resolution No. 85-1), § 296-116-070, filed 7/12/85; 84-11-056 (Order 84-4, Resolution No. 84-4), § 296-116-070, filed 5/18/84. Statutory Authority: RCW 88.16.035, 82-24-010 (Order 82-8, Resolution No. 82-8), § 296-116-070, filed 11/18/82; 79-11-063 (Order 79-5, Resolution No. 79-5), § 296-116-070, filed 10/18/79. Statutory Authority: RCW 88.16.035 and 88.16.155, 78-09-057 (Order 78-2, Resolution No. 78-2), § 296-116-070, filed 8/23/78; Order 2-68, § 296-116-070, filed 11/1/68; § 7, effective 11/25/58.]

WAC 296-116-080 Licensing of pilots. (1) No person shall be licensed by the board unless he has applied for a pilotage license and successfully completed: (a) The pilotage examination; (b) familiarization trips required by the board; and (c) the pilotage training program, if applicable.

The majority of the entire board shall pass on the licensing of a pilot and licenses shall be signed by the chairperson. All applicants shall have and display a United States Government Masters License and a first class United States endorsement without restrictions on that license to pilot in whichever pilotage district the applicant desires a license. In addition all applicants shall have and display an endorsement to their masters license issued by the United States Coast Guard certifying competence as a radar observer.

(2) Prior to commencing familiarization trips, and the pilot training program, if applicable, an applicant must pass a written and oral examination given and graded by the board. The board will conduct such examinations for both pilotage districts during the month of April in each odd-numbered year. Notice of the examination shall be published four months in advance by one paid advertisement in a major newspaper and written notice to one radio station, one television station, United Press International, and the Associated Press, as well as all pilots licensed by the board and all operators registered with the board. Applications will be accepted by the board immediately following the publication of the notice of the examination. The board may, in an emergency, call for an immediate examination on less than four months notice.

(a) The examination may be taken by all qualified applicants who:

(i) Have had a license application on file with the board for at least one month prior to the examination. (This requirement may be waived upon the showing of good cause;)

(ii) Have tendered a nonrefundable examination fee of three hundred dollars. The board may, at its discretion,

refund the examination fee for an applicant who is unable to sit for the examination.

(iii) Have had a physical examination by a physician designated by the board not more than thirty days prior to the examination to determine his physical fitness to be a pilot.

(b) The examination shall be in compliance with RCW 88.16.090 and shall consist of questions covering, but not limited to, the following subjects as they pertain to the pilotage district for which the examination is being given:

(i) Rules of the road as set forth in United States government publications;

(ii) Aids to navigation;

(iii) Courses, distances, and distance past abeam at change-of-course points, course points within channels, waterways, and navigable tributaries within the pilotage district for which the examination is being given;

(iv) Cable crossing areas;

(v) Channel and passage widths, depths and shoal areas;

(vi) Bridge signals - width, regulations, and closed periods;

(vii) Ship handling, docking and undocking problems, use of towboats and anchors, and seamanship;

(viii) Vessel traffic system regulations where applicable;

(ix) Ranges for determining compass error and measured miles;

(x) Channel ranges;

(xi) Engine and rudder order commands for United States and foreign merchant vessels and United States naval vessels;

(xii) Operation and use of marine radar, including rapid plotting techniques;

(xiii) Knowledge of tidal currents and ability to calculate currents and tides;

(xiv) Pier, wharf, or terminal locations and berth numbers; dock or pier headings, lengths, and minimum depths of water alongside;

(xv) Prohibited areas, restricted areas, and explosive anchorages;

(xvi) Use of navigational and bridge instruments;

(xvii) Anchorage locations;

(xviii) Duties of pilot;

(xix) Relationship between pilot and master;

(xx) Location and meaning of storm warning signals;

(xxi) Meaning of one and two flag signals;

(xxii) United States government public health quarantine regulations;

(xxiii) Harbor regulations;

(xxiv) Washington State Pilotage Act and rules of the board of pilotage commissioners;

(xxv) Chart knowledge, including chart symbols and abbreviations as set forth in the latest department of commerce NOS (National Ocean Survey) Chart No. 1.

(3) After successful completion of the examination, the board shall determine the number of familiarization trips which the applicant will have to make pursuant to

RCW 88.16.090. Familiarization trips are ship movements over specified routes on which the applicant observes the route and the actions of the licensed pilot on board.

(4) After passing the examination, applicants for the Puget Sound pilotage district must enter and successfully complete a familiarization and training program. In this program applicants shall be required to pilot vessels under the supervision of Puget Sound pilots with more than five years experience. After every such assignment the supervisory pilots shall fill out, on a form provided by the board, an evaluation of the applicant's performance. After completion of the training period, the board shall evaluate the applicant's performance in shiphandling skills on the basis of these forms and other relevant information and decide whether the applicant should be licensed. Dependent on the applicant's experience level and grade of license, applicants in this training program shall pilot under such supervision for a minimum period of four months and seventy-five assignments and a maximum period of six months and one hundred assignments. Some or all of the familiarization trips required by RCW 88.16.090(7) may, at the board's discretion, be combined with trips during which the applicant is piloting the vessel under the supervision of a licensed pilot.

[Statutory Authority: RCW 88.16.090. 88-10-037 (Order 88-9, Resolution No. 88-9), § 296-116-080, filed 5/3/88. Statutory Authority: RCW 88.16.035. 86-07-010 (Order 86-2, Resolution No. 86-2), § 296-116-080, filed 3/10/86. Statutory Authority: RCW 88.16.090. 82-15-028 (Order 82-7, Resolution No. 82-7), § 296-116-080, filed 7/14/82; 81-21-019 (Order 81-4, Resolution No. 81-4), § 296-116-080, filed 10/13/81. Statutory Authority: RCW 88.16.035. 80-03-081 (Order 79-6, Resolution No. 79-6), § 296-116-080, filed 3/4/80; 79-11-063 (Order 79-5, Resolution No. 79-5), § 296-116-080, filed 10/18/79; 79-05-023 (Order 79-2, Resolution No. 79-2), § 296-116-080, filed 4/17/79; Order 75-8, § 296-116-080, filed 3/10/75; Order 73-6, § 296-116-080, filed 5/11/73; Order 2-68, § 296-116-080, filed 11/1/68; § 8, effective 11/25/58.]

WAC 296-116-083 Examination review and appeal procedures. (1) Any candidate who takes the state examination for licensure may request a review by the board of his or her examination results. This request must be in writing and must be received by the board within fifteen days of receipt of notification of the examination results. The board will not set aside its prior determination unless the candidate proves the challenged score was the result of fraud, coercion, arbitrariness or manifest unfairness by the board. The board will not consider any challenges to examination scores unless the total revised score could result in a higher ranking to enter the training program or a passing grade on the pilotage examination.

(2) The procedure for filing a review is as follows:

(a) Contact the board office for an appointment to appear personally to review incorrect answers on the examination.

(b) The candidate will be provided a form to complete in the board office in defense of the examinee's examination answers.

(c) The candidate must state the specific reason or reasons why the candidate feels the results of the examination should be changed.

(d) The candidate will be identified only by candidate number for the purpose of this review. Letters of reference or requests for special consideration will not be read or considered by the board.

(e) Candidates may not bring in notes or texts for use while completing the informal review form.

(f) Candidates will not be allowed to take any notes or materials from the office upon leaving.

(g) The board will schedule a closed session meeting to review the examinations and forms completed by the candidate for the purpose of informal review.

(h) The candidates will be notified in writing of the results.

(3) Any candidate who is not satisfied with the result of the examination review may request a formal hearing pursuant to RCW 88.16.100. Such hearing must be requested within thirty days of receipt of the result of the board's review of the examination results.

[Statutory Authority: RCW 88.16.035. 88-10-038 (Order 88-10, Resolution No. 88-10), § 296-116-083, filed 5/3/88.]

WAC 296-116-120 Physical requirements. (1) In order to determine the physical fitness of persons to serve as licensed pilots under the provisions of the pilotage act, all licensed pilots and applicants shall be required to pass a general physical examination annually within forty-five days prior to the date their annual state pilot license fee is due. As part of this examination pilots and applicants shall have completed on a form provided by the board a detailed report of physical examination. This form shall be prepared by the examining physician and shall be submitted to the board along with a letter stating whether and under what conditions the pilot or applicant is capable of providing pilotage services. The completion of the form and the letter to the board satisfies the minimum health standards of RCW 88.16.090(6). The detailed report of physical examination is a confidential record and will not be available for public inspection. Such examination shall be obtained at the expense of the licensed pilots or applicants from a physician or physicians designated in advance by the board. The secretary of the board shall give each pilot or applicant reasonable written notice of the date when any such physical examination becomes due and shall specify the name of the physicians then approved by the board to conduct such physical examination.

(2) The physical examination required of all pilots and applicants shall demonstrate that he is in all respects physically fit to perform his duties as a pilot. The examination shall assure that one's abilities as a pilot will not be impaired by eyesight, hearing or other bodily function and shall include examination of the pilot's or applicant's eyes (including tests for color blindness, depth perception, night vision, disease, field of vision and reflexes); ears; heart; blood pressure; blood components; pulse; speech capabilities; history of diseases (including diabetes, cancer, arthritis, arrhythmia, asthma, bronchitis, emphysema, ulcers, alcoholism and other illnesses)

and any other type of information which the physician feels is relevant.

(3) In the case of renewal of license as pilot, should the pilot be temporarily physically incapacitated at the time his license is due to be renewed, the commission shall not revoke such license until a further physical examination to be given at the expiration of three months. This procedure shall be carried on until it is evident that the pilot is permanently incapacitated; provided further, that no pilot shall be carried on the inactive list for longer than one year if disabled. Any pilot who is physically incapacitated shall not serve as a pilot during such period of incapacitation.

[Statutory Authority: RCW 88.16.090. 88-09-027 (Order 88-5, Resolution No. 88-5), § 296-116-120, filed 4/14/88; 85-15-033 (Order 85-2, Resolution No. 85-2), § 296-116-120, filed 7/12/85. Statutory Authority: RCW 88.16.035 and 88.16.090(6). 80-16-005 (Resolution No. 79-5), § 296-116-120, filed 10/23/80. Statutory Authority: RCW 88.16.035. 79-11-063 (Order 79-5, Resolution No. 79-5), § 296-116-120, filed 10/18/79; Order 73-6, § 296-116-120, filed 5/11/73; Order 2-68, § 296-116-120, filed 11/1/68; § 12, effective 11/25/58.]

WAC 296-116-175 Tariff proposals. The board of pilotage commissioners has been charged with certain statutory duties by RCW 88.16.035. To assist the board in its responsibilities to provide for the maintenance of efficient and competent pilotage services and to annually fix the pilotage tariffs for pilotage services to be performed on the waters covered by chapter 88.16 RCW, it shall be the policy that licensed pilots, ship operators, and interested members of the public may jointly or separately present tariff proposals to the board for its consideration. To that end, individual Washington state licensed pilots, independent ship owners or operators, members of the public and/or agents, committees or organizations representing said persons or corporations are authorized to meet, discuss, and prepare joint or separate tariff proposals for board consideration. They may appear before the board to support or oppose any such proposal, or part thereof, but the final determination, adoption and active supervision of the rates, charges, expense items, and classifications to be contained in said pilotage tariffs and the rules, regulations, or procedures to implement said annual tariffs shall be made by the board.

[Statutory Authority: RCW 88.16.035. 87-19-100 (Order 87-1, Resolution No. 87-1), § 296-116-175, filed 9/17/87.]

WAC 296-116-185 Tariffs, and pilotage rates for the Grays Harbor pilotage district. The following rates shall become effective on March 21, 1988.

CLASSIFICATION OF PILOTAGE SERVICE RATE

Piloting of vessels in the inland waters and tributaries of Grays Harbor:

Each vessel shall be charged according to its draft and tonnage. The draft charges shall be \$38.56 per meter (or \$11.75 per foot) and the tonnage charge shall be \$0.1230 per net registered ton. The minimum net registered tonnage charge is \$430.00. The charge for an extra vessel (in case of tow) is \$246.00.

Boarding fee:

Per each boarding/deboarding from a boat \$ 185.00
Boat fee surcharge per each boarding/deboarding from a boat \$ 25.00

Harbor shifts:

For each shift from dock to dock, dock to anchorage, anchorage to dock, or anchorage to anchorage \$ 308.00
Delays per hour \$ 74.00
Cancellation charge (pilot only) \$ 123.00
Cancellation charge (pilot boat only) . . . \$ 369.00

Travel allowance:

Boarding or deboarding a vessel off Grays Harbor entrance \$ 57.00
Pilot when traveling to an outlying port to join a vessel or returning through an outlying port from a vessel which has been piloted to sea shall be paid \$430.00 for each day or fraction thereof, and the travel expense incurred \$ 430.00

Bridge transit:

Charge for each bridge transited \$ 135.00

Miscellaneous:

The balance of amounts due for pilotage rates not paid within 45 days of invoice will be assessed at 1 1/2% per month late charge. At least a four hour notice shall be given for an arrival, sailing, or change of ETA or ETD.

[Statutory Authority: RCW 88.16.035. 88-05-043 (Order 88-2, Resolution No. 88-2), § 296-116-185, filed 2/17/88, effective 3/21/88. Statutory Authority: RCW 88.16.035(4). 87-01-081 (Orders 86-9 and 86-10, Resolution Nos. 86-9 and 86-10), § 296-116-185, filed 12/19/86; 85-02-048 (Order 84-5, Resolution No. 84-5), § 296-116-185, filed 12/31/84; 83-15-012 (Order 83-3, Resolution No. 83-3), § 296-116-185, filed 7/12/83; 82-08-016 (Order 82-1, Resolution No. 82-1), § 296-116-185, filed 3/29/82; 81-07-009 (Order 81-1, Resolution No. 81-1), § 296-116-185, filed 3/6/81; 80-03-081 (Order 79-6, Resolution No. 79-6), § 296-116-185, filed 3/4/80; Order 2-68, § 296-116-185, filed 11/1/68.]

WAC 296-116-300 Pilotage rates for the Puget Sound pilotage district. These rates shall become effective on March 18, 1988.

CLASSIFICATION	RATE
Ship length overall (LOA) Charges:	per LOA rate schedule in this section
Boarding fee: Per each boarding/deboarding at the Port Angeles pilot station.	\$ 25.00
Harbor shift - Live ship (Seattle Port)	LOA Zone I
Harbor shift - Live ship (other than Seattle Port)	LOA Zone I
Harbor shift - Dead ship	Double LOA Zone I
Dead ship towing charge: LOA of tug + LOA of tow + beam of tow Any tow exceeding seven hours, two pilots are man- datory. Harbor shifts shall constitute and be limited to those services in moving vessels from dock to dock, from anchorage to dock, from dock to anchor- age, or from anchorage to anchorage in the same port after all other applicable tariff charges for pi- lotage services have been recognized as payable.	Double LOA Zone
Waterway and bridge charges: Ships up to 90' beam: A charge of \$132.00 shall be in addition to bridge fees for any vessel movements both inbound and outbound required to transit south of Spokane Street Bridge in Seattle, south of Eleventh Street Bridge in any of the Tacoma waterways, in Port Gamble, or in the Snohomish River. Any vessel movements required to transit through bridges shall have an additional charge of \$63.00 per bridge.	
Ships 90' beam and/or over: A charge of \$178.00 shall be in addition to bridge fees for any vessel movements both inbound and outbound required to transit south of Spokane Street Bridge in Seattle and south of Eleventh Street Bridge in any of the Tacoma waterways. Any vessel movements required to transit through bridges shall have an additional charge of \$125.00 per bridge. (The above charges shall not apply to transit of ves- sels from Shilshole Bay to the limits of Lake Washington.)	
Two pilots required: In a case where two pilots are employed for a single vessel waterway or bridge transit, a second pilot charge shall include the bridge and waterway charge in addition to the harbor shift rate.	
Compass adjustment	\$177.00
Radio direction finder calibration	\$177.00
Launching vessels	\$267.00
Trial trips, 6 hours or less (Minimum \$504.00)	\$ 84.00 per hr.
Trial trips, over 6 hours (two pilots)	\$168.00 per hr.
Shilshole Bay - Salmon Bay	\$104.00
Salmon Bay - Lake Union	\$ 82.00
Lake Union - Lake Washington (plus LOA zone from Webster Point)	\$104.00
Cancellation charge	LOA Zone I
Cancellation charge - Port Angeles (when pilot is or- dered and vessel proceeds without stopping for pi- lot.)	LOA Zone I

CLASSIFICATION	RATE
Docking delay after anchoring: Applicable harbor shift rate to apply, plus \$84.00 per hour standby. No charge if delay is 60 minutes or less. If the delay is more than 60 minutes, charge is \$84.00 for every hour or fraction thereof.	\$ 84.00 per hr.
Sailing delay: No charge if delay is 60 minutes or less. If the de- lay is more than 60 minutes, charge is \$84.00 for every hour or fraction thereof.	\$ 84.00 per hour
Slowdown: When a vessel chooses not to maintain its normal speed capabilities for reasons determined by the ves- sel and not the pilot, and when the difference in ar- rival time is one hour, or greater, from the predicted arrival time had the vessel maintained its normal speed capabilities, a charge of \$84.00 per hour, and each fraction thereof, will be assessed for the result- ant difference in arrival time.	
Super ships: 20,000 to 50,000 gross tons: Additional charge to LOA zone mileage of \$0.0443 a gross ton for all gross tonnage in excess of 20,000 gross tons up to 50,000 gross tons. 50,000 gross tons and up: In excess of 50,000 gross tons, the charge shall be \$0.0530 per gross ton.	
For vessels where a certificate of international gross ton- nage is required, the appropriate international gross tonnage shall apply.	
Delayed arrival-Port Angeles:	\$ 84.00 per hour
When a pilot is ordered for an arriving inbound vessel at Port Angeles and the vessel does not arrive within two hours of its ETA, or its ETA is amended less than six hours prior to the original ETA, a charge of \$84.00 for each hour delay, or fraction thereof, shall be assessed in addition to all other appropriate charges.	
Transportation to vessels on Puget Sound:	
March Point or Anacortes	\$ 112.00
Bangor	65.00
Bellingham	124.00
Bremerton	34.00
Cherry Point	146.00
Dupont	65.00
Edmonds	23.00
Everett	42.00
Ferndale	134.00
Manchester	51.00
Mukilteo	41.00
Olympia	84.00
Point Wells	23.00
Port Gamble	60.00
Port Townsend (Indian Island)	85.00
Semiahmoo (Blaine)	153.00
Tacoma	43.00
Tacoma Smelter	49.00
Winslow	34.00
(a) Interport shifts: Transportation paid to and from both points.	

CLASSIFICATION

RATE

- (b) Intraharbor shifts: Transportation to be paid both ways. If intraharbor shift is cancelled on or before scheduled reporting time, transportation paid one way only.
- (c) Cancellation: Transportation both ways unless notice of cancellation is received prior to scheduled reporting time in which case transportation need only be paid one way.
- (d) Any new facilities or other seldom used terminals, not covered above, shall be based on mileage x \$1.60 per mile.

Delinquent payment charge: 1 1/2% per month after 45 days from first billing.

Nonuse of pilots: Ships taking and discharging pilots without using their services through all Puget Sound and adjacent inland waters shall pay full pilotage fees on the LOA zone mileage basis from Port Angeles to destination, from place of departure to Port Angeles, or for entire distance between two ports on Puget Sound and adjacent inland waters.

LOA rate schedule

The following rate schedule is based upon distances furnished by National Oceanic and Atmospheric Administration, computed to the nearest half-mile and includes retirement fund contributions.

LOA	ZONE I Intra Harbor	ZONE II 0-30 Miles	ZONE III 31-50 Miles	ZONE IV 51-75 Miles	ZONE V 76-100 Miles	ZONE VI 101 Miles & Over
Up to 449	125	195	339	508	685	891
450 - 459	127	200	342	516	695	894
460 - 469	131	203	345	523	706	898
470 - 479	136	207	350	535	709	901
480 - 489	139	212	352	544	714	904
490 - 499	142	214	356	554	721	909
500 - 509	148	218	362	562	727	915
510 - 519	150	223	366	569	733	918
520 - 529	152	231	372	572	740	927
530 - 539	158	234	377	578	752	936
540 - 549	161	238	383	585	765	944
550 - 559	164	244	386	593	771	953
560 - 569	170	254	394	598	779	963
570 - 579	173	258	398	600	786	969
580 - 589	180	262	405	605	792	980
590 - 599	188	267	408	609	802	990
600 - 609	195	275	414	611	811	996
610 - 619	206	278	421	615	820	1005
620 - 629	215	282	427	619	829	1015
630 - 639	226	288	431	621	836	1026
640 - 649	236	294	436	624	846	1033
650 - 659	250	300	443	629	855	1043
660 - 669	258	303	448	632	864	1051
670 - 679	265	310	452	643	873	1058
680 - 689	270	316	458	650	881	1068
690 - 699	278	321	463	661	891	1089
700 - 719	291	331	473	668	907	1103
720 - 739	308	342	484	677	927	1121
740 - 759	321	356	495	685	944	1141
760 - 779	334	371	506	695	963	1157
780 - 799	350	384	516	706	980	1177
800 - 819	364	398	525	711	996	1194
820 - 839	377	411	537	721	1015	1209
840 - 859	393	428	548	729	1033	1229
860 - 879	406	443	559	749	1051	1246
880 - 899	421	457	569	766	1068	1265
900 - 919	434	470	579	784	1089	1283
920 - 939	449	484	593	802	1103	1300

LOA	ZONE I Intra Harbor	ZONE II 0-30 Miles	ZONE III 31-50 Miles	ZONE IV 51-75 Miles	ZONE V 76-100 Miles	ZONE VI 101 Miles & Over
940 - 959	463	498	601	820	1121	1317
960 - 979	476	513	613	836	1141	1336
980 - 999	493	525	622	855	1157	1353
1000 & over	506	543	634	873	1177	1371

[Statutory Authority: RCW 88.16.050. 88-05-039 (Order 88-1, Resolution No. 88-1), § 296-116-300, filed 2/16/88, effective 3/18/88. Statutory Authority: RCW 88.16.035(4). 87-01-081 (Orders 86-9 and 86-10, Resolution Nos. 86-9 and 86-10), § 296-116-300, filed 12/19/86; 86-19-066 (Order 86-6, Resolution No. 86-6), § 296-116-300, filed 9/16/86; 86-02-035 (Order 86-1, Resolution No. 86-1), § 296-116-300, filed 12/30/85; 85-02-048 (Order 84-5, Resolution No. 84-5), § 296-116-300, filed 12/31/84; 84-04-006 (Order 84-1, Resolution No. 84-1), § 296-116-300, filed 1/20/84; 83-17-055 (Order 83-6, Resolution No. 83-6), § 296-116-300, filed 8/17/83; 82-13-065 (Order 82-4, Resolution No. 82-4), § 296-116-300, filed 6/16/82. Statutory Authority: RCW 88.16.035. 81-12-017 (Order 81-2, Resolution No. 81-2), § 296-116-300, filed 5/29/81; 80-06-084 (Order 80-1, Resolution No. 80-1), § 296-116-300, filed 5/28/80. Statutory Authority: RCW 88.16.035(4). 79-07-033 (Order 79-4, Resolution No. 79-4), § 296-116-300, filed 6/19/79. Statutory Authority: Chapter 88.16 RCW and 1977 ex. sess. c 337, §§ 1 and 4. 78-02-008 (Order 78-1), § 296-116-300, filed 1/6/78, effective 2/10/78; Order 77-18, § 296-116-300, filed 9/20/77, effective 11/1/77; Order 76-24, § 296-116-300, filed 7/22/76; Order 75-3, § 296-116-300, filed 2/10/75; Order 74-2, § 296-116-300, filed 1/8/74; Order 73-8, § 296-116-300, filed 6/20/73 and Emergency Order 73-10, filed 7/19/73, effective 8/14/73; Order 70-7, § 296-116-300, filed 7/16/70; 7/25/67; 2/18/64; 10/29/62; 12/28/60; 3/23/60.]

WAC 296-116-320 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-116-360 Exempt vessels. Under the authority of RCW 88.16.070, application may be made to the board of pilotage commissioners to seek exemption from the pilotage requirements for the operation of a limited class of small passenger vessels or yachts, which are not more than five hundred gross tons (international), do not exceed two hundred feet in length, and are operated exclusively in the waters of the Puget Sound pilotage district and lower British Columbia. The owners or operators of such vessel or vessels must:

(1) Seek exemption at least sixty days prior to planned vessel operations in the Puget Sound pilotage district.

(2) Submit the petition requesting exemption to the chairperson, Washington state board of pilotage commissioners, with details concerning description of the vessel, the contemplated use of vessel, the proposed area of operation, the name and address of the vessel's owner, and the dates of planned operations. The board shall hold a hearing at a regularly scheduled board meeting to consider such exemption request.

The board, when granting such an exemption, may establish such conditions they deem necessary so that such an exemption shall not be detrimental to the public interest in regard to safe operation preventing loss of human lives, loss of property, and protecting the marine environment of the state of Washington.

One such condition shall be that the master of the vessel, shall at all times, hold as a minimum, a United States government license as a master near coastal of steam or motor vessel of not more than sixteen hundred gross tons (inspected vessel).

The board shall annually, or at any other time when in the public interest, review any exemptions granted to the specified class of small vessels to ensure that each exempted vessel remains in compliance with the original exemption and any conditions to the exemption. The board shall have the authority to revoke such exemption when there is not continued compliance with the requirements for exemption.

[Statutory Authority: RCW 88.16.070. 88-09-015 (Order 88-6, Resolution No. 88-6), § 296-116-360, filed 4/13/88.]

WAC 296-116-370 System of specified disciplinary or corrective actions. When a pilot has received multiple disciplinary actions pursuant to RCW 88.16.100 (1) and/or (2) within any two-year period, the board shall evaluate the pilot and prepare and personally serve upon him a notice advising of the board's intended action, the specific ground therefore, and the right to request a hearing pursuant to RCW 88.16.100(4) to challenge the board's action. Such intended action may include the temporary suspension of the pilot from duties until such pilot has satisfactorily completed subsection (1) or (2) of this section:

(1) An approved course-of-study which may include navigation training and testing; or

(2) Any remedial activity or treatment designated by the board to assure fitness and competence for full pilotage duties.

In ordering such disciplinary action, the board shall take into account both the causes of the previous disciplinary actions and the pilot's previous record.

Failure to enter into such corrective action within thirty days of the board's action may be cause for revocation of the pilot's license.

In the event of a temporary license suspension, license reinstatement and resumption of pilotage duties shall not be authorized until the board has reviewed completed activity and formally extended approval. Such approval shall not be unreasonably withheld by the board and shall be reviewed and acted upon within five days of the completion of the activity.

[Statutory Authority: RCW 88.16.100. 88-14-062 (Order 88-14, Resolution No. 88-14), § 296-116-370, filed 7/1/88.]

WAC 296-116-400 Procedure for request by steamship company or agent that certain pilots not be assigned to certain vessels for specific safety reasons. When a steamship company or agent believes a particular pilot should not be assigned to pilot that company's vessels for specific safety reasons, a detailed written request, limited to specific safety concerns, may be submitted to the board. In order to be considered, the request must be submitted within ten days of the alleged act or omission causing their specific safety concern.

The board shall investigate the request and shall conduct a hearing at a regularly scheduled board meeting

not more than sixty days following receipt of the request and notification of interested persons. The pilot shall be notified in writing and provided with documentation in accordance with WAC 296-11-450. The board shall notify the steamship company or agent and pilot in writing of its subsequent decision and reasons therefore.

In the event that the request is approved, the board shall give the affected pilot a specific list of vessels for which that pilot shall not provide pilotage services as well as the length of time covering such restriction.

[Statutory Authority: RCW 88.16.035. 88-09-016 (Order 88-7, Resolution No. 88-7), § 296-116-400, filed 4/13/88.]

WAC 296-116-410 Definition of Grays Harbor pilotage district. The Grays Harbor pilotage district shall have an outer boundary line between Grays Harbor and Willapa Harbor and the high seas which shall be seaward of a line from Point Brown rear range light to Grays Harbor entrance lighted whistle buoy number three, (latitude N 46-55.00, longitude 124-14.42 W), thence to Grays Harbor entrance lighted whistle buoy number two (latitude N 46-52.43, longitude 124-12.35 W), thence to Grays Harbor light and from the Willapa Bay light to the Willapa Bay approach lighted whistle buoy "W" (latitude N 46-41.50, longitude 124-10.46 W), thence to the charted northern-most position of Leadbetter Point.

[Statutory Authority: RCW 88.16.050. 88-09-017 (Order 88-8, Resolution No. 88-8), § 296-116-410, filed 4/13/88.]

WAC 296-116-420 Summary/temporary license suspension. Summary/temporary suspension of a pilot's license may be made by the chairperson or vice-chairperson of the board of pilotage commissioners when:

(1) A pilot has been involved in any vessel accident where there has been major property damage, loss of life, or loss of a vessel; or

(2) Where there is a reasonable cause to believe that a pilot has diminished capacity or is under the influence of drugs, alcohol, or other substances; and

(3) Such an accident or physical or mental impairment would significantly diminish that pilot's ability to carry out pilotage duties and that the public health, safety, and welfare requires such emergency action. Notification of this suspension shall be made directly to the pilot and the appropriate pilot's association.

Within seventy-two hours an emergency board meeting will be held to determine whether to continue such suspension. In the event the suspension is continued pending proceedings for revocation or other action, an order shall be immediately prepared and notice shall be personally served upon the pilot advising of the board's action.

These further proceedings shall be promptly instituted in the office of administrative hearings.

All final decisions of the administrative law judge shall be subject to review by the superior court of the state of Washington for Thurston County or by the superior court of the county in which the pilot maintains his residence or principal place of business, to which court any case with all the papers and proceedings

therein shall be immediately certified by the administrative law judge if requested to do so by any party to the proceedings at any time within thirty days after the date of such final decision. No appeal may be taken after the expiration of thirty days after the date of final decision.

[Statutory Authority: RCW 88.16.100, 88-10-040 (Order 88-12, Resolution No. 88-12), § 296-116-420, filed 5/3/88.]

Chapter 296-127 WAC PREVAILING WAGE

WAC

296-127-010	Definitions for chapter 296-127 WAC.
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296-127-023	Building service maintenance.
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WAC 296-127-010 Definitions for chapter 296-127 WAC. (1) "Department" means the department of labor and industries.

(2) "Director" means the director of the department or his or her duly authorized deputy or representative.

(3) "Industrial statistician" means the industrial statistician of the department's employment standards, apprenticeship, and crime victims division.

(4) "Assistant director" means the assistant director of the employment standards, apprenticeship, and crime victims (ESAC) division or his or her duly authorized deputy or representative.

(5) "Contractor" includes subcontractor.

(6) The term "public work" shall include all construction, alteration, enlargement, improvement, repair, and demolition to which any agency of the state of Washington or any agency of a county, city, town, or any other political subdivision, or a public district, is a party, whether such work is executed by contract, purchase order, or any other legal agreement, provided the contracting agency owns the asset which is constructed, altered, enlarged, improved, repaired, or demolished. The public entity which is the source of the funding shall have no bearing on the term public work.

Public work shall also include facilities of new construction which are caused by state agencies to be built by a private party through a contract to rent, lease, or purchase at least eighty percent of such facility for occupation by a state agency as required by chapter 43.19 RCW.

Public work shall also include maintenance, except ordinary maintenance, when performed by contract. For the purpose of this section, maintenance is defined as

keeping existing facilities in good usable condition, without repairing damages or breaks. The term contract shall mean a contract in writing for the execution of public work for a fixed or determinable amount duly awarded after advertisement and competitive bid. However, a contract which is awarded from a small works roster need not be advertised.

(7) "Residential construction" means construction, alteration, repair, improvement, or maintenance of single family dwellings, duplexes, apartments, condominiums, and other residential structures not to exceed four stories in height, including basement, when used solely as permanent residences. It does not include the utilities construction (water and sewer lines), or work on streets, or work on other structures (e.g., for recreation and business.)

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270, 88-22-046 (Order 88-22), § 296-127-010, filed 10/31/88. Statutory Authority: RCW 39.12.050, 39.12.065, 43.22.270 and 51.04.020, 86-03-063 (Order 85-28), § 296-127-010, filed 1/17/86. Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38, 82-18-041 (Order 82-28), § 296-127-010, filed 8/27/82.]

WAC 296-127-011 Time for determining prevailing wage. (1) Prevailing wage rates for all contracts will be determined by the department and published only on the first business day of February and the first business day of August of each year. All prevailing wage rates become effective thirty days after they are published. Awarding agencies must include a schedule of the applicable published prevailing wage rates in the contract documents for each contract. Contractors must include a schedule of the applicable published prevailing wage rates in their contracts with each one of their subcontractors.

(2) For all contracts, except building service maintenance contracts, the prevailing wage rates which are in effect on the date when the bids by the prime contractors are required to be submitted to the contract awarding public agency are the prevailing wage rates which must be paid for the duration of the contract. If the contract is not awarded within six months of this date, the prevailing wage rates which are in effect on the date when the contract is awarded are the prevailing wage rates which must be paid for the duration of the contract.

(3) If an agreement for public works is not awarded pursuant to bids, the prevailing wages which are in effect on the date when the agreement is executed are the prevailing wages which must be paid for the duration of the agreement.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270, 88-22-046 (Order 88-22), § 296-127-011, filed 10/31/88. Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38, 82-18-041 (Order 82-28), § 296-127-011, filed 8/27/82.]

WAC 296-127-013 Scope of work definitions. In order for the industrial statistician to determine applicable prevailing wage rates, scope of work definitions are needed for each trade and occupation.

(1) The industrial statistician may promulgate scope of work descriptions, using authoritative sources available to the department, such as, but not limited to:

- (a) Washington state apprenticeship and training council approved apprenticeship standards;
- (b) Collective bargaining agreements;
- (c) Dictionary of occupational titles;
- (d) Experts from organized labor, licensed contractors, and contractors' associations.

(2) Scope of work definitions may be revised only on the first business day of February and the first business day of August each year. Scope of work definitions may be obtained from the department on request.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43-22.270. 88-22-046 (Order 88-22), § 296-127-013, filed 10/31/88.]

WAC 296-127-014 Usual benefits. "Usual benefits" are limited to the following:

(1)(a) Health and welfare payments. This is group medical insurance, which may include dental, vision, and life insurance. (State or federal statutorily mandated insurance programs providing protection against industrial accidents, occupational illnesses, and all related mandatory forms of protection, shall not qualify as health and welfare insurance.)

(b) Pension contributions made into pension plans for which the Internal Revenue Service has issued a letter of acceptance or approval.

(c) Vacation payments made either directly to the employees or into a vacation fund, provided these benefits are paid to the employees.

(d) Apprentice training fund. Payments made to training programs approved or recognized by the Washington state apprenticeship and training council.

(e) Paid holidays. Payments made to employees for specified holidays.

(2) Any fringe benefits required by other local, state, or federal laws do not qualify as "usual benefits."

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43-22.270. 88-22-046 (Order 88-22), § 296-127-014, filed 10/31/88.]

WAC 296-127-015 Applicability of prevailing wages for supervisors. Determinations as to whether individuals are workers, laborers, or mechanics are based on the duties actually performed by the individuals, rather than the title of the occupations.

(1) Supervisors (e.g., foremen, general foremen, superintendents, etc.) are entitled to the prevailing rate of wage if they perform manual or physical labor for more than twenty percent of their hours worked on a public works project during any given week. Supervisors who qualify, are entitled to the journeyman rate of pay for the type of work they performed, for all hours spent performing that manual labor.

(2) If supervisors subject to the journeyman prevailing wage rate are paid a salary, the compensation (salary divided by number of hours worked) must be equal to or greater than the prevailing wage rate for the type of work performed.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43-22.270. 88-22-046 (Order 88-22), § 296-127-015, filed 10/31/88.]

WAC 296-127-016 Coverage and exemptions of workers involved in the production and delivery of materials predominantly used in road construction. The materials covered under this section are sand, gravel, crushed rock, concrete mix, asphalt, or other similar materials.

(1) For the purpose of this section, a contractor or subcontractor is defined as an employer who has contracted to perform work on a public works project site. Employers who produce and stockpile these materials for public agencies are not considered contractors for the purpose of this section. Workers who are employed by public works contractors or subcontractors are subject to the provisions of chapter 39.12 RCW when:

(a) They are engaged in the production of the above listed materials for a public works project in a sand or gravel pit, rock quarry, concrete mixing plant, or other similar facility; or

(b) They are engaged in the transportation of the above listed materials for use on the public works project, whether or not they perform any work on the project site.

(2) Workers are subject to the provisions of chapter 39.12 RCW, regardless of who their employer is, when:

(a) They deliver any of the above materials to public works construction sites and perform any spreading, leveling, rolling, or otherwise participate in any incorporation of the materials into the project; or

(b) They wait at or near the public works project site to participate in the incorporation of the materials into the project; or

(c) They remove any materials from a public works construction site pursuant to contract requirements or specifications (e.g., excavated materials, materials from demolished structures, cleanup materials, etc.); or

(d) They work in a material production facility (e.g., batch plant, borrow pit, rock quarry, etc.) which is established for a public works project near a public works construction site for the specific, but not exclusive, purpose of supplying materials for the project.

(3) Workers are not subject to the prevailing wage requirements of chapter 39.12 RCW when: They are employed by a common or contract carrier trucking company principally or exclusively engaged in the hauling or delivery of such products, and the employee's duties do not include spreading, leveling, rolling, or otherwise participating in the incorporation of the delivered materials into the project.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43-22.270. 88-22-046 (Order 88-22), § 296-127-016, filed 10/31/88.]

WAC 296-127-019 Survey methodology. (1) The industrial statistician will use two methods to establish or update prevailing wage rates. They will be:

(a) Data collected by wage surveys; and/or

(b) Wage increases stipulated in collective bargaining agreements for those trades or occupations where a recent wage survey has established that those wage rates prevail.

When wage surveys are conducted, the method will be as follows:

(2) The department will determine the identity of employers to be surveyed for a specific trade or occupation by mailing classification questionnaires to all active licensed or Washington state department of transportation and United States Department of Labor prequalified contractors.

(3) Wage survey forms will then be mailed to:

(a) Those contractors who have indicated on the questionnaire that they employ one or more of the trades being surveyed; and

(b) To union locals representing the trades being surveyed.

(4) The data from the survey forms will only be used by the department if submitted on behalf of individual contractors identified by contractor registration number.

(5)(a) If the majority of hours worked by any trade or occupation in the largest city in a county is paid at one specific wage rate, that rate is established as the prevailing wage rate.

(b) If no single wage rate is paid to the majority of workers in the same trade or occupation, the average wage rate is established as the prevailing wage rate, based on a weighted average.

(6) Any of the above parties who submit false information under this section, shall, after a determination to that effect has been issued by the director after a hearing under chapter 34.04 RCW, forfeit as a civil penalty the sum of five hundred dollars.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43-22.270. 88-22-046 (Order 88-22), § 296-127-019, filed 10/31/88.]

WAC 296-127-022 Overtime according to chapter 49.28 RCW. (1) Work performed on public works contracts will not require the payment of overtime rates for the first two hours worked in excess of eight hours per day when the employer has obtained the employee's agreement to work a four-day, ten-hour work week.

(2) For the purpose of this section an agreement must:

(a) Have been authorized by employees who bargained collectively with their employers through representatives of their own choosing; or

(b) Be obtained in writing; and

(c) Be obtained individually from each employee; and

(d) Obtained separately for each public works project; and

(e) Obtained voluntarily.

(3) It is prohibited to work more than ten hours in any calendar day on a public works project except in cases of extraordinary emergency, such as danger to life or property.

(4) Notwithstanding the above provisions, overtime must not be paid for all hours worked in excess of forty hours per week.

[Statutory Authority: RCW 43.22.270. 88-19-055 (Order 88-21), § 296-127-022, filed 9/15/88.]

WAC 296-127-023 Building service maintenance. The "public building service maintenance contracts" referred to in RCW 39.12.020 shall mean janitorial service contracts and cover only work performed by janitors, waxers, shampooers, and window cleaners.

For all building service maintenance contracts, the prevailing wage rates which are in effect on the date when the bids are required to be submitted to the contract awarding public agency are the minimum prevailing wage rates which must be paid for the first year of such contracts and thereafter. However, any building service maintenance contract of more than one year duration, must include wage increase language recognizing the potential for future variance in applicable prevailing wage(s) and specifying that the wages which a contractor shall pay its employees must be altered annually to recognize and follow the most recently promulgated increases in prevailing wages each year after the first year of the contract period. The cost of the increases in the wages due employees shall be borne by the contract awarding agency.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43-22.270. 88-22-046 (Order 88-22), § 296-127-023, filed 10/31/88.]

WAC 296-127-025 Applicability of joint federal-state standards. When a public works project is subject to the provisions of the Washington state public works law, chapter 39.12 RCW, and the Federal Davis-Bacon and related acts, the contractor and every subcontractor on that project must pay at least the Washington state prevailing wage rates, if they are higher than the federal prevailing wage rates for the project.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43-22.270. 88-22-046 (Order 88-22), § 296-127-025, filed 10/31/88.]

WAC 296-127-026 Exemptions for sole owners and their spouses, partnerships, corporations, and employees of public agencies. The prevailing wage requirements of chapter 39.12 RCW do not apply to:

(1) Sole owners and their spouses.

(2) Any partner who owns at least thirty percent of a partnership.

(3) The president, vice-president and treasurer of a corporation if each one owns at least thirty percent of the corporation.

(4) Workers regularly employed on monthly or per diem salary by the state or any political subdivision created by its laws.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43-22.270. 88-22-046 (Order 88-22), § 296-127-026, filed 10/31/88.]

WAC 296-127-040 Statement of intent to pay prevailing wages. (1) All statements of intent to pay prevailing wages for contracts in excess of two thousand five hundred dollars submitted to the industrial statistician of the department shall be accompanied by a fee of twenty-five dollars for each statement. All statements of intent to pay prevailing wages for contracts of two thousand five hundred dollars or less submitted to the department shall be accompanied by a fee of twelve dollars fifty cents for each statement. Fees shall be made payable to the department of labor and industries.

(2) Any agency, division, or department of the state of Washington which through agreement with the department certifies statements of intent for its own contracts shall provide to the industrial statistician each month the

number of statements of intent certified and quarterly shall send a fee of ten dollars for each statement of intent to pay prevailing wages it has certified. This fee shall be sent to the industrial statistician and be made payable to the department of labor and industries.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270, 88-22-046 (Order 88-22), § 296-127-040, filed 10/31/88. Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38, 82-18-041 (Order 82-28), § 296-127-040, filed 8/27/82.]

WAC 296-127-045 Affidavit of wages paid. (1) All affidavits of wages paid for contracts in excess of two thousand five hundred dollars submitted to the industrial statistician of the department shall be accompanied by a fee of twenty-five dollars for each affidavit of wages paid. All affidavits of wages paid for contracts of two thousand five hundred dollars or less submitted to the industrial statistician of the department shall be accompanied by a fee of twelve dollars fifty cents for each affidavit. All fees shall be made payable to the department of labor and industries.

(2) Any agency, division, or department of the state of Washington which through agreement with the department certifies affidavits of wages paid for its own contracts shall provide to the industrial statistician each month the number of affidavit of wages paid it has certified and quarterly shall send a fee of ten dollars for each affidavit of wages paid it has certified. This fee shall be sent to the industrial statistician and be made payable to the department of labor and industries.

[Statutory Authority: Chapters 39.04 and 39.12 RCW and RCW 43.22.270, 88-22-046 (Order 88-22), § 296-127-045, filed 10/31/88. Statutory Authority: RCW 39.12.015, 39.12.060 and House Bill 795, 1982 1st ex.s. c 38, 82-18-041 (Order 82-28), § 296-127-045, filed 8/27/82.]

**Chapter 296-130 WAC
FAMILY CARE**

WAC

296-130-010	Declaration of purpose.
296-130-020	Definitions.
296-130-030	Employee rights.
296-130-035	Employee complaints.
296-130-040	Prohibited action.
296-130-050	Posting.
296-130-060	Notices of infraction.
296-130-065	Service on employers.
296-130-070	Appeal of infraction notice.
296-130-080	Penalty assessment.
296-130-500	Collective bargaining not impaired.

WAC 296-130-010 Declaration of purpose. It is in the public interest for employers to accommodate employees by providing reasonable leaves from work for family reasons. This chapter serves to establish a minimum standard allowing an employee to use the employee's accrued sick leave to care for a child of the employee.

[Statutory Authority: RCW 43.22.270 and 1988 c 236, 88-18-044 (Order 88-20), § 296-130-010, filed 8/31/88.]

WAC 296-130-020 Definitions. (1) "Employer" means any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry, profession, or activity in this state and employs one or more employees. Employer also includes the state, any state institution, any state agency, political subdivisions of the state, and any municipal corporation or quasi-municipal corporation.

(2) "Employee" means a worker who is employed in the business of an employer. "Employee," for the purposes of this chapter, also includes workers performing in an executive, administrative, professional, or outside sales capacity.

(3) "Employ" means to engage, suffer, or permit to work.

(4) "Accrued sick leave" means leave which the employee has accumulated by earning a certain number of hours or days per month or per year which the employee is entitled to use to continue his or her normal compensation during absences due to illness, accident, or other conditions which require medical treatment or supervision, and which is provided for by a collective bargaining agreement, employer/employee agreement, employer policy, ordinance, or civil service rule.

It does not include annual leave, vacation leave, or personal leave. It does not include any benefit which includes leave granted by short-term or long-term disability plans except in a case where those plans include a separate and identifiable component which allows the employee to accumulate by earning a certain number of hours or days per month or per year which the employee is entitled to use to continue his or her normal compensation in absence due to illness, accident, or other conditions which require medical treatment or supervision which is provided for by a collective bargaining agreement, employer/employee agreement, employee/employer policy, ordinance, or civil service rule. In a case where a short-term or long-term disability plan includes a separate and identifiable component which allows the employee to accumulate leave by earning a certain number of hours or days per month or per year which the employee is entitled to use to continue his or her normal compensation in absence due to illness, accident, or other conditions which require medical treatment or supervision, only that separate identifiable portion shall be considered accrued sick leave.

(5) "Child of the employee" means any child under the age of eighteen who is:

- (a) The natural offspring of the employee;
- (b) The adopted child of the employee;
- (c) The natural or adopted child of the employee's spouse; or
- (d) Is under the employee's legal guardianship, legal custody, or foster care.

(6) "Health condition that requires treatment or supervision" shall include:

- (a) Any medical condition requiring medication that the child cannot self medicate;

(b) Any medical or mental health condition which would endanger the child's safety or recovery without the presence of a parent or guardian; or

(c) Any condition warranting preventive health care such as physical, dental, optical or immunization services, when a parent must be present to authorize and when sick leave may otherwise be used for the employee's preventive health care.

(7) "Infraction" means an alleged violation of RCW 49.12.____ (chapter 236, Laws of 1988) as cited by the department.

(8) "Administrative law judge" means any person appointed by the chief administrative law judge, as defined in RCW 34.12.020(2) to preside at contested cases convened under RCW 49.12.____ (chapter 236, Laws of 1988).

(9) "Department" means the department of labor and industries.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-020, filed 8/31/88.]

WAC 296-130-030 Employee rights. An employer shall allow an employee to use the employee's accrued sick leave, when such benefit exists, to care for the child of the employee under the age of eighteen with a health condition that requires treatment or supervision as defined in WAC 296-130-020(6). In all other instances the same benefits and requirements that would govern the employee's personal use of accrued sick leave shall apply to the use of sick leave for the child's treatment or supervision. Nothing in this section requires an employer to provide sick leave.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-030, filed 8/31/88.]

WAC 296-130-035 Employee complaints. (1) An employee who believes that his or her employer has not complied with RCW 49.12.____ (chapter 236, Laws of 1988), or with the rules promulgated thereto, may file a complaint with the department within six months of the alleged violation. The complaint should contain the following:

(a) The name and address of the employee making the complaint;

(b) The name, address, and telephone number of the employer against whom the complaint is made;

(c) A statement of the specific fact which constitute the alleged violation, including the date(s) on which the alleged violation occurred.

(2) Upon receipt of a complaint, the department shall forward written notice of the complaint to the employer, along with a warning of prohibited actions as stated in WAC 296-130-040.

(3) The department may investigate any complaint it deems appropriate. If the department determines that a violation of this chapter has occurred, it may issue a notice of infraction pursuant to WAC 296-130-060.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-23-117 (Order 88-29), § 296-130-035, filed 11/23/88.]

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WAC 296-130-040 Prohibited action. No employer shall discharge or in any other way discriminate against or penalize any employee because he/she sought any information about family leave provisions, has filed a complaint alleging a violation of the chapter or exercised any right granted under the law. Nothing in this section however, shall prohibit an employer from applying its attendance policies.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-040, filed 8/31/88.]

WAC 296-130-050 Posting. (1) The department shall furnish each employer a poster describing an employee's rights and an employer's obligations provided in this chapter.

(2) The employer shall keep posted a current edition department poster stipulating the provisions of this chapter. The employer shall display this poster in a conspicuous place.

(3) The employer shall post its leave policies, if any, in a conspicuous place accessible to the employees at the employer's place of business.

(4) The posting requirement for employees whose leave policies are specified by individual contracts may be satisfied by stating that leave for such employees will be governed by the terms of such contracts.

(5) Employers with informal leave policies which are established on a case-by-case basis may satisfy the posting requirement by posting a statement explaining that policy.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-050, filed 8/31/88.]

WAC 296-130-060 Notices of infraction. The department may issue a notice of infraction to an employer who violates RCW 49.12.____ (chapter 236, Laws of 1988). The employment standards supervisor shall direct that notices of infraction contain the following when issued.

(1) A statement that the notice represents a determination that the infraction has been committed by the employer named in the notice and that the determination shall be final unless contested;

(2) A statement that the infraction is a noncriminal offense for which imprisonment shall not be imposed as a sanction;

(3) A statement of the specific violation which necessitated issuance of the infraction;

(4) A statement of the penalty involved if the infraction is established;

(5) A statement informing the employer of the right to a hearing conducted pursuant to chapter 34.04 RCW if requested within twenty days of issuance of the infraction;

(6) A statement that at any hearing to contest the notice of infraction the state has the burden of proving, by a preponderance of the evidence, that the infraction was committed, and that the employer may subpoena witnesses including the agent that issued the notice of infraction;

(7) If a notice of infraction is personally served upon a supervisory or managerial employee of a firm or corporation, the department shall within ten days of service send a copy of the notice by certified mail to the employer;

(8) Constructive service may be made by certified mail directed to the employer named in the notice of infraction.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-060, filed 8/31/88.]

WAC 296-130-065 Service on employers. (1) If an employer is a corporation or a partnership, the department need not serve the employer personally. In such a case, if no officer or partner of a violating employer is present, the department may issue a notice of infraction to any supervisor or managerial employee.

(2) If the department serves a notice of infraction on a supervisory or managerial employee, and not on an officer, or partner of the employer, the department shall mail by certified mail a copy of the notice of infraction to the employer. The department shall mail a second copy by ordinary mail.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-065, filed 8/31/88.]

WAC 296-130-070 Appeal of infraction notice. (1) If an employer desires to contest the notice of infraction issued, the employer shall file two copies of a notice of appeal with the department at the office designated on the notice of infraction, within twenty days of issuance of the infraction.

(2) The department shall conduct a hearing in accordance with chapter 34.04 RCW and chapter 10-08 WAC.

(3) Employers may appear before the administrative law judge through counsel, or may represent themselves. The department shall be represented by the attorney general.

(4) All relevant evidence shall be admissible in a hearing convened pursuant to RCW 49.12.____ (chapter 236, Laws of 1988). Admission of evidence is subject to RCW 34.04.100 and 34.04.105 of the Administrative Procedure Act of Washington.

(5) The administrative law judge shall issue a proposed decision that includes findings of fact, conclusions of law, and if appropriate, any legal penalty. The proposed decision shall be served by certified mail or personally on the employer and the department. The employer or department may appeal to the director within thirty days after the date of issuance of the proposed decision. If none of the parties appeals within thirty days, the proposed decision may not be appealed either to the director or the courts.

(6) An appellant must file with the director an original and four copies of its notice of appeal. The notice of appeal must specify which findings and conclusions are erroneous. The appellant must attach to the notice the written arguments supporting its appeal.

The appellant must serve a copy of the notice of appeal and the arguments on the other parties. The respondent parties must file with the director their written arguments within thirty days after the date the notice of appeal and the arguments were served upon them.

(7) The director shall review the proposed decision in accordance with the Administrative Procedure Act, chapter 34.04 RCW. The director may: Allow the parties to present oral arguments as well as the written arguments; require the parties to specify the portions of the record on which the parties rely; require the parties to submit additional information by affidavit or certificate; remand the matter to the administrative law judge for further proceedings; and require a departmental employee to prepare a summary of the record for the director to review. The director shall issue a final decision that can affirm, modify, or reverse the proposed decision.

(8) The director shall serve the final decision on all parties. Any aggrieved party may appeal the final decision to superior court pursuant to RCW 34.04.130 unless the final decision affirms an unappealed proposed decision. If no party appeals within the period set by RCW 34.04.130, the director's decision is conclusive and binding on all parties.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-070, filed 8/31/88.]

WAC 296-130-080 Penalty assessment. An employer found to have committed an infraction under RCW 49.12.____ (chapter 236, Laws of 1988) may be assessed the maximum penalty of a fine of two hundred dollars for the first noncompliance violation. An employer that continues to violate the terms of the statute may be subject to a fine not to exceed one thousand dollars for each violation.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-080, filed 8/31/88.]

WAC 296-130-500 Collective bargaining not impaired. Nothing in this chapter shall be deemed to interfere with, impede, or in any way diminish the right of employees to bargain collectively with their employers through representatives of their own choosing in order to establish leave benefits in excess of the applicable minimum under the provisions of this chapter.

[Statutory Authority: RCW 43.22.270 and 1988 c 236. 88-18-044 (Order 88-20), § 296-130-500, filed 8/31/88.]

Chapter 296-150B WAC

STANDARDS FOR MOBILE HOMES, COMMERCIAL COACHES, AND RECREATIONAL VEHICLES

WAC

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- 296-150B-035 Engineering analysis and test procedures.
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- 296-150B-122 Location of insignia.

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296-150B-513	Light and ventilation.
296-150B-515	Heating, cooling, and ventilation requirements for portable classrooms.

WAC 296-150B-015 Definitions. For the purposes of this chapter:

(1) "Alteration" means the replacement, addition, modification, or removal of any equipment or installations that affect the construction, structural members, fire safety, or occupancy classification, or the plumbing, heating, or electrical systems, of a structure or component.

The following are not alterations unless they are made to repair damage caused by fires, floods, or damage in transit or during installation.

- (a) Repairs with approved parts;
- (b) Modification of a listed fuel-burning appliance in accordance with the terms of its listing;
- (c) Replacement of equipment with similar equipment; and

(d) Adjustment and maintenance of equipment.

(2) "Approved" means approved by the department.

(3) "Anchoring system" means a system of straps, cables, turnbuckles, bolts, fasteners, or other approved components that secures a mobile home to ground anchors or to other approved fastening devices.

(4) "Audit" means an inspection to examine for compliance a manufacturer's production and quality control procedures.

(5) "Building site" means a tract, parcel, or subdivision of land, including a mobile home park, on which a structure other than a recreational vehicle is or will be installed.

(6) "Component" means a discrete element that is:

- (a) Designed to be installed in a structure;
- (b) Manufactured as a unit; and
- (c) Designed for a particular function or group of functions. "Component" includes service cores.

(7) "Consumer" means a person, firm, corporation, agency, or governmental body, other than a manufacturer or dealer, that buys or leases a structure for his, her, or its own use.

(8) "Custom structure" means a one-of-a-kind structure.

(9) "Dealer" means a person, company, or corporation authorized to engage in the business of leasing, selling, offering for sale or lease, buying, or trading structures.

(10) "Department" means the department of labor and industries.

(11) "Design option" means a design that a manufacturer may use as an option to its design plan.

(12) "Design plan" means a plan for construction of a structure or component.

(13) "Equipment" means all materials, appliances, devices, fixtures, fittings, or accessories used in the

manufacture, assembly, installation, or alteration of structures and components.

(14) "Footing" means the portion of a foundation system that transmits loads from a mobile home to the soil.

(15) "Foundation facia" means the materials that enclose the entire perimeter of a mobile home and form a plane between the exterior wall of the mobile home and the ground.

(16) "Foundation system" means the footings, piers, caps, and shims that support a mobile home.

(17) "HUD" means the federal Department of Housing and Urban Development.

(18) "Independent inspection agency" means an organization that is in the business of inspecting structures, components, or equipment.

(19) "Insignia" means a label, stamp, or tag issued by the department to indicate that the structure or component bearing the insignia complies with this chapter or the HUD mobile home standards.

(20) "Install" means to erect, construct, assemble, or set in place a structure, component, or piece of equipment at a building site or in another structure or building.

(21) "Labeled" means bearing the department's insignia, HUD's insignia, or a label of approval from a testing or listing agency.

(22) "Lease" means an oral or written contract for the use, possession, or occupancy of property. It includes rent.

(23) "Listed" means that a piece of equipment, a component, or an installation appears in a list published by an approved testing or listing agency.

(24) "Listing agency" means an organization that is in the business of approving equipment or installations.

(25) "Local enforcement agency" means a city or county agency that enforces laws or ordinances governing the construction and installation of structures and components.

(26) "Main frame" means the structural component on which the structure may be mounted.

(27) "Manufacturing" means making, fabricating, forming, or assembling a structure, service core, component, equipment, or installation.

(28) "Mobile home" means a structure, transportable in one or more sections, that, in the traveling mode, is eight body feet or more in width or thirty-two body feet or more in length, or, when erected on site, is three hundred twenty or more square feet, and that is built on a permanent chassis and designed to be used as a dwelling with or without a permanent foundation when connected to the required utilities, and includes the plumbing, heating, air-conditioning, and electrical systems contained therein. "Mobile home" shall include any structure that meets all the requirements of this paragraph except the size requirements and with respect to which the manufacturer voluntarily files a certification required by HUD and complies with the standards established by HUD.

(29) "Ordinance" means the part of a code adopted by this chapter that prescribes an item other than a

method of construction, such as room sizes, floor plans, lighting, ventilation, ceiling heights, and exits.

(30) "Pier" means the part of the mobile home foundation system between the footing and the floor frame or floor joist, excluding caps and shims.

(31) "Quality control" means the plan and method for ensuring that the manufacture, fabrication, assembly, or erection of structures, components, and installations, and the storing, handling, and use of materials, complies with this chapter.

(32) "Recreational vehicle" means a vehicular type unit primarily designed for recreational camping, travel, or seasonal use which has its own motive power or is mounted on or towed by another vehicle. The basic entities are: Travel trailer, folding camping trailer, park trailer, truck camper, motor home, and multi-use vehicles.

(33) "Structure" means a mobile home, commercial coach, or recreational vehicle that is entirely or substantially prefabricated or assembled at a factory or a place other than the building site on which the structure will be installed.

(34) "System" means a part of a structure or component that is designed to serve a particular function, such as a structural, plumbing, electrical, heating, or mechanical system.

(35) "Testing agency" means an organization that is in the business of testing equipment, installations, or systems.

(36) "Commercial coach" means a structure transportable in one or more sections that is built on permanent chassis and designed to be used for commercial purposes with or without a permanent foundation when connected to the required outlets and may include plumbing, heating, air conditioning, and electrical systems contained therein. A commercial coach shall not be used as a single family dwelling.

(37) "Park trailer" means a vehicular unit which meets the following criteria:

(a) Built on a single chassis, mounted on wheels.

(b) Designed to provide seasonal or temporary living quarters which may be connected to utilities necessary for operation of installed fixtures and appliances.

(c) A gross trailer area not exceeding four hundred square feet when calculations used to determine the number of square feet in a structure will be based on the structure's exterior dimensions measured at the largest horizontal projections when erected on site. These dimensions will include all expandable rooms, cabinets, and other projections containing interior space, but do not include bay windows when the sill is located twelve inches or more above the finished floor.

(d) Of such a construction as to permit set-up by persons without special skills using only hand tools which may include lifting, pulling, and supporting devices.

(e) Exceeds the size restrictions specified in ANSI 119.2.

(38) "Uniform standards" as used in RCW 43.22.440 means those set-up instructions provided by the manufacturer, or specified in this chapter under WAC 296-

150B-225 through 296-150B-255. No other requirements may be imposed.

Exception: When extenuating conditions exist, not addressed in this chapter or the set-up instructions provided by the manufacturer, the local building official having jurisdiction shall be consulted.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 88-19-010 (Order 88-19), § 296-150B-015, filed 9/9/88; 86-21-136 (Order 86-32), § 296-150B-015, filed 10/22/86. Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-015, filed 4/16/82.]

WAC 296-150B-035 Engineering analysis and test procedures. (1) A manufacturer must show that a structural design, method of construction, installation, or piece of equipment is adequate to fulfill its intended function, further the manufacturer must submit to the department information on and the results of an engineering analysis or a physical test.

(2) When the manufacturer does an engineering analysis of the design, method, installation, or equipment, the analysis must be made in accordance with generally established principles of engineering and must be signed by an architect or professional engineer licensed in Washington.

(3) When the manufacturer tests the design, method, installation, or equipment, the tests must be performed by a testing agency or must be directed, witnessed, and evaluated by an approved architect or professional engineer licensed in Washington.

Test reports must contain the following items:

(a) A description of the method or standards that applied to the test;

(b) A description and drawings of the item tested;

(c) A description of the test set-up;

(d) A description of the procedure used to load the item for, and to measure, each condition;

(e) Test data (and graphs, where applicable), including pertinent observations of the characteristics and behavior of the item tested;

(f) Engineering data; and

(g) Analysis, comments, and conclusion.

(4) The results of the tests or analyses must be in writing and must identify the design plan to which the results relate.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 87-21-040 (Order 87-20), § 296-150B-035, filed 10/14/87. Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-035, filed 4/16/82.]

WAC 296-150B-050 Application for approval of a quality control manual. As a minimum the quality control manual/quality control program will provide for the following:

(1) Designation of officer/manager responsible for establishment and implementation of the quality control program.

(2) Design plan submission and approval.

(3) Drawing and change control that provides for the generation and distribution of working drawings, manufacturing processes and procedures, inspection and test procedures consistent with the design approvals and specification requirements.

(4) Receiving inspection of procured material in accordance with established acceptance criteria.

(5) Definition of production stations, the work performed in each station, type and amount of inspection and test performed, minimum acceptance criteria and person responsible.

(6) Description of documentation used to define the as-built configuration of each unit produced.

(7) Identification, control and disposition of nonconforming material.

(8) Corrective action system that will provide positive correction or repetitive discrepancies, failures, or nonconformance.

(9) Controls for material storage to include age-dated material.

(10) Calibration of all special tooling, gauges, and test equipment.

(11) Controls for issuance of Washington state insignias.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 87-21-040 (Order 87-20), § 296-150B-050, filed 10/14/87. Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-050, filed 4/16/82.]

WAC 296-150B-060 Expiration of design plan approval. (1) Approval of a design plan and quality control manual expires twelve months after the date the department approves the plan.

(2) A manufacturer must apply to the department for renewal of the design plan and quality control manual approval at least two months before the approval expires to ensure that the department will have time to examine and approve the application. The manufacturer may obtain an application for renewal of plan and quality control manual approval from the department. The manufacturer must submit:

(a) A completed application form; and

(b) The renewal fee required by WAC 296-150B-990. The renewed plan and quality control manual must be identical to the original design plan, except that the manufacturer may change the model name or designation.

(3) If a manufacturer allows a design plan and quality control manual approval to expire, it must return all unused insignias issued to the manufacturer for the product covered by the expired design plan.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 87-21-040 (Order 87-20), § 296-150B-060, filed 10/14/87. Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-060, filed 4/16/82.]

WAC 296-150B-122 Location of insignia. Each insignia affixed to a recreational vehicle or commercial coach shall be located adjacent to the main entry door not less than twelve inches above the floor line.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 87-21-040 (Order 87-20), § 296-150B-122, filed 10/14/87.]

WAC 296-150B-125 Identification of commercial coaches and recreational vehicles. (1) Each commercial coach or recreational vehicle manufactured, sold, leased, or offered for sale or lease in Washington shall bear a

permanently affixed identification label that contains the following information:

(a) The name of the manufacturer;

(b) The month and year of manufacture;

(c) The vehicle identification number;

(d) The manufacturer's assigned identification number; and

(e) Where applicable, the assigned plan approval number.

(2) The identification label shall be permanently attached either on the forward half of the left side of the exterior wall of the commercial coach or recreational vehicle, not less than six inches above the floor line, or in proximity to the insignia.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 87-21-040 (Order 87-20), § 296-150B-125, filed 10/14/87. Statutory Authority: RCW 43.22.340. 82-09-053 (Order 82-13), § 296-150B-125, filed 4/16/82.]

WAC 296-150B-185 Reciprocal agreement for recreational vehicles. Monitoring of reciprocal states, third party agencies, or manufacturers attaining self inspection status. The department shall, on a periodic basis, monitor the quality of the inspections performed by states, third party agencies, or manufacturers having self inspection status at the manufacturing facility to assure compliance with the requirements of the approved design plans, quality control manual, and respective specifications. Noncompliances determined during monitoring will be processed in accordance with WAC 296-150B-135.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 87-21-040 (Order 87-20), § 296-150B-185, filed 10/14/87. Statutory Authority: RCW 43.22.340 and 43.22.400. 83-12-014 (Order 83-13), § 296-150B-185, filed 5/24/83.]

WAC 296-150B-200 General installation requirements for mobile homes. (1) All mobile homes shall be installed in compliance with the national manufactured housing procedural and enforcement regulations in subparts F and I of 24 C.F.R. Part 3282 adopted as of April 1, 1982, which are incorporated into these rules by this reference.

(2) A HUD-labeled mobile home shall also be installed in compliance with the mobile home manufacturer's installation instructions. The instructions must be approved by HUD. The manufacturer shall send two copies of its approved installation instructions to the purchaser of the mobile home. The copies shall be in the home and available at the time of inspection.

A mobile home not labeled by HUD shall also be installed in accordance with installation instructions provided by a professional engineer or architect licensed in Washington.

(3) To the extent that the installation of a mobile home is not covered by a manufacturer's, engineer's, or architect's instructions, the mobile home shall comply with the installation requirements set out in WAC 296-150B-225 through 296-150B-255.

(4) No person, firm, partnership, corporation, or other entity may install a mobile home unless he, she, or it

owns the mobile home, is a licensed mobile home dealer, or is a contractor registered under chapter 18.27 RCW.

(5) In those areas that are (a) recognized as flood plains by the Washington state department of ecology or the Federal Emergency Management Agency, or (b) hazardous because of the probability of earthquakes, ground slides, avalanches, or high winds, the local jurisdictions may set requirements that are necessary to lessen the hazards.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 87-21-040 (Order 87-20), § 296-150B-200, filed 10/14/87. Statutory Authority: RCW 43.22.350 and 43.22.440. 83-01-018 (Order 82-37), § 296-150B-200, filed 12/6/82. Statutory Authority: RCW 43.22.440. 82-09-059 (Order 82-12), § 296-150B-200, filed 4/19/82.]

WAC 296-150B-220 Inspection by local jurisdictions. (1) RCW 43.22.440. The legislature finds that inspections of mobile home installation are not done on a consistent basis. Mobile homes provide housing for many people in the state, and improperly installed mobile homes are a serious health and safety risk. Where possible and practical, mobile homes should be treated the same as any housing inhabited or to be inhabited by persons in this state, including housing built according to the state building code.

(2) In consultation with the factory assembled structures advisory board for mobile homes, the director of labor and industries shall by rule establish uniform standards for the performance and workmanship of installation service and warranty service by persons or entities engaged in performing the services within this state for all mobile homes, as defined in RCW 46.04.302. The standards shall conform, where applicable, with statutes, rules, and recommendations established under the Federal National Mobile Home Construction and Safety Standards Act of 1974 (42 U.S.C. Sec. 5401 et seq.). These rules regarding the installation of mobile homes shall be enforced and fees charged by the counties and cities in the same manner the state building code is enforced under RCW 19.27.050.

If a dispute concerning an installation requirement of this chapter arises between any person or business and a local jurisdiction or other agent of the department, the dispute may be submitted to the factory assembled structures advisory board for its opinion as to the proper interpretation of the requirement.

(3) In addition to and in conjunction with the remedies provided in this chapter, failure to remedy any breach of the standards and rules so established, upon adequate notice and within a reasonable time, is a violation of the Consumer Protection Act, chapter 19.86 RCW and subject to the remedies provided in that chapter.

(4) A manufacturer's set-up manual shall be provided for the inspecting jurisdiction. The set-up manual shall be located between the I beam and the bottom board within five feet of the main electrical feeder when the skirting has not been installed. When the skirting has been installed, the set-up manual shall be located between the I beam and the bottom board within five feet of the access opening. Instructions shall be returned to such location when inspection is completed.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 88-19-010 (Order 88-19), § 296-150B-220, filed 9/9/88. Statutory Authority: RCW 43.22.350 and 43.22.440. 83-01-018 (Order 82-37), § 296-150B-220, filed 12/6/82. Statutory Authority: RCW 43.22.440. 82-09-059 (Order 82-12), § 296-150B-220, filed 4/19/82.]

WAC 296-150B-225 Building site preparation. (1) A mobile home may not be installed at a building site unless the ground at the site has adequate compaction and load-bearing ability to meet the support requirements of Chapter 29 and Table 29B of the Uniform Building Code as adopted by the state building code council or WAC 296-150B-230. The installer or, if the building site is in a mobile home park, the park owner must ensure that the ground on which a mobile home is to be installed has been improved as necessary to provide a proper base for the mobile home and that the area beneath the mobile home has adequate drainage.

(2) Ground cover. A ground cover of 4 mil (0.004 inch thick) polyethylene or approved equal shall be laid over the ground within crawl spaces. The ground cover shall be overlapped twelve inches minimum at joints and shall extend over the top of the footing.

Exception: The ground cover may be omitted in unheated crawl spaces, if the crawl space has a concrete slab floor with a minimum thickness of three and one-half inches.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 88-19-010 (Order 88-19), § 296-150B-225, filed 9/9/88. Statutory Authority: RCW 43.22.350 and 43.22.440. 83-01-018 (Order 82-37), § 296-150B-225, filed 12/6/82. Statutory Authority: RCW 43.22.440. 82-09-059 (Order 82-12), § 296-150B-225, filed 4/19/82.]

WAC 296-150B-245 Foundation facia. (1) A mobile home shall have an approved foundation facia around its entire perimeter. The wood of the facia shall be at least three inches from the ground unless it is pressure-treated wood. Metal fasteners shall be galvanized, stainless steel, or other corrosion-resistant material. Ferrous metal members in contact with the earth, other than those that are galvanized or stainless steel, shall be coated with an asphaltic emulsion.

(2) The skirting of a manufactured home shall be ventilated by an approved mechanical means, or by openings in exterior facia or foundation walls. Such openings shall have a net area of not less than one square foot for each one hundred fifty square feet of under floor area. Openings shall be located as close to corners as practical and shall provide cross ventilation. The required area of such openings shall be approximately equally distributed along the length of at least two opposite sides. They shall be covered with corrosion-resistant wire mesh with openings of one-quarter inch in dimension.

(3) Dryer vents and hot water tank pressure relief valves shall exhaust on the exterior of the foundation facia. The facia for each section of a mobile home shall have an opening of at least eighteen inches by twenty-four inches, with a cover of metal or pressure treated wood, to allow access to the crawl space. The foundation facia must be installed within thirty days after the mobile home is occupied.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 88-19-010 (Order 88-19), § 296-150B-245, filed 9/9/88. Statutory Authority: RCW 43.22.350 and 43.22.440. 83-01-018 (Order 82-37), § 296-150B-245, filed 12/6/82. Statutory Authority: RCW 43.22.440. 82-09-059 (Order 82-12), § 296-150B-245, filed 4/19/82.]

WAC 296-150B-513 Light and ventilation. Habitable rooms shall be provided with exterior windows or doors having a total glazed area of not less than 10 percent of the floor area, or shall be provided with artificial light. An area equivalent to not less than 5 percent of the floor area shall be available for unobstructed ventilation. Glazed areas need not be openable where a mechanical ventilation system is provided and is capable of producing a change of air in the room(s) every thirty minutes with not less than one-fifth of the air supply taken from outside the commercial coach.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 87-21-040 (Order 87-20), § 296-150B-513, filed 10/14/87. Statutory Authority: RCW 43.22.340. 82-04-060 (Order 82-4), § 296-150B-513, filed 2/2/82.]

WAC 296-150B-515 Heating, cooling, and ventilation requirements for portable classrooms. Portable classrooms shall comply with the following space comfort control requirements.

(1) Mechanical ventilation.

(a) Portable classrooms shall be provided with a tempered air mechanical ventilation system, automatically controlled.

(b) The air supply volume shall be no less than 1.3 cubic feet per minute (c.f.m.) per square foot of floor area in portable classrooms.

(c) The system shall be provided with an economizer cycle to automatically mix recirculated air and outside air, to provide atmospheric cooling. The air supply system shall be arranged to modulate the amount of outdoor air from minimum setting to one hundred percent outside air during the nonheating period.

(d) The minimum amount of outside air introduced after the room is up to setpoint temperature during occupancy shall not be less than 10 c.f.m. per occupant.

(2) Heating. The system shall provide a temperature differential in the occupied zone not to exceed plus or minus 2°F. Air supply systems shall be provided with a means to discharge air which shall not generate a noise level over 35 N.C. The terminal air velocities in occupied zone shall not exceed 50 feet per minute (f.p.m.).

(3) Temperature control. A system of automatic temperature controls shall be provided which will automatically maintain space setpoint temperature, 72°F heating, 78°F cooling, if cooling is provided, including night setback operation with intermittent fan operation, zero percent outside air and night setback temperature (55°F). Controls shall include seven day scheduling.

(4) Cooling. Mechanical refrigeration is optional. Cooling systems shall be of sufficient capacity to maintain cooling setpoint previously mentioned, under A.S.H.R.A.E. design conditions for the location in which the portable classroom is installed based on 2.5 percentile—dry and wet bulb temperatures. Ventilation rate

shall be 10 c.f.m. (cu.ft./min.) per occupant under mechanical cooling cycle operation.

(5) Professional design requirements. Portable classroom design drawings shall incorporate a heating, ventilating (and air conditioning where applicable) design prepared by a professional engineer, registered in Washington state, and experienced in the heating, ventilating and air conditioning field. The engineer's seal shall be affixed to said drawings.

[Statutory Authority: RCW 43.22.340 through 43.22.445. 87-21-040 (Order 87-20), § 296-150B-515, filed 10/14/87.]

Chapter 296-155 WAC

SAFETY STANDARDS FOR CONSTRUCTION WORK

Reviser's note: To simplify the organization of this lengthy chapter and to assist the user in locating the desired subject matter, the agency has divided this chapter into subchapters. Only the names of such subchapters are shown in this chapter digest; for a full listing of sections within subchapters refer to the appropriate subchapter digest preceding the text of such sections.

Subchapters

- Part B-1 Occupational health and environmental control. (WAC 296-155-100 through 296-155-170)
- Part B-2 Asbestos, tremolite, anthophyllite, and actinolite. (WAC 296-155-175 through 296-155-193 Repealed)
- Part D Fire protection and prevention. (WAC 296-155-250 through 296-155-280)
- Part H Welding and cutting. (WAC 296-155-400 through 296-155-420)
- Part I Electrical. (WAC 296-155-425 through 296-155-462)
- Part Q Tunnels and shafts, caissons, cofferdams, and compressed air. (WAC 296-155-725 through 296-155-74501)
- Part S Demolition. (WAC 296-155-775 through 296-155-830)

Part B-1

OCCUPATIONAL HEALTH AND ENVIRONMENTAL CONTROL

WAC

296-155-160 Gases, vapors, fumes, dusts, and mists.

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

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

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

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

(5) Subsections (1) and (2) of this section do not apply to the exposure of employees to formaldehyde. Whenever any employee is exposed to formaldehyde, the requirements of WAC 296-62-07530 shall apply.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-155-160, filed 7/6/88; 87-24-051 (Order 87-24), § 296-155-160, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-160, filed 4/27/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-160, filed 1/21/86. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-155-160, filed 11/30/83; Order 74-26, § 296-155-160, filed 5/7/74, effective 6/6/74.]

Part B-2

ASBESTOS, TREMOLITE, ANTHOPHYLLITE, AND ACTINOLITE

WAC

- 296-155-175 Repealed.
- 296-155-17505 Repealed.
- 296-155-17510 Repealed.
- 296-155-17515 Repealed.
- 296-155-17520 Repealed.
- 296-155-17525 Repealed.
- 296-155-17530 Repealed.
- 296-155-17532 Repealed.
- 296-155-17535 Repealed.
- 296-155-17540 Repealed.
- 296-155-17545 Repealed.
- 296-155-17550 Repealed.
- 296-155-17555 Repealed.
- 296-155-17560 Repealed.
- 296-155-17565 Repealed.
- 296-155-17570 Repealed.
- 296-155-17575 Repealed.
- 296-155-177 Repealed.
- 296-155-179 Repealed.
- 296-155-181 Repealed.
- 296-155-183 Repealed.
- 296-155-185 Repealed.
- 296-155-187 Repealed.
- 296-155-189 Repealed.
- 296-155-191 Repealed.
- 296-155-193 Repealed.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS SUBCHAPTER

- 296-155-175 Scope and application. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-175, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17505 Definitions. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17505, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17510 Permissible exposure limits (PEL). [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17510, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24),

- filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17515 Communication among employers. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17515, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17520 Identification. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17520, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17525 Regulated areas. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17525, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17530 Exposure monitoring. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17530, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17532 Methods of compliance. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17532, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17535 Respiratory protection. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17535, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17540 Protective clothing. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17540, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17545 Hygiene facilities and practices. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17545, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17550 Communication of hazards to employees. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17550, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17555 Housekeeping. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17555, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17560 Medical surveillance. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17560, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17565 Recordkeeping. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17565, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17570 Dates. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17570, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-17575 Appendices. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-17575, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-177 Appendix A—WISHA reference method—Mandatory. [Statutory Authority: RCW 49.17.050(2) and

- 49.17.040. 87-10-008 (Order 87-06), § 296-155-177, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-179 Appendix B—Detailed procedure for asbestos, tremolite, anthophyllite, and actinolite sampling and analysis—Nonmandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-179, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-181 Appendix C—Qualitative and quantitative fit testing procedures—Mandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-181, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-183 Appendix D—Medical questionnaires—Mandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-183, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-185 Appendix E—Interpretation and classification of chest roentgenograms—Mandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-185, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-187 Appendix F—Work practices and engineering controls for major asbestos removal, renovation, and demolition operations—Nonmandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-187, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-189 Appendix G—Work practices and engineering controls for small-scale, short-duration asbestos renovation and maintenance operations—Nonmandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-189, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-191 Appendix H—Substance technical information for asbestos—Nonmandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-191, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- 296-155-193 Appendix I—Medical surveillance guidelines for asbestos, tremolite, anthophyllite, and actinolite—Nonmandatory. [Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-193, filed 4/27/87.] Repealed by 87-24-051 (Order 87-24), filed 11/30/87. Statutory Authority: Chapter 49.17 RCW.
- WAC 296-155-175 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-17505 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-17510 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-17515 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-17520 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-17525 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-17530 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-17532 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-17535 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-17540 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-17545 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-17550 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-17555 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-17560 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-17565 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-17570 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-17575 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-177 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-179 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-181 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-183 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-185 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-187 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-189 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-191 Repealed.** See Disposition Table at beginning of this chapter.
- WAC 296-155-193 Repealed.** See Disposition Table at beginning of this chapter.

Part D

FIRE PROTECTION AND PREVENTION

WAC

296-155-265

Fire prevention.

296-155-270

Flammable and combustible liquids.

WAC 296-155-265 Fire prevention. (1) Ignition hazards.

(a) Electrical wiring and equipment for light, heat, or power purposes shall be installed in compliance with the requirements of Part I of this standard.

(b) Internal combustion engine powered equipment shall be so located that exhausts are well away from combustible materials. When exhausts are piped to outside the building under construction, a clearance of at least 6 inches shall be maintained between such piping and combustible material.

(c) Smoking shall be prohibited at or in the vicinity of operations which constitute a fire hazard, and shall be conspicuously posted: "No smoking or open flame."

(d) Portable battery powered lighting equipment, used in connection with the storage, handling, or use of flammable gases or liquids, shall be of the type approved for the hazardous locations.

(e) The nozzle of air, inert gas, and steam lines or hoses, when used in the cleaning or ventilation of tanks and vessels that contain hazardous concentrations of flammable gases or vapors, shall be bonded to the tank or vessel shell. Bonding devices shall not be attached or detached in hazardous concentrations of flammable gases or vapors.

(f) Workers shall not take open lights or open flames near or in an open sewer manhole, gas main, conduit or other similar place until the absence of explosive or harmful gases has been assured. Open lights or flames shall not be carried into areas and enclosures where flammable vapors or exposed low flash point solvents exist. Only approved and suitable protected lights shall be used.

(2) Temporary buildings.

(a) No temporary building shall be erected where it will adversely affect any means of exit.

(b) Temporary buildings, when located within another building or structure, shall be of either noncombustible construction or of combustible construction having a fire resistance of not less than 1 hour.

(c) Temporary buildings, located other than inside another building and not used for the storage, handling, or use of flammable or combustible liquids, flammable gases, explosives, or blasting agents, or similar hazardous occupancies, shall be located at a distance of not less than 10 feet from another building or structure. Groups of temporary buildings, not exceeding 2,000 square feet in aggregate, shall, for the purpose of this part, be considered a single temporary building.

(3) Open yard storage.

(a) Combustible materials shall be piled with due regard to the stability of piles and in no case higher than 20 feet.

(b) Driveways between and around combustible storage piles shall be at least 15 feet wide and maintained

free from accumulation of rubbish, equipment, or other articles or materials. Driveways shall be so spaced that a maximum grid system unit of 50 feet by 150 feet is produced.

(c) The entire storage site shall be kept free from accumulation of unnecessary combustible materials. Weeds and grass shall be kept down and a regular procedure provided for the periodic cleanup of the entire area.

(d) When there is a danger of an underground fire, that land shall not be used for combustible or flammable storage.

(e) Method of piling shall be solid wherever possible and in orderly and regular piles. No combustible material shall be stored outdoors within 10 feet of a building or structure.

(f) Portable fire extinguishing equipment, suitable for the fire hazard involved, shall be provided at convenient, conspicuously accessible locations in the yard area. Portable fire extinguishers, rated not less than 2A, shall be placed so that maximum travel distance to the nearest unit shall not exceed 100 feet.

(4) Indoor storage.

(a) Storage shall not obstruct, or adversely affect, means of exit.

(b) All materials shall be stored, handled, and piled with due regard to their fire characteristics.

(c) Noncompatible materials, which may create a fire hazard, shall be segregated by a barrier having a fire resistance of at least 1 hour.

(d) Material shall be piled to minimize the spread of fire internally and to permit convenient access for fire-fighting. Stable piling shall be maintained at all times. Aisle space shall be maintained to safely accommodate the widest vehicle that may be used within the building for fire-fighting purposes.

(e) Clearance of at least 36 inches shall be maintained between the top level of the stored material and the sprinkler deflectors.

(f) Clearance shall be maintained around lights and heating units to prevent ignition of combustible materials.

(g) A clearance of 24 inches shall be maintained around the path of travel of fire doors unless a barricade is provided, in which case no clearance is needed. Material shall not be stored within 36 inches of a fire door opening.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-155-265, filed 11/14/88; Order 74-26, § 296-155-265, filed 5/7/74, effective 6/6/74.]

WAC 296-155-270 Flammable and combustible liquids. (1) General requirements.

(a) Only approved containers and portable tanks shall be used for storage and handling of flammable and combustible liquids. Approved metal safety cans shall be used for the handling and use of flammable liquids in quantities greater than one gallon, except that this shall not apply to those flammable liquid materials which are highly viscid highly (extremely hard to pour), which may be used and handled in original shipping containers.

For quantities of one gallon or less, only the original container or approved metal safety cans shall be used for storage, use, and handling of flammable liquids.

(b) Flammable or combustible liquids shall not be stored in areas used for exits, stairways, or normally used for the safe passage of people.

(c) Flammable and combustible liquid containers shall be legibly marked to indicate their contents. Each storage container for flammable or combustible liquids, with a capacity of 50 gallons or more, shall have the contents of the container identified by a sign of clearly visible contrasting colors with letters at least 3 inches high, painted on the container at the discharge valve and at the fill point.

(d) Gasoline shall not be used as a solvent or a cleaning agent.

(2) Indoor storage of flammable and combustible liquids.

(a) No more than 25 gallons of flammable or combustible liquids shall be stored in a room outside of an approved storage cabinet. For storage of liquid petroleum gas, see WAC 296-155-275.

(b) Quantities of flammable and combustible liquid in excess of 25 gallons shall be stored in an acceptable or approved cabinet meeting the following requirements:

(i) Acceptable wooden storage cabinets shall be constructed in the following manner, or equivalent: The bottom, sides, and top shall be constructed of an exterior grade of plywood at least 1 inch in thickness, which shall not break down or delaminate under standard fire test conditions. All joints shall be rabbeted and shall be fastened in two directions with flathead wood screws, when more than one door is used, there shall be a rabbeted overlap of not less than 1 inch. Steel hinges shall be mounted in such a manner as to not lose their holding capacity due to loosening or burning out of the screws when subjected to fire. Such cabinets shall be painted inside and out with fire retardant paint.

(ii) Approved metal storage cabinets will be acceptable.

(iii) Cabinets shall be labeled in conspicuous lettering, "Flammable—Keep fire away."

(c) Not more than 60 gallons of flammable or 120 gallons of combustible liquids shall be stored in any one storage cabinet. Not more than three such cabinets may be located in a single storage area. Quantities in excess of this shall be stored in an inside storage room.

(d)(i) Inside storage room shall be constructed to meet the required fire-resistive rating for their use. Such construction shall comply with the test specifications set forth in Standard Methods of Fire Test of Building Construction and Material, NFPA 251-1972.

(ii) Where an automatic extinguishing system is provided, the system shall be designed and installed in an approved manner. Openings to other rooms or buildings shall be provided with noncombustible liquid-tight raised sills or ramps at least 4 inches in height, or the floor in the storage area shall be at least 4 inches below the surrounding floor. Openings shall be provided with approved self-closing fire doors. The room shall be liquid-tight where the walls join the floor. A permissible

alternate to the sill or ramp is an open-grated trench, inside of the room, which drains to a safe location. Where other portions of the building or other buildings are exposed, windows shall be protected as set forth in the Standard for Fire Doors and Windows, NFPA No. 80-1983, for Class E or F openings. Wood of at least 1-inch nominal thickness may be used for shelving, racks, dunnage, scuffboards, floor overlay and similar installations.

(iii) Materials which will react with water and create a fire hazard shall not be stored in the same room with flammable or combustible liquids.

(iv) Storage in inside storage rooms shall comply with Table D-2 following:

TABLE D-2

Fire protection provided	Fire resistance	Maximum size	Total allowable quantities gals./sq. ft./floor area
Yes	2 hrs.	500 sq. ft.	10
No	2 hrs.	500 sq. ft.	4
Yes	1 hr.	150 sq. ft.	5
No	1 hr.	150 sq. ft.	2

Note: Fire protection system shall be sprinkler, water spray, carbon dioxide or other system approved by a nationally recognized testing laboratory for this purpose.

(v) Electrical wiring and equipment located in inside storage rooms shall be approved for Class 1, Division 1, hazardous locations. For definition of Class 1, Division 1, hazardous locations, see WAC 296-155-456.

(vi) Every inside storage room shall be provided with either a gravity or a mechanical exhausting system. Such system shall commence not more than 12 inches above the floor and be designed to provide for a complete change of air within the room at least 6 times per hour. If a mechanical exhausting system is used, it shall be controlled by a switch located outside of the door. The ventilating equipment and any lighting fixtures shall be operated by the same switch. An electric pilot light shall be installed adjacent to the switch if flammable liquids are dispensed within the room. Where gravity ventilation is provided, the fresh air intake, as well as the exhausting outlet from the room, shall be on the exterior of the building in which the room is located.

(vii) In every inside storage room there shall be maintained one clear aisle at least 3 feet wide. Containers over 30 gallons capacity shall not be stacked one upon the other.

(viii) Flammable and combustible liquids in excess of that permitted in inside storage rooms shall be stored outside of buildings in accordance with subsection (3) of this section.

(3) Storage outside buildings.

(a) Storage of containers (not more than 60 gallons each) shall not exceed 1,100 gallons in any one pile or

area. Piles or groups of containers shall be separated by a 5-foot clearance. Piles or groups of containers shall not be nearer than 20 feet to a building.

(b) Within 200 feet of each pile of containers, there shall be a 12-foot-wide access way to permit approach of fire control apparatus.

(c) The storage area shall be graded in a manner to divert possible spills away from buildings or other exposures, or shall be surrounded by a curb or earth dike at least 12 inches high. When curbs or dikes are used, provisions shall be made for draining off accumulations of ground or rain water, or spills of flammable or combustible liquids. Drains shall terminate at a safe location and shall be accessible to operation under fire conditions.

(d) Outdoor portable tank storage.

(i) Portable tanks shall not be nearer than 20 feet from any building. Two or more portable tanks, grouped together, having a combined capacity in excess of 2,200 gallons, shall be separated by a 5-foot-clear area. Individual portable tanks exceeding 1,100 gallons shall be separated by a 5-foot-clear area.

(ii) Within 200 feet of each portable tank, there shall be a 12-foot-wide access way to permit approach of fire control apparatus.

(e) Storage areas shall be kept free of weeds, debris, and other combustible material not necessary to the storage.

(f) Portable tanks, not exceeding 660 gallons, shall be provided with emergency venting and other devices, as required by chapters III and IV of NFPA 30-1972, The Flammable and Combustible Liquids Code.

(g) Portable tanks, in excess of 660 gallons, shall have emergency venting and other devices, as required by chapters II and III of the Flammable and Combustible Liquids Code, NFPA 30-1972.

(4) Fire control for flammable or combustible liquid storage.

(a) At least one portable fire extinguisher, having a rating of not less than 20-B units, shall be located outside of, but not more than 10 feet from, the door opening into any room used for storage of more than 60 gallons of flammable or combustible liquids.

(b) At least one portable fire extinguisher having a rating of not less than 20-B units shall be located not less than 25 feet, nor more than 75 feet, from any flammable liquid storage area located outside.

(c) When sprinklers are provided, they shall be installed in accordance with the Standard for the Installation of Sprinkler Systems, NFPA 13-1972.

(d) At least one portable fire extinguisher having a rating of not less than 20-B:C units shall be provided on all tank trucks or other vehicles used for transporting and/or dispensing flammable or combustible liquids.

(5) Dispensing liquids.

(a) Areas in which flammable or combustible liquids are transferred at the same time, in quantities greater than 5 gallons from one tank or container to another tank or container, shall be separated from other operations by 25-foot distance or by construction having a fire-resistance of at least 1 hour. Drainage or other

means shall be provided to control spills. Adequate natural or mechanical ventilation shall be provided to maintain the concentration of flammable vapor at or below 10 percent of the lower flammable limit.

(b) Transfer flammable liquids from one container to another shall be done only when containers are electrically interconnected (bonded).

(c) Flammable or combustible liquids shall be drawn from or transferred into vessels, containers, or tanks within a building or outside only through a closed piping system, from safety cans, by means of a device drawing through the top, or from a container, or portable tanks, by gravity or pump, through an approved self-closing valve. Transferring by means of air pressure on the container or portable tank is prohibited.

(d) The dispensing units shall be protected against collision damage.

(e) Dispensing devices and nozzles for flammable liquids shall be of an approved type, as required by WAC 296-24-33015.

(6) Handling liquids at point of final use.

(a) Flammable liquids shall be kept in closed containers when not actually in use.

(b) Leakage or spillage of flammable or combustible liquids shall be disposed of promptly and safely.

(c) Flammable liquids shall be used only where there are no open flames or other sources of ignition within 50 feet of the operation, unless conditions warrant greater clearance.

(7) Service and refueling areas.

(a) Flammable or combustible liquids shall be stored in approved closed containers, in tanks located underground, or in aboveground portable tanks.

(b) The tank trucks shall comply with the requirements covered in the Standard for Tank Vehicles for Flammable and Combustible Liquids, NFPA No. 385-1977.

(c) The dispensing hose shall be an approved type.

(d) The dispensing nozzle shall be an approved automatic-closing type.

(e) Underground tanks shall not be abandoned.

(f) Clearly identified and easily accessible switch(es) shall be provided at a location remote from dispensing devices to shut off the power to all dispensing devices in the event of an emergency.

(g)(i) Heating equipment of an approved type may be installed in the lubrication or service area where there is no dispensing or transferring of flammable liquids, provided the bottom of the heating unit is at least 18 inches above the floor and is protected from physical damage.

(ii) Heating equipment installed in lubrication or service areas, where flammable liquids are dispensed, shall be of an approved type for garages, and shall be installed at least 8 feet above the floor.

(h) There shall be no smoking or open flames in the areas used for fueling, servicing fuel systems for internal combustion engines, receiving or dispensing of flammable or combustible liquids.

(i) Conspicuous and legible signs prohibiting smoking shall be posted.

(j) The motor of any equipment being fueled shall be shut off during the fueling operation.

(k) Each service or fueling area shall be provided with at least one fire extinguisher having a rating of not less than 20BC located so that an extinguisher will be within 75 feet of each pump, dispenser, underground fill pipe opening, and lubrication or service area.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-155-270, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-270, filed 1/21/86; Order 74-26, § 296-155-270, filed 5/7/74, effective 6/6/74.]

Part H

WELDING AND CUTTING

WAC

296-155-405 Arc welding and cutting.

WAC 296-155-405 Arc welding and cutting. (1)
Manual electrode holders.

(a) Only manual electrode holders which are specifically designed for arc welding and cutting, and are of a capacity capable of safely handling the maximum rated current required by the electrodes, shall be used.

(b) Any current-carrying parts passing through the portion of the holder which the arc welder or cutter grips in his hand, and the outer surfaces of the jaws of the holder, shall be fully insulated against the maximum voltage encountered to ground.

(2) Welding cables and connectors.

(a) All arc welding and cutting cables shall be of the completely insulated, flexible type, capable of handling the maximum current requirements of the work in progress, taking into account the duty cycle under which the arc welder or cutter is working.

(b) Only cable free from repair or splices for a minimum distance of 10 feet from the cable end to which the electrode holder is connected shall be used, except that cables with standard insulated connectors or with splices whose insulating quality is equal to that of the cable are permitted.

(c) When it becomes necessary to connect or splice lengths of cable one to another, substantial insulated connectors of a capacity at least equivalent to that of the cable shall be used. If connections are effected by means of cable lugs, they shall be securely fastened together to give good electrical contact, and the exposed metal parts of the lugs shall be completely insulated.

(d) Cables in need of repair shall not be used. When a cable, other than the cable lead referred to in subdivision (b) of this subsection, becomes worn to the extent of exposing bare conductors, the portion thus exposed shall be protected by means of rubber and friction tape or other equivalent insulation.

(3) Ground returns and machine grounding.

(a) A ground return cable shall have a safe current carrying capacity equal to or exceeding the specified maximum output capacity of the arc welding or cutting unit which it services. When a single ground return cable services more than one unit, its safe current-carrying

capacity shall equal or exceed the total specified maximum output capacities of all the units which it services.

(b) Pipelines containing gases or flammable liquids, or conduits containing electrical circuits, shall not be used as a ground return. For welding on natural gas pipelines, the technical portions of regulations issued by the Department of Transportation, Office of Pipeline Safety, Minimum Federal Safety Standards for Gas Pipelines shall apply. (49 CFR Part 192, Subpart C.)

(c) When a structure or pipeline is employed as a ground return circuit, it shall be determined that the required electrical contact exist at all joints. The generation of an arc, sparks, or heat at any point shall cause rejection of the structures as a ground circuit.

(d) When a structure or pipeline is continuously employed as a ground return circuit, all joints shall be bonded, and periodic inspections shall be conducted to ensure that no condition of electrolysis or fire hazard exists by virtue of such use.

(e) The frames of all arc welding and cutting machines shall be grounded either through a third wire in the cable containing the circuit conductor or through a separate wire which is grounded at the source of the current. Grounding circuits, other than by means of the structure, shall be checked to ensure that the circuit between the ground and the grounded power conductor has resistance low enough to permit sufficient current to flow to cause the fuse or circuit breaker to interrupt the current.

(f) All ground connections shall be inspected to ensure that they are mechanically strong and electrically adequate for the required current.

(4) Operating instructions. Employers shall instruct employees in the safe means of arc welding and cutting as follows:

(a) When electrode holders are to be left unattended, the electrodes shall be removed and the holders shall be so placed or protected that they cannot make electrical contact with employees or conducting objects.

(b) Hot electrode holders shall not be dipped in water; to do so may expose the arc welder or cutter to electric shock.

(c) When the arc welder or cutter has occasion to leave his work or to stop work for any appreciable length of time, or when the arc welding or cutting machine is to be moved, the power supply switch to the equipment shall be opened.

(d) Any faulty or defective equipment shall be reported to the supervisor.

(e) See WAC 296-155-452 for additional requirements.

(5) Shielding. Whenever practical, all arc welding and cutting operations shall be shielded by noncombustible or flameproof screens which will protect employees and other persons working in the vicinity from the direct rays of the arc.

(6) Employee protection. Where welding or cutting operations are being performed in areas where it is possible for molten slag to contact other employees, those

employees shall be protected from being burned by providing overhead protection, barricading the impact area, or other effective means.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-155-405, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-405, filed 1/21/86; Order 74-26, § 296-155-405, filed 5/7/74, effective 6/6/74.]

**Part I
ELECTRICAL**

- WAC 296-115-425 Repealed.
- 296-155-426 Introduction.
- 296-155-428 General requirements.
- 296-155-429 Lockout and tagging of circuits.
- 296-155-430 Repealed.
- 296-155-432 Maintenance of equipment.
- 296-155-434 Environmental deterioration of equipment.
- 296-155-435 Repealed.
- 296-155-437 Batteries and battery charging.
- 296-155-440 Repealed.
- 296-155-441 Applicability.
- 296-155-444 General requirements.
- 296-155-447 Wiring design and protection.
- 296-155-449 Wiring methods, components, and equipment for general use.
- 296-155-450 Repealed.
- 296-155-452 Specific purpose equipment and installations.
- 296-155-455 Repealed.
- 296-155-456 Hazardous (classified) locations.
- 296-155-459 Special systems.
- 296-155-462 Definitions applicable to this part.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS SUBCHAPTER

- 296-155-425 Definitions applicable to this part. [Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-425, filed 1/21/86; Order 74-26, § 296-155-425, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
- 296-155-430 General requirements. [Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-430, filed 1/21/86; Order 77-20, § 296-155-430, filed 10/18/77; Order 77-12, § 296-155-430, filed 7/11/77; Order 74-26, § 296-155-430, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
- 296-155-435 Grounding and bonding. [Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-435, filed 1/21/86; Order 74-26, § 296-155-435, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
- 296-155-440 Equipment installation and maintenance. [Statutory Authority: RCW 49.17.040 and 49.17.050, 86-03-074 (Order 86-14), § 296-155-440, filed 1/21/86; Order 74-26, § 296-155-440, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
- 296-155-450 Battery rooms and battery charging. [Order 74-26, § 296-155-450, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.
- 296-155-455 Hazardous locations. [Order 74-26, § 296-155-455, filed 5/7/74, effective 6/6/74.] Repealed by 88-11-021 (Order 88-04), filed 5/11/88. Statutory Authority: Chapter 49.17 RCW.

WAC 296-155-425 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-155-426 Introduction. This part addresses electrical safety requirements that are necessary for the practical safeguarding of employees involved in construction work and is divided into four major divisions and applicable definitions as follows:

- (1) Introduction and definitions. Definitions applicable to this part are contained in WAC 296-155-462.
- (2) Installation safety requirements. Installation safety requirements are contained in WAC 296-155-441 through 296-155-459. Included in this category are electric equipment and installations used to provide electric power and light on jobsites.
- (3) Safety-related work practices. Safety-related work practices are contained in WAC 296-155-428 and 296-155-429. In addition to covering the hazards arising from the use of electricity at jobsites, these regulations also cover the hazards arising from the accidental contact, direct or indirect, by employees with all energized lines, above or below ground, passing through or near the jobsite.
- (4) Safety-related maintenance and environmental considerations. Safety-related maintenance and environmental considerations are contained in WAC 296-155-432 and 296-155-434.
- (5) Safety requirements for special equipment. Safety requirements for special equipment are contained in WAC 296-155-437.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-426, filed 5/11/88.]

WAC 296-155-428 General requirements. (1) Protection of employees.

- (a) No employer shall permit an employee to work in such proximity to any part of an electric power circuit that the employee could contact the electric power circuit in the course of work, unless the employee is protected against electric shock by de-energizing the circuit and grounding it or by guarding it effectively by insulation or other means.
- (b) No person, firm, corporation, or agent of same, shall require or permit any employee to perform any function in proximity to electrical conductors or to engage in any excavation, construction, demolition, repair, or other operation, unless and until danger from accidental contact with said electrical conductors has been effectively guarded by de-energizing the circuit and grounding it or by guarding it by effective insulation or other effective means.
- (c) Before work is begun the employer shall ascertain by inquiry or direct observation, or by instruments, whether any part of an energized electric power circuit, exposed or concealed, is so located that the performance of the work may bring any person, tool, or machine into physical or electrical contact with the electric power circuit. The employer shall post and maintain proper warning signs where such a circuit exists. The employer shall advise employees of the location of such lines, the

hazards involved, and the protective measures to be taken.

(d) No work shall be performed, no material shall be piled, stored or otherwise handled, no scaffolding, commercial signs, or structures shall be erected or dismantled, nor any tools, machinery or equipment operated within the specified minimum distances from any energized high voltage electrical conductor capable of energizing the material or equipment; except where the electrical distribution and transmission lines have been de-energized and visibly grounded at point of work, or where insulating barriers not a part of or an attachment to the equipment have been erected, to prevent physical contact with the lines, equipment shall be operated proximate to, under, over, by, or near energized conductors only in accordance with the following:

(i) For lines rated 50 kV. or below, minimum clearance between the lines and any part of the equipment or load shall be ten feet.

(ii) For lines rated over 50 kV. minimum clearance between the lines and any part of the equipment or load shall be ten feet plus 0.4 inch or each 1 kV. over 50 kV., or twice the length of the line insulator but never less than ten feet.

(e) If relocation of the electrical conductors is necessary, arrangements shall be made with the owners of the lines for such relocation.

(f) Barriers.

(i) Barriers shall be of such character and construction as to effectively provide the necessary protection without creating other hazards or jeopardizing the operation of the electrical circuits.

(ii) Barriers installed within the ten feet clearance from conductors shall be installed only under the supervision of authorized and qualified persons and this shall include a representative of the electrical utility or owner involved.

(g) Exceptions.

(i) These rules do not apply to the construction, reconstruction, operation, and maintenance, of overhead electrical lines, structures, and associated equipment by authorized and qualified electrical workers.

(ii) These rules do not apply to authorized and qualified employees engaged in the construction, reconstruction, operation, and maintenance, of overhead electrical circuits or conductors and associated equipment of rail transportation systems or electrical generating, transmission, distribution and communication systems which are covered by chapters 296-45 and 296-32 WAC.

(h) Special precautions must be taken.

(i) When handling any winch lines, guy wires, or other free cable, wire or rope in the vicinity of any electrical conductors.

(ii) When pulling a winch line, or other cable or rope under energized electrical conductors from a boom, mast, pile driver, etc., in such a manner as to make possible an approach to within ten feet of a conductor.

(iii) When there is possibility of a winch line, cable, etc., either becoming disconnected or breaking under load because of excessive strain and flipping up into overhead conductors.

(iv) When placing steel, concrete reinforcement, wire mesh, etc.

(v) When handling pipe or rod sections in connection with digging wells or test holes.

(vi) When moving construction equipment, apparatus, machinery, etc., all such movements must avoid striking supporting structures, guy wires, or other elements of the electrical utility system causing the conductors to so swing or move as to decrease clearances to less than ten feet from construction equipment, or to cause them to come together.

(i) Warning sign required.

(i) An approved durable warning sign legible at twelve feet, reading "It is unlawful to operate this equipment within ten feet of electrical conductors" shall be posted and maintained in plain view of the operator at the controls of each crane, derrick, shovel, drilling rig, pile driver or similar apparatus which is capable of vertical, lateral or swinging motion.

(ii) A similar sign shall be installed on the outside of the equipment and located as to be readily visible to mechanics or other persons engaged in the work operation.

(iii) Signs shall be not less than 6" x 8" dimensions with the word "WARNING" or "DANGER" in large letters and painted red across the top and the other letters in black painted on yellow background.

(j) Any overhead wire shall be considered to be an energized line until the owner of such line or the electrical utility authorities indicate that it is not an energized line and it has been visibly grounded.

(2) Passageways and open spaces.

(a) Barriers or other means of guarding shall be provided to ensure that workspace for electrical equipment will not be used as a passageway during periods when energized parts of electrical equipment are exposed.

(b) Working spaces, walkways, and similar locations shall be kept clear of cords so as not to create a tripping hazard to employees.

(3) Load ratings. In existing installations, no changes in circuit protection shall be made to increase the load in excess of the load rating of the circuit wiring.

(4) Fuses. When fuses are installed or removed with one or both terminals energized, special tools insulated for the voltage shall be used.

(5) Cords and cables.

(a) Worn or frayed electric cords or cables shall not be used.

(b) Extension cords shall not be fastened with staples, hung from nails, or suspended by wire.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-428, filed 5/11/88.]

WAC 296-155-429 Lockout and tagging of circuits.

(1) Controls. Controls that are deactivated during the course of work on energized or deenergized equipment or circuits shall be tagged and padlocked in the open position.

(2) Equipment and circuits. Equipment or circuits that are de-energized shall be rendered inoperative and

have tags and locked padlocks attached at all points where such equipment or circuits can be energized.

(3) Tags. Tags shall be placed to identify plainly the equipment or circuits being worked on.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-429, filed 5/11/88.]

WAC 296-155-430 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-155-432 Maintenance of equipment. The employer shall ensure that all wiring components and utilization equipment in hazardous locations are maintained in a dust-tight, dust-ignition-proof, or explosion-proof condition, as appropriate. There shall be no loose or missing screws, gaskets, threaded connections, seals, or other impairments to a tight condition.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-432, filed 5/11/88.]

WAC 296-155-434 Environmental deterioration of equipment. (1) Deteriorating agents.

(a) Unless identified for use in the operating environment, no conductors or equipment shall be located:

(i) In damp or wet locations;

(ii) Where exposed to gases, fumes, vapors, liquids, or other agents having a deteriorating effect on the conductors or equipment; or

(iii) Where exposed to excessive temperatures.

(b) Control equipment, utilization equipment, and busways approved for use in dry locations only shall be protected against damage from the weather during building construction.

(2) Protection against corrosion. Metal raceways, cable armor, boxes, cable sheathing, cabinets, elbows, couplings, fittings, supports, and support hardware shall be of materials appropriate for the environment in which they are to be installed.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-434, filed 5/11/88.]

WAC 296-155-435 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-155-437 Batteries and battery charging. (1) General requirements.

(a) Batteries of the unsealed type shall be located in enclosures with outside vents or in well ventilated rooms and shall be arranged so as to prevent the escape of fumes, gases, or electrolyte spray into other areas.

(b) Ventilation shall be provided to ensure diffusion of the gases from the battery and to prevent the accumulation of an explosive mixture.

(c) Racks and trays shall be substantial and shall be treated to make them resistant to the electrolyte.

(d) Floors shall be of acid resistant construction unless protected from acid accumulations.

(e) Face shields, aprons, and rubber gloves shall be provided for and worn by workers handling acids or batteries.

(f) Facilities for quick drenching of the eyes and body shall be provided within 25 feet (7.62 m) of battery handling areas.

(g) Facilities shall be provided for flushing and neutralizing spilled electrolyte and for fire protection.

(2) Charging.

(a) Battery charging installations shall be located in areas designated for that purpose.

(b) Charging apparatus shall be protected from damage by trucks.

(c) When batteries are being charged, the vent caps shall be kept in place to avoid electrolyte spray. Vent caps shall be maintained in functioning condition.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-437, filed 5/11/88.]

WAC 296-155-440 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-155-441 Applicability. (1) Covered. WAC 296-155-441 through 296-155-459 contain installation safety requirements for electrical equipment and installations used to provide electric power and light at the jobsite. These sections apply to installations, both temporary and permanent, used on the jobsite; but these sections do not apply to existing permanent installations that were in place before the construction activity commenced.

Note: If the electrical installation is made in accordance with the National Electrical Code ANSI/NFPA 70-1984, exclusive of formal interpretations and tentative interim amendments, it will be deemed to be in compliance with WAC 296-155-444 through 296-155-459, except for WAC 296-155-447 (2)(a) and 296-155-449 (1)(b)(ii)(E), (F), (G), and (J).

(2) Not covered. WAC 296-155-441 through 296-155-459 do not cover installations used for the generation, transmission, and distribution of electric energy, including related communication, metering, control, and transformation installations. (However, these regulations do cover portable and vehicle-mounted generators used to provide power for equipment used at the jobsite.) See chapter 296-44 WAC, Safety standards—Electrical Construction Code, for the construction of power distribution and transmission lines.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-441, filed 5/11/88.]

WAC 296-155-444 General requirements. (1) Approval. All electrical conductors and equipment shall be approved.

(2) Examination, installation, and use of equipment.

(a) Examination. The employer shall ensure that electrical equipment is free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined on the basis of the following considerations:

(i) Suitability for installation and use in conformity with the provisions of this part. Suitability of equipment for an identified purpose may be evidenced by listing, labeling, or certification for that identified purpose.

(ii) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided.

(iii) Electrical insulation.

(iv) Heating effects under conditions of use.

(v) Arcing effects.

(vi) Classification by type, size, voltage, current capacity, specific use.

(vii) Other factors which contribute to the practical safeguarding of employees using or likely to come in contact with the equipment.

(b) Installation and use. Listed, labeled, or certified equipment shall be installed and used in accordance with instructions included in the listing, labeling, or certification.

(3) Interrupting rating. Equipment intended to break current shall have an interrupting rating at system voltage sufficient for the current that must be interrupted.

(4) Mounting and cooling of equipment.

(a) Mounting. Electric equipment shall be firmly secured to the surface on which it is mounted. Wooden plugs driven into holes in masonry, concrete, plaster, or similar materials shall not be used.

(b) Cooling. Electrical equipment which depends upon the natural circulation of air and convection principles for cooling of exposed surfaces shall be installed so that room air flow over such surfaces is not prevented by walls or by adjacent installed equipment. For equipment designed for floor mounting, clearance between top surfaces and adjacent surfaces shall be provided to dissipate rising warm air. Electrical equipment provided with ventilating openings shall be installed so that walls or other obstructions do not prevent the free circulation of air through the equipment.

(5) Splices. Conductors shall be spliced or joined with splicing devices designed for the use or by brazing, welding, or soldering with a fusible metal or alloy. Soldered splices shall first be so spliced or joined as to be mechanically and electrically secure without solder and then soldered. All splices and joints and the free ends of conductors shall be covered with an insulation equivalent to that of the conductors or with an insulating device designed for the purpose.

(6) Arcing parts. Parts of electric equipment which in ordinary operation produce arcs, sparks, flames, or molten metal shall be enclosed or separated and isolated from all combustible material.

(7) Marking. Electrical equipment shall not be used unless the manufacturer's name, trademark, or other descriptive marking by which the organization responsible for the product may be identified is placed on the equipment and unless other markings are provided giving voltage, current, wattage, or other ratings as necessary. The marking shall be of sufficient durability to withstand the environment involved.

(8) Identification of disconnecting means and circuits. Each disconnecting means required by this part for motors and appliances shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. Each service, feeder, and branch circuit, at its

disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

(9) Construction site. Precautions shall be taken to make any necessary open wiring inaccessible to unauthorized personnel.

(10) 750 volts, nominal, or less. This subsection applies to equipment operating at 750 volts, nominal, or less.

(a) Working space about electric equipment. Sufficient access and working space shall be provided and maintained about all electric equipment to permit ready and safe operation and maintenance of such equipment.

(i) Working clearances. Except as required or permitted elsewhere in this part, the dimension of the working space in the direction of access to live parts operating at 750 volts or less and likely to require examination, adjustment, servicing, or maintenance while alive shall not be less than indicated in Table I-1. In addition to the dimensions shown in Table I-1, workspace shall not be less than 30 inches (762 mm) wide in front of the electric equipment. Distances shall be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. Walls constructed of concrete, brick, or tile are considered to be grounded. Working space is not required in back of assemblies such as dead-front switchboards or motor control centers where there are no renewable or adjustable parts such as fuses or switches on the back and where all connections are accessible from locations other than the back.

Table I-1
Working Clearances

Nominal Voltage to Ground	Minimum Clear Distance for Conditions ¹		
	(a)	(b)	(c)
	Feet ²	Feet ²	Feet ²
0-150	3	3	3
151-750	3	3 1/2	4

¹Conditions (a), (b), and (c) are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating material. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side. (c) Exposed live parts on both sides of the workspace not guarded provided in condition (a) with the operator between.

²Note—For International System of Units (SI): One foot=0.3048m.

(ii) Clear spaces. Working space required by this part shall not be used for storage. When normally enclosed live parts are exposed for inspection or servicing, the working space, if in a passageway or general open space, shall be guarded.

(iii) Access and entrance to working space. At least one entrance shall be provided to give access to the working space about electric equipment.

(iv) Front working space. Where there are live parts normally exposed on the front of switchboards or motor control centers, the working space in front of such equipment shall not be less than 3 feet (914 mm).

(v) Headroom. The minimum headroom of working spaces about service equipment, switchboards, panelboards, or motor control centers shall be 6 feet 3 inches (1.91 m).

(b) Guarding of live parts.

(i) Except as required or permitted elsewhere in this part, live parts of electric equipment operating at 50 volts or more shall be guarded against accidental contact by cabinets or other forms of enclosures, or by any of the following means:

(A) By location in a room, vault, or similar enclosure that is accessible only to qualified persons.

(B) By partitions or screens so arranged that only qualified persons will have access to the space within reach of the live parts. Any openings in such partitions or screens shall be so sized and located that persons are not likely to come into accidental contact with the live parts or to bring conducting objects into contact with them.

(C) By location on a balcony, gallery, or platform so elevated and arranged as to exclude unqualified persons.

(D) By elevation of 8 feet (2.44 m) or more above the floor or other working surface and so installed as to exclude unqualified persons.

(ii) In locations where electric equipment would be exposed to physical damage, enclosures or guards shall be so arranged and of such strength as to prevent such damage.

(iii) Entrances to rooms and other guarded locations containing exposed live parts shall be marked with conspicuous warning signs forbidding unqualified persons to enter.

(11) Over 750 volts, nominal.

(a) General. Conductors and equipment used on circuits exceeding 750 volts, nominal, shall comply with all applicable provisions of subsections (1) through (7) of this section and with the following provisions which supplement or modify those requirements. The provisions of (b), (c), and (d) of this subsection do not apply to equipment on the supply side of the service conductors.

(b) Enclosure for electrical installations. Electrical installations in a vault, room, closet or in an area surrounded by a wall, screen, or fence, access to which is controlled by lock and key or other equivalent means, are considered to be accessible to qualified persons only. A wall, screen, or fence less than 8 feet (2.44 m) in height is not considered adequate to prevent access unless it has other features that provide a degree of isolation equivalent to an 8 foot (2.44 m) fence. The entrances to all buildings, rooms or enclosures containing exposed live parts or exposed conductors operating at over 750 volts, nominal, shall be kept locked or shall be under the observation of a qualified person at all times.

(i) Installations accessible to qualified persons only. Electrical installations having exposed live parts shall be accessible to qualified persons only and shall comply with the applicable provisions of (c) of this subsection.

(ii) Installations accessible to unqualified persons. Electrical installations that are open to unqualified persons shall be made with metal-enclosed equipment or shall be enclosed in a vault or in an area, access to which is controlled by a lock. Metal-enclosed switchgear, unit substations, transformers, pull boxes, connection boxes, and other similar associated equipment shall be marked with appropriate caution signs. If equipment is exposed to physical damage from vehicular traffic, guards shall be provided to prevent such damage. Ventilating or similar openings in metal-enclosed equipment shall be designed so that foreign objects inserted through these openings will be deflected from energized parts.

(c) Workspace about equipment. Sufficient space shall be provided and maintained about electric equipment to permit ready and safe operation and maintenance of such equipment. Where energized parts are exposed, the minimum clear workspace shall not be less than 6 feet 6 inches (1.98 m) high (measured vertically from the floor or platform,) or less than 3 feet (914 mm) wide (measured parallel to the equipment.) The depth shall be as required in Table I-2. The workspace shall be adequate to permit at least a ninety degree opening of doors or hinged panels.

(i) Working space. The minimum clear working space in front of electric equipment such as switchboards, control panels, switches, circuit breakers, motor controllers, relays, and similar equipment shall not be less than specified in Table I-2 unless otherwise specified in this part. Distances shall be measured from the live parts if they are exposed, or from the enclosure front or opening if the live parts are enclosed. However, working space is not required in back of equipment such as deadfront switchboards or control assemblies where there are no renewable or adjustable parts (such as fuses or switches) on the back and where all connections are accessible from locations other than the back. Where rear access is required to work on de-energized parts on the back of enclosed equipment, a minimum working space of 30 inches (762 mm) horizontally shall be provided.

Table I-2
Minimum Depth of Clear Working Space in Front of Electric Equipment

Nominal Voltage to Ground	Minimum Clear Distance for Conditions ¹		
	(a)	(b)	(c)
	Feet ²	Feet ²	Feet ²
751 to 2,500	3	4	5
2,501 to 9,000	4	5	6
9,001 to 25,000	5	6	9

Nominal Voltage to Ground	Minimum Clear Distance for Conditions ¹		
	(a)	(b)	(c)
	Feet ²	Feet ²	Feet ²
25,001 to 75kV	6	8	10
Above 75kV	8	10	12

¹Conditions (a), (b), and (c) are as follows: (a) Exposed live parts on one side and no live or grounded parts on the other side of the working space, or exposed live parts on both sides effectively guarded by insulating materials. Insulated wire or insulated busbars operating at not over 300 volts are not considered live parts. (b) Exposed live parts on one side and grounded parts on the other side. Walls constructed of concrete, brick, or the tile are considered to be grounded surfaces. (c) Exposed live parts on both sides of the workspace (not guarded as provided in Condition (a)) with the operator between.

²Note—For SI units: One foot=0.3048m.

(ii) Lighting outlets and points of control. The lighting outlets shall be so arranged that persons changing lamps or making repairs on the lighting system will not be endangered by live parts or other equipment. The points of control shall be so located that persons are not likely to come in contact with any live part or moving part of the equipment while turning on the lights.

(iii) Elevation of unguarded live parts. Unguarded live parts above working space shall be maintained at elevations not less than specified in Table I-3.

Table I-3
Elevation of Unguarded Energized Parts Above Working Space

Nominal Voltage to Between Phases	Minimum Elevation
751, 7,500	8 feet 6 inches ¹
7,501 to 35,000	9 feet
Over 35kV	9 feet + 0.37 inches per kV above 35kV

¹ Note—For SI units: One inch=25.4mm, one foot=0.3048m.

(d) Entrance and access to workspace. At least one entrance not less than 24 inches (610 mm) wide and 6 feet 6 inches (1.98 m) high shall be provided to give access to the working space about electric equipment. On switchboard and control panels exceeding 48 inches (1.22 m) in width, there shall be one entrance at each end of such board where practicable. Where bare energized parts at any voltage or insulated energized parts above 750 volts are located adjacent to such entrance, they shall be guarded.

(12) Welding and cutting equipment. Welding and cutting equipment shall meet the requirements specified in Parts D and H of this chapter.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-444 filed 5/11/88.]

WAC 296-155-447 Wiring design and protection.

(1) Use and identification of grounded and grounding conductors.

(a) Identification of conductors. A conductor used as a grounded conductor shall be identifiable and distinguishable from all other conductors. A conductor used as an equipment grounding conductor shall be identifiable and distinguishable from all other conductors.

(b) Polarity of connections. No grounded conductor shall be attached to any terminal or lead so as to reverse designated polarity.

(c) Use of grounding terminals and devices. A grounding terminal or grounding-type device on a receptacle, cord connector, or attachment plug shall not be used for purposes other than grounding.

(2) Branch circuits.

(a) Ground-fault protection.

(i) General. The employer shall use either ground-fault circuit interrupters as specified in (a)(ii) of this subsection or an assured equipment grounding conductor program as specified in (a)(iii) of this subsection to protect employees on construction sites. These requirements are in addition to any other requirements for equipment grounding conductors.

(ii) Ground-fault circuit interrupters. All 120-volt, single-phase, 15-ampere and 20-ampere receptacle outlets on construction sites, which are not a part of the permanent wiring of the building or structure and which are in use by employees, shall have approved ground-fault circuit interrupters for personnel protection. Receptacles on a two-wire, single-phase portable or vehicle-mounted generator rated not more than 5kW, where the circuit conductors of the generator are insulated from the generator frame and all other grounded surfaces, need not be protected with ground-fault circuit interrupters.

(iii) Assured equipment grounding conductor program. The employer shall establish and implement an assured equipment grounding conductor program on construction sites covering all cord sets, receptacles which are not a part of the building or structure, and equipment connected by cord and plug which are available for use or used by employees. This program shall comply with the following minimum requirements:

(A) A written description of the program, including the specific procedures adopted by the employer, shall be available at the jobsite for inspection and copying by the director and any affected employee.

(B) The employer shall designate one or more competent persons (as defined in WAC 296-155-012(4)) to implement the program, and to perform continuing tests and inspections as required.

(C) Each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected before each day's use for external defects, such as deformed or missing pins or insulation damage, and for indications of possible internal damage. Equipment found damaged or defective shall not be used until repaired.

(D) The following tests shall be performed on all cord sets, receptacles which are not a part of the permanent wiring of the building or structure, and cord-connected and plug-connected equipment required to be grounded:

(I) All equipment grounding conductors shall be tested for continuity and shall be electrically continuous.

(II) Each receptacle and attachment cap or plug shall be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor shall be connected to its proper terminal.

(III) Each outlet receptacle, or power source shall be tested to ensure proper polarity.

(E) All required tests shall be performed:

(I) Before first use;

(II) Before equipment is returned to service following any repairs;

(III) Before equipment is used after any incident which can be reasonably suspected to have caused damage (for example, when a cord set is run over); and

(IV) At intervals not to exceed 3 months, except that cord sets and receptacles which are fixed and not exposed to damage shall be tested at intervals not exceeding 6 months.

(F) The employer shall not make available or permit the use by employees of any equipment which has not met the requirements of (a)(iii) of this subsection.

(G) Tests performed as required in this subsection shall be recorded. This test record shall identify each receptacle, cord set, and cord-connected and plug-connected equipment that passed the test and shall indicate the last date it was tested or the interval for which it was tested. This record shall be kept by means of logs, color coding, or other effective means and shall be maintained until replaced by a more current record. The record shall be made available on the jobsite for inspection by the director and any affected employee.

(b) Outlet devices. Outlet devices shall have an ampere rating not less than the load to be served and shall comply with the following:

(i) Single receptacles. A single receptacle installed on an individual branch circuit shall have an ampere rating of not less than that of the branch circuit.

(ii) Two or more receptacles. Where connected to a branch circuit supplying two or more receptacles or outlets, receptacle ratings shall conform to the values listed in Table I-4.

(iii) Receptacles used for the connection of motors. The rating of an attachment plug or receptacle used for cord-connection and plug-connection of a motor to a branch circuit shall not exceed 15 amperes at 125 volts or 10 amperes at 250 volts if individual overload protection is omitted.

Table I-4
Receptacle Ratings for Various Size Circuits

Circuit Rating Amperes	Receptacle Rating Amperes
15	Not Over 15
20	15 or 20
30	30
40	40 or 50
50	50

(3) Outside conductors and lamps.

(a) 750 volts, nominal, or less. (a)(i) through (iv)(D) of this subsection apply to branch circuit, feeder, and service conductors rated 750 volts, nominal, or less and run outdoors as open conductors.

(i) Conductors on poles. Conductors supported on poles shall provide a horizontal climbing space not less than the following:

(A) Power conductors below communication conductors: 30 inches (762 mm).

(B) Power conductors alone or above communication conductors: 300 volts or less—24 inches (610 mm); more than 300 volts—30 inches (762 mm).

(C) Communication conductors below power conductors: With power conductors 300 volts or less—24 inches (610 mm); more than 300 volts—30 inches (762 mm).

(ii) Clearance from ground. Open conductors shall conform to the following minimum clearances:

(A) 10 feet (3.05 m)—above finished grade, sidewalks, or from any platform or projection from which they might be reached.

(B) 12 feet (3.66 m)—over areas subject to vehicular traffic other than truck traffic.

(C) 15 feet (4.57 m)—over areas other than those specified in (a)(ii)(D) of this subsection that are subject to truck traffic.

(D) 18 feet (5.49 m)—over public streets, alleys, roads, and driveways.

(iii) Clearance from building openings. Conductors shall have a clearance of at least 3 feet (914 mm) from windows, doors, fire escapes, or similar locations. Conductors run above the top level of a window are considered to be out of reach from that window and, therefore, do not have to be 3 feet (914 mm) away.

(iv) Clearance over roofs. Conductors above roof space accessible to employees on foot shall have a clearance from the highest point of the roof surface of not less than 8 feet (2.44 m) vertical clearance for insulated conductors, not less than 10 feet (3.05 m) vertical or diagonal clearance for covered conductors, and not less than 15 feet (4.57 m) for bare conductors, except that:

(A) Where the roof space is also accessible to vehicular traffic, the vertical clearance shall not be less than 18 feet (5.49 m); or

(B) Where the roof space is not normally accessible to employees on foot, fully insulated conductors shall have

a vertical or diagonal clearance of not less than 3 feet (914 mm); or

(C) Where the voltage between conductors is 300 volts or less and the roof has a slope of not less than 4 inches (102 mm) in 12 inches (305 mm), the clearance from roofs shall be at least 3 feet (914 mm); or

(D) Where the voltage between conductors is 300 volts or less and the conductors do not pass over more than 4 feet (1.22 m) of the overhang portion of the roof and they are terminated at a through-the-roof raceway or support, the clearance from roofs shall be at least 18 inches (457 mm).

(b) Location of outdoor lamps. Lamps for outdoor lighting shall be located below all live conductors, transformers, or other electric equipment, unless such equipment is controlled by a disconnecting means that can be locked in the open position or unless adequate clearances or other safeguards are provided for relamping operations.

(4) Services.

(a) Disconnecting means.

(i) General. Means shall be provided to disconnect all conductors in a building or other structure from the service-entrance conductors. The disconnecting means shall plainly indicate whether it is in the open or closed position and shall be installed at a readily accessible location nearest the point of entrance of the service-entrance conductors.

(ii) Simultaneous opening of poles. Each service disconnecting means shall simultaneously disconnect all ungrounded conductors.

(b) Services over 750 volts, nominal. The following additional requirements apply to services over 750 volts, nominal.

(i) Guarding. Service-entrance conductors installed as open wires shall be guarded to make them accessible only to qualified persons.

(ii) Warning signs. Signs warning of high voltage shall be posted where unauthorized employees might come in contact with live parts.

(5) Overcurrent protection.

(a) 750 volts, nominal, or less. The following requirements apply to overcurrent protection of circuits rated 750 volts, nominal, or less.

(i) Protection of conductors and equipment. Conductors and equipment shall be protected from overcurrent in accordance with their ability to safely conduct current. Conductors shall have sufficient ampacity to carry the load.

(ii) Grounded conductors. Except for motor-running overload protection, overcurrent devices shall not interrupt the continuity of the grounded conductor unless all conductors of the circuit are opened simultaneously.

(iii) Disconnection of fuses and thermal cutouts. Except for devices provided for current-limiting on the supply side of the service disconnecting means, all cartridge fuses which are accessible to other than qualified persons and all fuses and thermal cutouts on circuits over 150 volts to ground shall be provided with disconnecting means. This disconnecting means shall be installed so that the fuse or thermal cutout can be

disconnected from its supply without disrupting service to equipment and circuits unrelated to those protected by the overcurrent device.

(iv) Location in or on premises. Overcurrent devices shall be readily accessible. Overcurrent devices shall not be located where they could create an employee safety hazard by being exposed to physical damage or located in the vicinity of easily ignitable material.

(v) Arcing or suddenly moving parts. Fuses and circuit breakers shall be so located or shielded that employees will not be burned or otherwise injured by their operation.

(vi) Circuit breakers.

(A) Circuit breakers shall clearly indicate whether they are in the open (off) or closed (on) position.

(B) Where circuit breaker handles on switchboards are operated vertically rather than horizontally or rotationally, the up position of the handle shall be the closed (on) position.

(C) If used as switches in 120-volt, fluorescent lighting circuits, circuit breakers shall be marked "SWD."

(b) Over 750 volts, nominal. Feeders and branch circuits over 750 volts, nominal, shall have short-circuit protection.

(6) Effective grounding. The path from circuits, equipment, structures, and conduit or enclosures to ground shall be permanent and continuous; have ample carrying capacity to conduct safely the currents liable to be imposed on it; and have the impedance sufficiently low to limit the potential above ground and to result in the operation of the overcurrent devices in the circuit.

(a) through (k) of this subsection contain grounding requirements for systems, circuits, and equipment.

(a) Systems to be grounded. The following systems which supply premises wiring shall be grounded:

(i) Three-wire DC systems. All three-wire DC systems shall have their neutral conductor grounded.

(ii) Two-wire DC systems. Two-wire DC systems operating at over 50 volts through 300 volts between conductors shall be grounded unless they are rectifier-derived from an AC system complying with (a)(iii), (iv), and (v) of this subsection.

(iii) AC circuits, less than 50 volts. AC circuits of less than 50 volts shall be grounded if they are installed as overhead conductors outside of buildings or if they are supplied by transformers and the transformer primary supply system is ungrounded or exceeds 150 volts to ground.

(iv) AC systems, 50 volts to 1000 volts. AC systems of 50 volts to 1000 volts shall be grounded under any of the following conditions, unless exempted by (a)(v) of this subsection:

(A) If the system can be so grounded that the maximum voltage to ground on the ungrounded conductors does not exceed 150 volts;

(B) If the system is nominally rated 480Y/277 volt, 3-phase, 4-wire in which the neutral is used as a circuit conductor;

(C) If the system is nominally rated 240/120 volt, 3-phase, 4-wire in which the midpoint of one phase is used as a circuit conductor; or

(D) If a service conductor is uninsulated.

(v) Exceptions. AC systems of 50 volts to 1000 volts are not required to be grounded if the system is separately derived and is supplied by a transformer that has a primary voltage rating less than 1000 volts, provided all of the following conditions are met:

(A) The system is used exclusively for control circuits;

(B) The conditions of maintenance and supervision assure that only qualified persons will service the installation;

(C) Continuity of control power is required; and

(D) Ground detectors are installed on the control system.

(b) Separately derived systems. Where (a) of this subsection requires grounding of wiring systems whose power is derived from generator, transformer, or converter windings and has no direct electrical connection, including a solidly connected grounded circuit conductor, to supply conductors originating in another system, (e) of this subsection shall also apply.

(c) Portable and vehicle-mounted generators.

(i) Portable generators. Under the following conditions, the frame of a portable generator need not be grounded and may serve as the grounding electrode for a system supplied by the generator:

(A) The generator supplies only equipment mounted on the generator and/or cord-connected and plug-connected equipment through receptacles mounted on the generator; and

(B) The noncurrent-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame.

(ii) Vehicle-mounted generators. Under the following conditions the frame of a vehicle may serve as the grounding electrode for a system supplied by a generator located on the vehicle:

(A) The frame of the generator is bonded to the vehicle frame; and

(B) The generator supplies only equipment located on the vehicle and/or cord-connected and plug-connected equipment through receptacles mounted on the vehicle or on the generator; and

(C) The noncurrent-carrying metal parts of equipment and the equipment grounding conductor terminals of the receptacles are bonded to the generator frame; and

(D) The system complies with all other provisions of this section.

(iii) Neutral conductor bonding. A neutral conductor shall be bonded to the generator frame if the generator is a component of a separately derived system. No other conductor need be bonded to the generator frame.

(d) Conductors to be grounded. For AC premises wiring systems the identified conductor shall be grounded.

(e) Grounding connections.

(i) Grounded system. For a grounded system, a grounding electrode conductor shall be used to connect both the equipment grounding conductor and the grounded circuit conductor to the grounding electrode. Both the equipment grounding conductor and the grounding electrode conductor shall be connected to the

grounded circuit conductor on the supply side of the service disconnecting means, or on the supply side of the system disconnecting means or overcurrent devices if the system is separately derived.

(ii) Ungrounded systems. For an ungrounded service-supplied system, the equipment grounding conductor shall be connected to the grounding electrode conductor at the service equipment. For an ungrounded separately derived system, the equipment grounding conductor shall be connected to the grounding electrode conductor at, or ahead of, the system disconnecting means or overcurrent devices.

(f) Grounding path. The path to ground from circuits, equipment, and enclosures shall be permanent and continuous.

(g) Supports, enclosures, and equipment to be grounded.

(i) Supports and enclosures for conductors. Metal cable trays, metal raceways, and metal enclosures for conductors shall be grounded, except that:

(A) Metal enclosures such as sleeves that are used to protect cable assemblies from physical damage need not be grounded; and

(B) Metal enclosures for conductors added to existing installations of open wire, knob-and-tube wiring, and nonmetallic-sheathed cable need not be grounded if all of the following conditions are met:

(I) Runs are less than 25 feet (7.62 m);

(II) Enclosures are free from probable contact with ground, grounded metal, metal laths, or other conductive materials; and

(III) Enclosures are guarded against employee contact.

(ii) Service equipment enclosures. Metal enclosures for service equipment shall be grounded.

(iii) Fixed equipment. Exposed noncurrent-carrying metal parts of fixed equipment which may become energized shall be grounded under any of the following conditions:

(A) If within 8 feet (2.44 m) vertically or 5 feet (1.52 m) horizontally of ground or grounded metal objects and subject to employee contact.

(B) If located in a wet or damp location and subject to employee contact.

(C) If in electrical contact with metal.

(D) If in a hazardous (classified) location.

(E) If supplied by a metal-clad, metal-sheathed, or grounded metal raceway wiring method.

(F) If equipment operates with any terminal at over 150 volts to ground; however, the following need not be grounded:

(I) Enclosures for switches or circuit breakers used for other than service equipment and accessible to qualified persons only;

(II) Metal frames of electrically heated appliances which are permanently and effectively insulated from ground; and

(III) The cases of distribution apparatus such as transformers and capacitors mounted on wooden poles at a height exceeding 8 feet (2.44 m) above ground or grade level.

(iv) Equipment connected by cord and plug. Under any of the conditions described in (g)(iv)(A) through (C) of this subsection, exposed noncurrent-carrying metal parts of cord-connected and plug-connected equipment which may become energized shall be grounded:

(A) If in a hazardous (classified) location (see WAC 296-155-444).

(B) If operated at over 150 volts to ground, except for guarded motors and metal frames of electrically heated appliances if the appliance frames are permanently and effectively insulated from ground.

(C) If the equipment is one of the types listed in (g)(iv)(C)(I) through (V) of this subsection. However, even though the equipment may be one of these types, it need not be grounded if it is exempted by (g)(iv)(C)(VI) of this subsection.

(I) Hand held motor-operated tools;

(II) Cord-connected and plug-connected equipment used in damp or wet locations or by employees standing on the ground or on metal floors or working inside of metal tanks or boilers;

(III) Portable and mobile x-ray and associated equipment;

(IV) Tools likely to be used in wet and/or conductive locations; and

(V) Portable hand lamps.

(VI) Tools likely to be used in wet and/or conductive locations need not be grounded if supplied through an isolating transformer with an ungrounded secondary of not over 50 volts. Listed or labeled portable tools and appliances protected by a system of double insulation, or its equivalent, need not be grounded. If such a system is employed, the equipment shall be distinctively marked to indicate that the tool or appliance utilizes a system of double insulation.

(v) Nonelectrical equipment. The metal parts of the following nonelectrical equipment shall be grounded: Frames and tracks of electrically operated cranes; frames of nonelectrically driven elevator cars to which electric conductors are attached; hand-operated metal shifting ropes or cables of electric elevators, and metal partitions, grill work, and similar metal enclosures around equipment of over 1kV between conductors.

(h) Methods of grounding equipment.

(i) With circuit conductors. Noncurrent-carrying metal parts of fixed equipment, if required to be grounded by this part, shall be grounded by an equipment grounding conductor which is contained within the same raceway, cable, or cord, or runs with or encloses the circuit conductors. For DC circuits only, the equipment grounding conductor may be run separately from the circuit conductors.

(ii) Grounding conductor. A conductor used for grounding fixed or movable equipment shall have capacity to conduct safely any fault current which may be imposed on it.

(iii) Equipment considered effectively grounded. Electric equipment is considered to be effectively grounded if it is secured to, and in electrical contact with, a metal rack or structure that is provided for its support and the

metal rack or structure is grounded by the method specified for the noncurrent-carrying metal parts of fixed equipment in (h)(i) of this subsection. Metal car frames supported by metal hoisting cables attached to or running over metal sheaves or drums of grounded elevator machines are also considered to be effectively grounded.

(i) Bonding.

(i) If bonding conductors are used to assure electrical continuity, they shall have the capacity to conduct any fault current which may be imposed.

(ii) When attaching bonding and grounding clamps or clips, a secure and positive metal-to-metal contact shall be made. Such attachments shall be made before closures are opened and material movements are started and shall not be broken until after material movements are stopped and closures are made.

(j) Made electrodes. If made electrodes are used, they shall be free from nonconductive coatings, such as paint or enamel; and, if practicable, they shall be embedded below permanent moisture level. A single electrode consisting of a rod, pipe or plate which has a resistance to ground greater than 25 ohms shall be augmented by one additional electrode installed no closer than 6 feet (1.83 m) to the first electrode.

(k) Grounding of systems and circuits of 1000 volts and over (high voltage).

(i) General. If high voltage systems are grounded, they shall comply with all applicable provisions of (a) through (j) of this subsection as supplemented and modified by (k) of this subsection.

(ii) Grounding of systems supplying portable or mobile equipment. Systems supplying portable or mobile high voltage equipment, other than substations installed on a temporary basis, shall comply with the following:

(A) Portable and mobile high voltage equipment shall be supplied from a system having its neutral grounded through an impedance. If a delta-connected high voltage system is used to supply the equipment, a system neutral shall be derived.

(B) Exposed noncurrent-carrying metal parts of portable and mobile equipment shall be connected by an equipment grounding conductor to the point at which the system neutral impedance is grounded.

(C) Ground-fault detection and relaying shall be provided to automatically deenergize any high voltage system component which has developed a ground fault. The continuity of the equipment grounding conductor shall be continuously monitored so as to de-energize automatically the high voltage feeder to the portable equipment upon loss of continuity of the equipment grounding conductor.

(D) The grounding electrode to which the portable or mobile equipment system neutral impedance is connected shall be isolated from and separated in the ground by at least 20 feet (6.1 m) from any other system or equipment grounding electrode, and there shall be no direct connection between the grounding electrodes, such as buried pipe, fence or like objects.

(iii) Grounding of equipment. All noncurrent-carrying metal parts of portable equipment and fixed equipment including their associated fences, housings,

enclosures, and supporting structures shall be grounded. However, equipment which is guarded by location and isolated from ground need not be grounded. Additionally, pole-mounted distribution apparatus at a height exceeding 8 feet (2.44 m) above ground or grade level need not be grounded.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-447 filed 5/11/88.]

WAC 296-155-449 Wiring methods, components, and equipment for general use. (1) Wiring methods. The provisions of this subsection do not apply to conductors which form an integral part of equipment such as motors, controllers, motor control centers and like equipment.

(a) General requirements.

(i) Electrical continuity of metal raceways and enclosures. Metal raceways, cable armor, and other metal enclosures for conductors shall be metallically joined together into a continuous electric conductor and shall be so connected to all boxes, fittings, and cabinets as to provide effective electrical continuity.

(ii) Wiring in ducts. No wiring systems of any type shall be installed in ducts used to transport dust, loose stock or flammable vapors. No wiring system of any type shall be installed in any duct used for vapor removal or in any shaft containing only such ducts.

(iii) Receptacles for attachment plugs shall be approved, concealed contact type with a contact for extending ground continuity and shall be so designed and constructed that the plug may be pulled out without leaving any live parts exposed to accidental contact. All temporary outlet boxes shall be of a type suitable for use in wet or damp locations.

(iv) Attachment plugs or other connectors supplying equipment at more than 300 volts shall be of the skirted type or otherwise so designed that arcs will be confined.

(b) Temporary wiring.

(i) Scope. The provisions of (b) of this subsection apply to temporary electrical power and lighting wiring methods which may be of a class less than would be required for a permanent installation. Except as specifically modified in (b) of this subsection, all other requirements of this part for permanent wiring shall apply to temporary wiring installations. Temporary wiring shall be removed immediately upon completion of construction or the purpose for which the wiring was installed.

(ii) General requirements for temporary wiring.

(A) Feeders shall originate in a distribution center. The conductors shall be run as multiconductor cord or cable assemblies or within raceways; or, where not subject to physical damage, they may be run as open conductors on insulators not more than 10 feet (3.05 m) apart.

(B) Branch circuits shall originate in a power outlet or panelboard. Conductors shall be run as multiconductor cord or cable assemblies or open conductors, or shall be run in raceways. All conductors shall be protected by overcurrent devices at their ampacity. Runs of open conductors shall be located where the conductors will

not be subject to physical damage, and the conductors shall be fastened at intervals not exceeding 10 feet (3.05 m). No branch-circuit conductors shall be laid on the floor. Each branch circuit that supplies receptacles or fixed equipment shall contain a separate equipment grounding conductor if the branch circuit is run as open conductors.

(C) Receptacles shall be of the grounding type. Unless installed in a complete metallic raceway, each branch circuit shall contain a separate equipment grounding conductor, and all receptacles shall be electrically connected to the grounding conductor. Receptacles for uses other than temporary lighting shall not be installed on branch circuits which supply temporary lighting. Receptacles shall not be connected to the same ungrounded conductor of multiwire circuits which supply temporary lighting.

(D) Disconnecting switches or plug connectors shall be installed to permit the disconnection of all ungrounded conductors of each temporary circuit.

(E) Temporary lights shall be protected by guards of a nonconductive or insulated material to prevent accidental contact with the bulb, except that guards are not required when the construction of the reflector is such that the bulb is deeply recessed.

(F) Temporary lights shall be equipped with hard usage (S or SJ types) electric cords with connections and insulation maintained in safe condition. "Brewery" cord (type CBO or NB) may be substituted for hard usage cord provided it is protected from physical damages. Temporary lights shall not be suspended by their electric cords unless cords and lights are designed for this means of suspension. Splices shall retain the insulation, outer sheath properties, flexibility, and usage characteristics of the cord being spliced.

When pin-type connectors or lampholders are utilized, the area of perforations caused by lampholder removal shall be restored to the insulation capabilities of the cord.

(G) Portable electric lighting used in wet and/or other conductive locations, as for example, drums, tanks, and vessels, shall be operated at 12 volts or less. However, 120-volt lights may be used if protected by a ground-fault circuit interrupter.

(H) A box shall be used wherever a change is made to a raceway system or a cable system which is metal clad or metal sheathed.

(I) Flexible cords and cables shall be protected from damage. Sharp corners and projections shall be avoided. Flexible cords and cables may pass through doorways or other pinch points, if protection is provided to avoid damage.

(J) Extension cord sets used with portable electric tools and appliances shall be of three-wire type and shall be designed for hard or extra-hard usage. Flexible cords used with temporary and portable lights shall be designed for hard or extra-hard usage.

Note: The National Electrical Code, ANSI/NFPA 70, in Article 400, Table 400-4, lists various types of flexible cords, some of which are noted as being designed for hard or extra-hard usage. Examples of these types of flexible cords include hard

service cord (types S, ST, SO, STO) and junior hard service cord (types SJ, SJO, SJT, SJTO).

(iii) Guarding. For temporary wiring over 750 volts, nominal, fencing, barriers, or other effective means shall be provided to prevent access of other than authorized and qualified personnel.

(2) Cabinets, boxes, and fittings.

(a) Conductors entering boxes, cabinets, or fittings. Conductors entering boxes, cabinets, or fittings shall be protected from abrasion, and openings through which conductors enter shall be effectively closed. Unused openings in cabinets, boxes, and fittings shall also be effectively closed.

(b) Covers and canopies. All pull boxes, junction boxes, and fittings shall be provided with covers. If metal covers are used, they shall be grounded. In energized installations each outlet box shall have a cover, faceplate, or fixture canopy. Covers of outlet boxes having holes through which flexible cord pendants pass shall be provided with bushings designed for the purpose or shall have smooth, well-rounded surfaces on which the cords may bear.

(c) Pull and junction boxes for systems over 750 volts, nominal. In addition to other requirements in this section for pull and junction boxes, the following shall apply to these boxes for systems over 750 volts, nominal:

(i) Complete enclosure. Boxes shall provide a complete enclosure for the contained conductors or cables.

(ii) Covers. Boxes shall be closed by covers securely fastened in place. Underground box covers that weigh over 100 pounds (43.6 kg) meet this requirement. Covers for boxes shall be permanently marked "HIGH VOLTAGE." The marking shall be on the outside of the box cover and shall be readily visible and legible.

(3) Knife switches. Single-throw knife switches shall be so connected that the blades are dead when the switch is in the open position. Single-throw knife switches shall be so placed that gravity will not tend to close them. Single-throw knife switches approved for use in the inverted position shall be provided with a locking device that will ensure that the blades remain in the open position when so set. Double-throw knife switches may be mounted so that the throw will be either vertical or horizontal. However, if the throw is vertical, a locking device shall be provided to ensure that the blades remain in the open position when so set.

(4) Switchboards and panelboards. Switchboards that have any exposed live parts shall be located in permanently dry locations and accessible only to qualified persons. Panelboards shall be mounted in cabinets, cutout boxes, or enclosures designed for the purpose and shall be dead front. However, panelboards other than the dead front externally-operable type are permitted where accessible only to qualified persons. Exposed blades of knife switches shall be dead when open.

(5) Enclosures for damp or wet locations.

(a) Cabinets, fittings, and boxes. Cabinets, cutout boxes, fittings, boxes, and panelboard enclosures in damp or wet locations shall be installed so as to prevent moisture or water from entering and accumulating

within the enclosures. In wet locations the enclosures shall be weatherproof.

(b) Switches and circuit breakers. Switches, circuit breakers, and switchboards installed in wet locations shall be enclosed in weatherproof enclosures.

(6) Conductors for general wiring. All conductors used for general wiring shall be insulated unless otherwise permitted in this part. The conductor insulation shall be of a type that is suitable for the voltage, operating temperature, and location of use. Insulated conductors shall be distinguishable by appropriate color or other means as being grounded conductors, ungrounded conductors, or equipment grounding conductors.

(7) Flexible cords and cables.

(a) Use of flexible cords and cables.

(i) Permitted uses. Flexible cords and cables shall be suitable for conditions of use and location. Flexible cords and cables shall be used only for:

(A) Pendants;

(B) Wiring of fixtures;

(C) Connection of portable lamps or appliances;

(D) Elevator cables;

(E) Wiring of cranes and hoists;

(F) Connection of stationary equipment to facilitate their frequent interchange;

(G) Prevention of the transmission of noise or vibration; or

(H) Appliances where the fastening means and mechanical connections are designed to permit removal for maintenance and repair.

(ii) Attachment plugs for cords. If used as permitted in (a)(i)(C), (F), or (H) of this subsection, the flexible cord shall be equipped with an attachment plug and shall be energized from a receptacle outlet.

(iii) Prohibited uses. Unless necessary for a use permitted in (a)(i) of this subsection, flexible cords and cables shall not be used:

(A) As a substitute for the fixed wiring of a structure;

(B) Where run through holes in walls, ceilings, or floors;

(C) Where run through doorways, windows, or similar openings, except as permitted in subsection (1)(b)(ii)(I) of this section;

(D) Where attached to building surfaces; or

(E) Where concealed behind building walls, ceilings, or floors.

(b) Identification, splices, and terminations.

(i) Identification. A conductor of a flexible cord or cable that is used as a grounded conductor or an equipment grounding conductor shall be distinguishable from other conductors.

(ii) Marking. Type SJ, SJO, SJT, SJTO, S, SO, ST, and STO cords shall not be used unless durably marked on the surface with the type designation, size, and number of conductors.

(iii) Splices. Flexible cords shall be used only in continuous lengths without splice or tap. Hard service flexible cords No. 12 or larger may be repaired if spliced so that the splice retains the insulation, outer sheath properties, and usage characteristics of the cord being spliced.

(iv) Strain relief. Flexible cords shall be connected to devices and fittings so that strain relief is provided which will prevent pull from being directly transmitted to joints or terminal screws.

(v) Cords passing through holes. Flexible cords and cables shall be protected by bushings or fittings where passing through holes in covers, outlet boxes, or similar enclosures.

(vi) Trailing cables shall be protected from damage.

(vii) Cord and cable passing through work areas shall be covered or elevated to protect it from damage which would create a hazard to employees.

(8) Portable cables over 750 volts, nominal. Multiconductor portable cable for use in supplying power to portable or mobile equipment at over 750 volts, nominal, shall consist of No. 8 or larger conductors employing flexible stranding. Cables operated at over 2000 volts shall be shielded for the purpose of confining the voltage stresses to the insulation. Grounding conductors shall be provided. Connectors for these cables shall be of a locking type with provisions to prevent their opening or closing while energized. Strain relief shall be provided at connections and terminations. Portable cables shall not be operated with splices unless the splices are of the permanent molded, vulcanized, or other equivalent type. Termination enclosures shall be marked with a high voltage hazard warning, and terminations shall be accessible only to authorized and qualified personnel.

(9) Fixture wires.

(a) General. Fixture wires shall be suitable for the voltage, temperature, and location of use. A fixture wire which is used as a grounded conductor shall be identified.

(b) Uses permitted. Fixture wires may be used:

(i) For installation in lighting, fixtures and in similar equipment where enclosed or protected and not subject to bending or twisting in use; or

(ii) For connecting lighting fixtures to the branch-circuit conductors supplying the fixtures.

(c) Uses not permitted. Fixture wires shall not be used as branch-circuit conductors except as permitted for Class 1 power-limited circuits.

(10) Equipment for general use.

(a) Lighting fixtures, lampholders, lamps, and receptacles.

(i) Live parts. Fixtures, lampholders, lamps, rosettes, and receptacles shall have no live parts normally exposed to employee contact. However, rosettes and cleat-type lampholders and receptacles located at least 8 feet (2.44 m) above the floor may have exposed parts.

(ii) Support. Fixtures, lampholders, rosettes, and receptacles shall be securely supported. A fixture that weighs more than 6 pounds (2.72 kg) or exceeds 16 inches (406 mm) in any dimension shall not be supported by the screw shell of a lampholder.

(iii) Portable lamps. Portable lamps shall be wired with flexible cord and an attachment plug of the polarized or grounding type. If the portable lamp uses an Edison-based lampholder, the grounded conductor shall

be identified and attached to the screw shell and the identified blade of the attachment plug. In addition, portable handlamps shall comply with the following:

(A) Metal shell, paperlined lampholders shall not be used;

(B) Handlamps shall be equipped with a handle of molded composition or other insulating material;

(C) Handlamps shall be equipped with a substantial guard attached to the lampholder or handle;

(D) Metallic guards shall be grounded by the means of an equipment grounding conductor run within the power supply cord.

(iv) Lampholders. Lampholders of the screw-shell type shall be installed for use as lampholders only. Lampholders installed in wet or damp locations shall be of the weatherproof type.

(v) Fixtures. Fixtures installed in wet or damp locations shall be identified for the purpose and shall be installed so that water cannot enter or accumulate in wireways, lampholders, or other electrical parts.

(b) Receptacles, cord connectors, and attachment plugs (caps).

(i) Configuration. Receptacles, cord connectors, and attachment plugs shall be constructed so that no receptacle or cord connector will accept an attachment plug with a different voltage or current rating than that for which the device is intended. However, a 20-ampere T-slot receptacle or cord connector may accept a 15-ampere attachment plug of the same voltage rating. Receptacles connected to circuits having different voltages, frequencies, or types of current (AC or DC) on the same premises shall be of such design that the attachment plugs used on these circuits are not interchangeable.

(ii) Damp and wet locations. A receptacle installed in a wet or damp location shall be designed for the location.

(c) Appliances.

(i) Live parts. Appliances, other than those in which the current-carrying parts at high temperatures are necessarily exposed, shall have no live parts normally exposed to employee contact.

(ii) Disconnecting means. A means shall be provided to disconnect each appliance.

(iii) Rating. Each appliance shall be marked with its rating in volts and amperes or volts and watts.

(d) Motors. This subdivision applies to motors, motor circuits, and controllers.

(i) In sight from. If specified that one piece of equipment shall be "in sight from" another piece of equipment, one shall be visible and not more than 50 feet (15.2 m) from the other.

(ii) Disconnecting means.

(A) A disconnecting means shall be located in sight from the controller location. The controller disconnecting means for motor branch circuits over 750 volts, nominal, may be out of sight of the controller, if the controller is marked with a warning label giving the location and identification of the disconnecting means which is to be locked in the open position.

(B) The disconnecting means shall disconnect the motor and the controller from all ungrounded supply conductors and shall be so designed that no pole can be operated independently.

(C) If a motor and the driven machinery are not in sight from the controller location, the installation shall comply with one of the following conditions:

(I) The controller disconnecting means shall be capable of being locked in the open position.

(II) A manually operable switch that will disconnect the motor from its source of supply shall be placed in sight from the motor location.

(D) The disconnecting means shall plainly indicate whether it is in the open (off) or closed (on) position.

(E) The disconnecting means shall be readily accessible. If more than one disconnect is provided for the same equipment, only one need be readily accessible.

(F) An individual disconnecting means shall be provided for each motor, but a single disconnecting means may be used for a group of motors under any one of the following conditions:

(I) If a number of motors drive special parts of a single machine or piece of apparatus, such as a metal or woodworking machine, crane, or hoist;

(II) If a group of motors is under the protection of one set of branch-circuit protective devices; or

(III) If a group of motors is in a single room in sight from the location of the disconnecting means.

(iii) Motor overload, short-circuit, and ground-fault protection. Motors, motor-control apparatus, and motor branch-circuit conductors shall be protected against overheating due to motor overloads or failure to start, and against short-circuits or ground faults. These provisions do not require overload protection that will stop a motor where a shutdown is likely to introduce additional or increased hazards, as in the case of fire pumps, or where continued operation of a motor is necessary for a safe shutdown of equipment or process and motor overload sensing devices are connected to a supervised alarm.

(iv) Protection of live parts—all voltages.

(A) Stationary motors having commutators, collectors, and brush rigging located inside of motor end brackets and not conductively connected to supply circuits operating at more than 150 volts to ground need not have such parts guarded. Exposed live parts of motors and controllers operating at 50 volts or more between terminals shall be guarded against accidental contact by any of the following:

(I) By installation in a room or enclosure that is accessible only to qualified persons;

(II) By installation on a balcony, gallery, or platform, so elevated and arranged as to exclude unqualified persons; or

(III) By elevation 8 feet (2.44 m) or more above the floor.

(B) Where live parts of motors or controllers operating at over 150 volts to ground are guarded against accidental contact only by location, and where adjustment or other attendance may be necessary during the operation of the apparatus, insulating mats or platforms shall

be provided so that the attendant cannot readily touch live parts unless standing on the mats or platforms.

(e) Transformers.

(i) Application. The following subsections cover the installation of all transformers, except:

(A) Current transformers;

(B) Dry-type transformers installed as a component part of other apparatus;

(C) Transformers which are an integral part of an x-ray, high frequency, or electrostatic-coating apparatus;

(D) Transformers used with Class 2 and Class 3 circuits, sign and outline lighting, electric discharge lighting, and power-limited fire-protective signaling circuits.

(E) Transformers mounted on utility poles at a height of more than 12 feet from the ground are exempt from the requirements of this subsection.

(ii) Operating voltage. The operating voltage of exposed live parts of transformer installations shall be indicated by warning signs or visible markings on the equipment or structure.

(iii) Transformers over 35 kV. Dry-type, high fire point liquid-insulated, and askarel-insulated transformers installed indoors and rated over 35 kV shall be in a vault.

(iv) Oil-insulated transformers. If they present a fire hazard to employees, oil-insulated transformers installed indoors shall be in a vault.

(v) Fire protection. Combustible material, combustible buildings and parts of buildings, fire escapes, and door and window openings shall be safeguarded from fires which may originate in oil-insulated transformers attached to or adjacent to a building or combustible material.

(vi) Transformer vaults. Transformer vaults shall be constructed so as to contain fire and combustible liquids within the vault and to prevent unauthorized access. Locks and latches shall be so arranged that a vault door can be readily opened from the inside.

(vii) Pipes and ducts. Any pipe or duct system foreign to the vault installation shall not enter or pass through a transformer vault.

(viii) Material storage. Materials shall not be stored in transformer vaults.

(f) Capacitors.

(i) Drainage of stored charge. All capacitors, except surge capacitors or capacitors included as a component part of other apparatus, shall be provided with an automatic means of draining the stored charge and maintaining the discharged state after the capacitor is disconnected from its source of supply.

(ii) Over 750 volts. Capacitors rated over 750 volts, nominal, shall comply with the following additional requirements:

(A) Isolating or disconnecting switches (with no interrupting rating) shall be interlocked with the load interrupting device or shall be provided with prominently displayed caution signs to prevent switching load current.

(B) For series capacitors the proper switching shall be assured by use of at least one of the following:

(I) Mechanically sequenced isolating and bypass switches;

(II) Interlocks; or

(III) Switching procedure prominently displayed at the switching location.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-449, filed 5/11/88.]

WAC 296-155-450 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-155-452 Specific purpose equipment and installations. (1) Cranes and hoists. This subsection applies to the installation of electric equipment and wiring used in connection with cranes, monorail hoists, hoists, and all runways.

(a) Disconnecting means.

(i) Runway conductor disconnecting means. A readily accessible disconnecting means shall be provided between the runway contact conductors and the power supply.

(ii) Disconnecting means for cranes and monorail hoists. A disconnecting means, capable of being locked in the open position, shall be provided in the leads from the runway contact conductors or other power supply on any crane or monorail hoist.

(A) If this additional disconnecting means is not readily accessible from the crane or monorail hoist operating station, means shall be provided at the operating station to open the power circuit to all motors of the crane or monorail hoist.

(B) The additional disconnect may be omitted if a monorail hoist or hand-propelled crane bridge installation meets all of the following:

(I) The unit is floor controlled;

(II) The unit is within view of the power supply disconnecting means; and

(III) No fixed work platform has been provided for servicing the unit.

(b) Control. A limit switch or other device shall be provided to prevent the load block from passing the safe upper limit of travel of any hoisting mechanism.

(c) Clearance. The dimension of the working space in the direction of access to live parts which may require examination, adjustment, servicing, or maintenance while alive shall be a minimum of 2 feet 6 inches (762 mm). Where controls are enclosed in cabinets, the door(s) shall open at least 90 degrees or be removable, or the installation shall provide equivalent access.

(d) Grounding. All exposed metal parts of cranes, monorail hoists, hoists and accessories including pendant controls shall be metallically joined together into a continuous electrical conductor so that the entire crane or hoist will be grounded in accordance with WAC 296-155-434(6). Moving parts, other than removable accessories or attachments, having metal-to-metal bearing surfaces shall be considered to be electrically connected to each other through the bearing surfaces for grounding purposes. The trolley frame and bridge frame shall be considered as electrically grounded through the bridge

and trolley wheels and its respective tracks unless conditions such as paint or other insulating materials prevent reliable metal-to-metal contact. In this case a separate bonding conductor shall be provided.

(2) Elevators, escalators, and moving walks.

(a) Disconnecting means. Elevators, escalators, and moving walks shall have a single means for disconnecting all ungrounded main power supply conductors for each unit.

(b) Control panels. If control panels are not located in the same space as the drive machine, they shall be located in cabinets with doors or panels capable of being locked closed.

(3) Electric welders—disconnecting means.

(a) Motor-generator, AC transformer, and DC rectifier arc welders. A disconnecting means shall be provided in the supply circuit for each motor-generator arc welder, and for each AC transformer and DC rectifier arc welder which is not equipped with a disconnect mounted as an integral part of the welder.

(b) Resistance welders. A switch or circuit breaker shall be provided by which each resistance welder and its control equipment can be isolated from the supply circuit. The ampere rating of this disconnecting means shall not be less than the supply conductor ampacity.

(4) X-ray equipment.

(a) Disconnecting means.

(i) General. A disconnecting means shall be provided in the supply circuit. The disconnecting means shall be operable from a location readily accessible from the x-ray control. For equipment connected to a 120-volt branch circuit of 30 amperes or less, a grounding-type attachment plug cap and receptacle of proper rating may serve as a disconnecting means.

(ii) More than one piece of equipment. If more than one piece of equipment is operated from the same high-voltage circuit, each piece or each group of equipment as a unit shall be provided with a high-voltage switch or equivalent disconnecting means. This disconnecting means shall be constructed, enclosed, or located so as to avoid contact by employees with its live parts.

(b) Control—radiographic and fluoroscopic types. Radiographic and fluoroscopic-type equipment shall be effectively enclosed or shall have interlocks that deenergize the equipment automatically to prevent ready access to live current-carrying parts.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-452, filed 5/11/88.]

WAC 296-155-455 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-155-456 Hazardous (classified) locations.

(1) Scope. This section sets forth requirements for electric equipment and wiring in locations which are classified depending on the properties of the flammable vapors, liquids or gases, or combustible dusts or fibers which may be present therein and the likelihood that a flammable or combustible concentration or quantity is present. Each room, section or area shall be considered

individually in determining its classification. These hazardous (classified) locations are assigned six designations as follows: Class I, Division 1; Class I, Division 2; Class II, Division 1; Class II, Division 2; Class III, Division 1; Class III, Division 2. For definitions of these locations see WAC 296-155-428. All applicable requirements in this part apply to all hazardous (classified) locations, unless modified by provisions of this section.

(a) All components and utilization equipment used in a hazardous location shall be chosen from among those listed by a nationally recognized testing laboratory, such as Underwriters' Laboratories, Inc., or Factory Mutual Engineering Corp., except custom-made components and utilization equipment.

(b) Equipment approved for a specific hazardous location shall not be installed or intermixed with equipment approved for another specific hazardous location.

(2) Electrical installations. Equipment, wiring methods, and installations of equipment in hazardous (classified) locations shall be approved as intrinsically safe or approved for the hazardous (classified) location or safe for the hazardous (classified) location. Requirements for each of these options are as follows:

(a) Intrinsically safe. Equipment and associated wiring approved as intrinsically safe is permitted in any hazardous (classified) location included in its listing or labeling.

(b) Approved for the hazardous (classified) location.

(i) General. Equipment shall be approved not only for the class of location but also for the ignitable or combustible properties of the specific gas, vapor, dust, or fiber that will be present.

Note: NFPA 70, the National Electrical Code, lists or defines hazardous gases, vapors, and dusts by "groups" characterized by their ignitable or combustible properties.

(ii) Marking. Equipment shall not be used unless it is marked to show the class, group, and operating temperature or temperature range, based on operation in a 40°C ambient, for which it is approved. The temperature marking shall not exceed the ignition temperature of the specific gas, vapor, or dust to be encountered. However, the following provisions modify this marking requirement for specific equipment:

(A) Equipment of the nonheat-producing type (such as junction boxes, conduit, and fitting) and equipment of the heat-producing type having a maximum temperature of not more than 100°C (212°F) need not have a marked operating temperature or temperature range.

(B) Fixed lighting fixtures marked for use only in Class I, Division 2 locations need not be marked to indicate the group.

(C) Fixed general-purpose equipment in Class I locations, other than lighting fixtures, which is acceptable for use in Class I, Division 2 locations need not be marked with the class, group, division, or operating temperature.

(D) Fixed dust-tight equipment, other than lighting fixtures, which is acceptable for use in Class II, Division 2 and Class III locations need not be marked with the class, group, division, or operating temperature.

(c) Safe for the hazardous (classified) location. Equipment which is safe for the location shall be of a type and design which the employer demonstrates will provide protection from the hazards arising from the combustibility and flammability of vapors, liquids, gases, dusts, or fibers.

Note: The National Electrical Code, NFPA 70, contains guidelines for determining the type and design of equipment and installations which will meet this requirement. The guidelines of this document address electric wiring, equipment, and systems installed in hazardous (classified) locations and contain specific provisions for the following: Wiring methods, wiring connections, conductor insulation, flexible cords, sealing and drainage, transformers, capacitors, switches, circuit breakers, fuses, motor controllers, receptacles, attachment plugs, meters, relays, instruments, resistors, generators, motors, lighting fixtures, storage battery charging equipment, electric cranes, electric hoists and similar equipment, utilization equipment, signaling systems, alarm systems, remote control systems, local loud speaker and communication systems, ventilation piping, live parts, lightning surge protection, and grounding. Compliance with these guidelines will constitute one means, but not the only means, of compliance with this subsection.

(3) Conduits. All conduits shall be threaded and shall be made wrench-tight. Where it is impractical to make a threaded joint tight, a bonding jumper shall be utilized.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-456, filed 5/11/88.]

WAC 296-155-459 Special systems. (1) Systems over 750 volts, nominal. (a) through (d) of this subsection contain general requirements for all circuits and equipment operated at over 750 volts.

(a) Wiring methods for fixed installations.

(i) Above ground. Above-ground conductors shall be installed in rigid metal conduit, in intermediate metal conduit, in cable trays, in cablebus, in other suitable raceways, or as open runs of metal-clad cable designed for the use and purpose. However, open runs of nonmetallic-sheathed cable or of bare conductors or busbars may be installed in locations which are accessible only to qualified persons. Metallic shielding components, such as tapes, wires, or braids for conductors, shall be grounded. Open runs of insulated wires and cables having a bare lead sheath or a braided outer covering shall be supported in a manner designed to prevent physical damage to the braid or sheath.

(ii) Installations emerging from the ground. Conductors emerging from the ground shall be enclosed in raceways. Raceways installed on poles shall be of rigid metal conduit, intermediate metal conduit, PVC schedule 80 or equivalent extending from the ground line up to a point 8 feet (2.44 m) above finished grade. Conductors entering a building shall be protected by an enclosure from the ground line to the point of entrance. Metallic enclosures shall be grounded.

(b) Interrupting and isolating devices.

(i) Circuit breakers. Circuit breakers located indoors shall consist of metal-enclosed or fire-resistant, cell-mounted units. In locations accessible only to qualified personnel, open mounting of circuit breakers is permitted. A means of indicating the open and closed position of circuit breakers shall be provided.

(ii) Fused cutouts. Fused cutouts installed in buildings or transformer vaults shall be of a type identified for the purpose. They shall be readily accessible for fuse replacement.

(iii) Equipment isolating means. A means shall be provided to completely isolate equipment for inspection and repairs. Isolating means which are not designed to interrupt the load current of the circuit shall be either interlocked with a circuit interrupter or provided with a sign warning against opening them under load.

(c) Mobile and portable equipment.

(i) Power cable connections to mobile machines. A metallic enclosure shall be provided on the mobile machine for enclosing the terminals of the power cable. The enclosure shall include provisions for a solid connection for the ground wire(s) terminal to ground effectively the machine frame. The method of cable termination used shall prevent any strain or pull on the cable from stressing the electrical connections. The enclosure shall have provision for locking so only authorized qualified persons may open it and shall be marked with a sign warning of the presence of energized parts.

(ii) Guarding live parts. All energized switching and control parts shall be enclosed in effectively grounded metal cabinets or enclosures. Circuit breakers and protective equipment shall have the operating means projecting through the metal cabinet or enclosure so these units can be reset without locked doors being opened. Enclosures and metal cabinets shall be locked so that only authorized qualified persons have access and shall be marked with a sign warning of the presence of energized parts. Collector ring assemblies on revolving-type machines (shovels, draglines, etc.) shall be guarded.

(d) Tunnel installations.

(i) Application. The provisions of this item apply to installation and use of high-voltage power distribution and utilization equipment which is associated with tunnels and which is portable and/or mobile, such as substations, trailers, cars, mobile shovels, draglines, hoists, drills, dredges, compressors, pumps, conveyors, and underground excavators.

(ii) Conductors. Conductors in tunnels shall be installed in one or more of the following:

(A) Metal conduit or other metal raceway;

(B) Type MC cable; or

(C) Other suitable multiconductor cable.

Conductors shall also be so located or guarded as to protect them from physical damage. Multiconductor portable cable may supply mobile equipment. An equipment grounding conductor shall be run with circuit conductors inside the metal raceway or inside the multiconductor cable jacket. The equipment grounding conductor may be insulated or bare.

(iii) Guarding live parts. Bare terminals of transformers, switches, motor controllers, and other equipment shall be enclosed to prevent accidental contact with energized parts. Enclosures for use in tunnels shall be drip-proof, weatherproof, or submersible as required by the environmental conditions.

(iv) Disconnecting means. A disconnecting means that simultaneously opens all ungrounded conductors shall be installed at each transformer or motor location.

(v) Grounding and bonding. All nonenergized metal parts of electric equipment and metal raceways and cable sheaths shall be grounded and bonded to all metal pipes and rails at the portal and at intervals not exceeding 1000 feet (305 m) throughout the tunnel.

(2) Class 1, Class 2, and Class 3 remote control, signaling, and power-limited circuits.

(a) Classification. Class 1, Class 2, or Class 3 remote control, signaling, or power-limited circuits are characterized by their usage and electrical power limitation which differentiates them from light and power circuits. These circuits are classified in accordance with their respective voltage and power limitations as summarized in (a)(i) through (iii) of this subsection.

(i) Class 1 circuits.

(A) A Class 1 power-limited circuit is supplied from a source having a rated output of not more than 30 volts and 1000 volt-amperes.

(B) A Class 1 remote control circuit or a Class 1 signaling circuit has a voltage which does not exceed 750 volts; however, the power output of the source need not be limited.

(ii) Class 2 and Class 3 circuits.

(A) Power for Class 2 and Class 3 circuits is limited either inherently (in which no overcurrent protection is required) or by a combination of a power source and overcurrent protection.

(B) The maximum circuit voltage is 150 volts AC or DC for a Class 2 inherently limited power source, and 100 volts AC or DC for a Class 3 inherently limited power source.

(C) The maximum circuit voltage is 30 volts AC and 60 volts DC for a Class 2 power source limited by overcurrent protection, and 150 volts AC or DC for a Class 3 power source limited by overcurrent protection.

(iii) Application. The maximum circuit voltages in (a)(i) and (ii) of this subsection apply to sinusoidal AC or continuous DC power sources, and where wet contact occurrence is not likely.

(b) Marking. A Class 2 or Class 3 power supply unit shall not be used unless it is durably marked where plainly visible to indicate the class of supply and its electrical rating.

(3) Communications systems.

(a) Scope. These provisions for communication systems apply to such systems as central-station-connected and noncentral-station-connected telephone circuits, radio receiving and transmitting equipment, and outside wiring for fire and burglar alarm, and similar central station systems. These installations need not comply with the provisions of WAC 296-155-444 through 296-155-459(2), except WAC 296-155-447 (3)(a)(ii) and 296-155-456.

(b) Protective devices.

(i) Circuits exposed to power conductors. Communication circuits so located as to be exposed to accidental contact with light or power conductors operating at over

300 volts shall have each circuit so exposed provided with an approved protector.

(ii) Antenna lead-ins. Each conductor of a lead-in from an outdoor antenna shall be provided with an antenna discharge unit or other means that will drain static charges from the antenna system.

(c) Conductor location.

(i) Outside of buildings.

(A) Receiving distribution lead-in or aerial-drop cables attached to buildings and lead-in conductors to radio transmitters shall be so installed as to avoid the possibility of accidental contact with electric light or power conductors.

(B) The clearance between lead-in conductors and any lightning protection conductors shall not be less than 6 feet (1.83 m).

(ii) On poles. Where practicable, communication conductors on poles shall be located below the light or power conductors. Communications conductors shall not be attached to a crossarm that carries light or power conductors.

(iii) Inside of buildings. Indoor antennas, lead-ins, and other communication conductors attached as open conductors to the inside of buildings shall be located at least 2 inches (50.8 mm) from conductors of any light or power or Class 1 circuits unless a special and equally protective method of conductor separation is employed.

(d) Equipment location. Outdoor metal structures supporting antennas, as well as self-supporting antennas such as vertical rods or dipole structures, shall be located as far away from overhead conductors of electric light and power circuits of over 150 volts to ground as necessary to avoid the possibility of the antenna or structure falling into or making accidental contact with such circuits.

(e) Grounding.

(i) Lead-in conductors. If exposed to contact with electric light or power conductors, the metal sheath of aerial cables entering buildings shall be grounded or shall be interrupted close to the entrance to the building by an insulating joint or equivalent device. Where protective devices are used, they shall be grounded.

(ii) Antenna structures. Masts and metal structures supporting antennas shall be permanently and effectively grounded without splice or connection in the grounding conductor.

(iii) Equipment enclosures. Transmitters shall be enclosed in a metal frame or grill or separated from the operating space by a barrier, all metallic parts of which are effectively connected to ground. All external metal handles and controls accessible to the operating personnel shall be effectively grounded. Unpowered equipment and enclosures shall be considered grounded where connected to an attached coaxial cable with an effectively grounded metallic shield.

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-459, filed 5/11/88.]

WAC 296-155-462 Definitions applicable to this part. The definitions given in this section apply to the

terms used in Part I. The definitions given here for "approved" and "qualified person" apply, instead of the definitions given in WAC 296-155-012, to the use of these terms in Part I.

(1) "Acceptable." An installation or equipment is acceptable to the director, and approved within the meaning of this Part I:

(a) If it is accepted, certified, listed, labeled, or otherwise determined to be safe by a qualified testing laboratory capable of determining the suitability of materials and equipment for installation and use in accordance with this standard; or

(b) With respect to an installation or equipment of a kind which no qualified testing laboratory accepts, certifies, lists, labels, or determines to be safe, if it is inspected or tested by another state agency, or by a federal, municipal, or other local authority responsible for enforcing occupational safety provisions of the National Electrical Code, and found in compliance with those provisions; or

(c) With respect to custom-made equipment or related installations which are designed, fabricated for, and intended for use by a particular customer, if it is determined to be safe for its intended use by its manufacturer on the basis of test data which the employer keeps and makes available for inspection to the director and his authorized representatives.

(2) "Accepted." An installation is "accepted" if it has been inspected and found to be safe by a qualified testing laboratory.

(3) "Accessible." (As applied to wiring methods.) Capable of being removed or exposed without damaging the building structure or finish, or not permanently closed in by the structure or finish of the building. (See "concealed" and "exposed.")

(4) "Accessible." (As applied to equipment.) Admitting close approach; not guarded by locked doors, elevation, or other effective means. (See "readily accessible.")

(5) "Ampacity." The current in amperes a conductor can carry continuously under the conditions of use without exceeding its temperature rating.

(6) "Appliances." Utilization equipment, generally other than industrial, normally built in standardized sizes or types, which is installed or connected as a unit to perform one or more functions.

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

(8) "Askarel." A generic term for a group of non-flammable synthetic chlorinated hydrocarbons used as electrical insulating media. Askarels of various compositional types are used. Under arcing conditions the gases produced, while consisting predominantly of noncombustible hydrogen chloride, can include varying amounts of combustible gases depending upon the askarel type.

(9) "Attachment plug (plug cap) (cap)." A device which, by insertion in a receptacle, establishes connection between the conductors of the attached flexible cord and the conductors connected permanently to the receptacle.

(10) "Automatic." Self-acting, operating by its own mechanism when actuated by some impersonal influence, as for example, a change in current strength, pressure, temperature, or mechanical configuration.

(11) "Bare conductor." See "conductor."

(12) "Bonding." The permanent joining of metallic parts to form an electrically conductive path which will assure electrical continuity and the capacity to conduct safely any current likely to be imposed.

(13) "Bonding jumper." A reliable conductor to assure the required electrical conductivity between metal parts required to be electrically connected.

(14) "Branch circuits." That portion of a wiring system extending beyond the final overcurrent device protecting the circuit. (A device not approved for branch circuit protection, such as thermal cutout or motor overload protective device, is not considered as the overcurrent device protecting the circuit.)

(15) "Building." A structure which stands alone or which is cut off from adjoining structures by fire walls with all openings therein protected by approved fire doors.

(16) "Cabinet." An enclosure designed either for surface or flush mounting, and provided with a frame, mat, or trim in which a swinging door or doors are or may be hung.

(17) "Certified." Equipment is "certified" if it:

(a) Has been tested and found by a qualified testing laboratory to meet applicable test standards or to be safe for use in a specified manner; and

(b) Is of a kind whose production is periodically inspected by a qualified testing laboratory. Certified equipment must bear a label, tag, or other record of certification.

(18) "Circuit breaker."

(a) (750 volts nominal, or less.) A device designed to open and close a circuit by nonautomatic means and to open the circuit automatically on a predetermined overcurrent without injury to itself when properly applied within its rating.

(b) (Over 750 volts, nominal.) A switching device capable of making, carrying, and breaking currents under normal circuit conditions, and also making, carrying for a specified time, and breaking currents under specified abnormal circuit conditions, such as those of short circuit.

(19) "Class I locations." Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures. Class I locations include the following:

(a) Class I, Division 1. A Class I, Division 1 location is a location:

(i) In which ignitable concentrations of flammable gases or vapors may exist under normal operating conditions; or

(ii) In which ignitable concentrations of such gases or vapors may exist frequently because of repair or maintenance operations or because of leakage; or

(iii) In which breakdown or faulty operation of equipment or processes might release ignitable concentrations of flammable gases or vapors, and might also cause simultaneous failure of electric equipment.

Note: This classification usually includes locations where volatile flammable liquids or liquefied flammable gases are transferred from one container to another; interiors of spray booths and areas in the vicinity of spraying and painting operations where volatile flammable solvents are used; locations containing open tanks or vats of volatile flammable liquids; drying rooms or compartments for the evaporation of flammable solvents; inadequately ventilated pump rooms for flammable gas or for volatile flammable liquids; and all other locations where ignitable concentrations of flammable vapors or gases are likely to occur in the course of normal operations.

(b) Class I, Division 2. A Class I, Division 2 location is a location:

(i) In which volatile flammable liquids or flammable gases are handled, processed, or used, but in which the hazardous liquids, vapors, or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems, or in case of abnormal operation of equipment; or

(ii) In which ignitable concentrations of gases or vapors are normally prevented by positive mechanical ventilation, and which might become hazardous through failure or abnormal operations of the ventilating equipment; or

(iii) That is adjacent to a Class I, Division 1 location, and to which ignitable concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clean air, and effective safeguards against ventilation failure are provided.

Note: This classification usually includes locations where volatile flammable liquids or flammable gases or vapors are used, but which would become hazardous only in case of an accident or of some unusual operating condition. The quantity of flammable material that might escape in case of accident, the adequacy of ventilating equipment, the total area involved, and the record of the industry or business with respect to explosions or fires are all factors that merit consideration in determining the classification and extent of each location.

Piping without valves, checks, meters, and similar devices would not ordinarily introduce a hazardous condition even though used for flammable liquids or gases. Locations used for the storage of flammable liquids or of liquefied or compressed gases in sealed containers would not normally be considered hazardous unless also subject to other hazardous conditions.

Electrical conduits and their associated enclosures separated from process fluids by a single seal or barrier are classed as a Division 2 location if the outside of the conduit and enclosures is a nonhazardous location.

(20) "Class II locations." Class II locations are those that are hazardous because of the presence of combustible dust. Class II locations include the following:

(a) Class II, Division 1. A Class II, Division 1 location is a location:

(i) In which combustible dust is or may be in suspension in the air under normal operating conditions, in quantities sufficient to produce explosive or ignitable mixtures; or

(ii) Where mechanical failure or abnormal operation of machinery or equipment might cause such explosive or ignitable mixtures to be produced, and might also provide a source of ignition through simultaneous failure of electric equipment, operation of protection devices, or from other causes; or

(iii) In which combustible dusts of an electrically conductive nature may be present.

Note: Combustible dusts which are electrically nonconductive include dusts produced in the handling and processing of grain and grain products, pulverized sugar and cocoa, dried egg and milk powders, pulverized spices, starch and pastes, potato and woodflour, oil meal from beans and seed, dried hay, and other organic materials which may produce combustible dusts when processed or handled. Dusts containing magnesium or aluminum are particularly hazardous and the use of extreme caution is necessary to avoid ignition and explosion.

(b) Class II, Division 2. A Class II, Division 2 location is a location in which:

(i) Combustible dust will not normally be in suspension in the air in quantities sufficient to produce explosive or ignitable mixtures, and dust accumulations are normally insufficient to interfere with the normal operation of electrical equipment or other apparatus; or

(ii) Dust may be in suspension in the air as a result of infrequent malfunctioning of handling or processing equipment, and dust accumulations resulting therefrom may be ignitable by abnormal operation or failure of electrical equipment or other apparatus.

Note: This classification includes locations where dangerous concentrations of suspended dust would not be likely but where dust accumulations might form on or in the vicinity of electric equipment. These areas may contain equipment from which appreciable quantities of dust would escape under abnormal operating conditions or be adjacent to a Class II, Division 1 location, as described above, into which an explosive or ignitable concentration of dust may be put into suspension under abnormal operating conditions.

(21) "Class III locations." Class III locations are those that are hazardous because of the presence of easily ignitable fibers or flyings but in which such fibers or flyings are not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures. Class III locations include the following:

(a) Class III, Division 1. A Class III, Division 1 location is a location in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.

Note: Easily ignitable fibers and flyings include rayon, cotton (including cotton linters and cotton waste), sisal or henequen, istle, jute, hemp, tow, cocoa fiber, oakum, baled waste kapok, Spanish moss, excelsior, sawdust, woodchips, and other material of similar nature.

(b) Class III, Division 2. A Class III, Division 2 location is a location in which easily ignitable fibers are stored or handled, except in process of manufacture. Collector ring. A collector ring is an assembly of slip rings for transferring electrical energy from a stationary to a rotating member.

(22) "Collector ring." A collector ring is an assembly of slip rings for transferring electrical energy from a stationary to a rotating member.

(23) "Concealed." Rendered inaccessible by the structure or finish of the building. Wires in concealed raceways are considered concealed, even though they may become accessible by withdrawing them. See "accessible. (As applied to wiring methods.)"

(24) "Conductor."

(a) Bare. A conductor having no covering or electrical insulation whatsoever.

(b) Covered. A conductor encased within material of composition or thickness that is not recognized as electrical insulation.

(c) Insulated. A conductor encased within material of composition and thickness that is recognized as electrical insulation.

(25) "Controller." A device or group of devices that serves to govern, in some predetermined manner, the electric power delivered to the apparatus to which it is connected.

(26) "Covered conductor." See "conductor."

(27) "Cutout." (Over 750 volts, nominal.) An assembly of a fuse support with either a fuseholder, fuse carrier, or disconnecting blade. The fuseholder or fuse carrier may include a conducting element (fuse link), or may act as the disconnecting blade by the inclusion of a nonfusible member.

(28) "Cutout box." An enclosure designed for surface mounting and having swinging doors or covers secured directly to and telescoping with the walls of the box proper. (See "cabinet.")

(29) "Damp location." See "location."

(30) "Dead front." Without live parts exposed to a person on the operating side of the equipment.

(31) "Device." A unit of an electrical system which is intended to carry but not utilize electric energy.

(32) "Disconnecting means." A device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.

(33) "Disconnecting (or isolating) switch." (Over 750 volts, nominal.) A mechanical switching device used for isolating a circuit or equipment from a source of power.

(34) "Dry location." See "location."

(35) "Enclosed." Surrounded by a case, housing, fence or walls which will prevent persons from accidentally contacting energized parts.

(36) "Enclosure." The case or housing of apparatus, or the fence or walls surrounding an installation to prevent personnel from accidentally contacting energized parts, or to protect the equipment from physical damage.

(37) "Equipment." A general term including material, fittings, devices, appliances, fixtures, apparatus, and the like, used as a part of, or in connection with, an electrical installation.

(38) "Equipment grounding conductor." See "grounding conductor, equipment."

(39) "Explosion-proof apparatus." Apparatus enclosed in a case that is capable of withstanding an explosion of a specified gas or vapor which may occur within it and of preventing the ignition of a specified gas

or vapor surrounding the enclosure by sparks, flashes, or explosion of the gas or vapor within, and which operates at such an external temperature that it will not ignite a surrounding flammable atmosphere.

(40) "Exposed. (As applied to live parts.)" Capable of being inadvertently touched or approached nearer than a safe distance by a person. It is applied to parts not suitably guarded, isolated, or insulated. (See "accessible" and "concealed.")

(41) "Exposed. (As applied to wiring methods.)" On or attached to the surface or behind panels designed to allow access. See "accessible. (As applied to wiring methods.)"

(42) "Exposed. (For the purposes of WAC 296-155-459(4), Communications systems.)" Where the circuit is in such a position that in case of failure of supports or insulation, contact with another circuit may result.

(43) "Externally operable." Capable of being operated without exposing the operator to contact with live parts.

(44) "Feeder." All circuit conductors between the service equipment, or the generator switchboard of an isolated plant, and the final branch-circuit overcurrent device.

(45) "Festoon lighting." A string of outdoor lights suspended between two points more than 15 feet (4.57 m) apart.

(46) "Fitting." An accessory such as a locknut, bushing, or other part of a wiring system that is intended primarily to perform a mechanical rather than an electrical function.

(47) "Fuse." (Over 750 volts, nominal.) An overcurrent protective device with a circuit opening fusible part that is heated and severed by the passage of overcurrent through it. A fuse comprises all the parts that form a unit capable of performing the prescribed functions. It may or may not be the complete device necessary to connect it into an electrical circuit.

(48) "Ground." A conducting connection, whether intentional or accidental, between an electrical circuit or equipment and the earth, or to some conducting body that serves in place of the earth.

(49) "Grounded." Connected to earth or to some conducting body that serves in place of the earth.

(50) "Grounded, effectively." (Over 750 volts, nominal.) Permanently connected to earth through a ground connection of sufficiently low impedance and having sufficient ampacity that ground fault current which may occur cannot build up to voltages dangerous to personnel.

(51) "Grounded conductor." A system or circuit conductor that is intentionally grounded.

(52) "Grounding conductor." A conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes.

(53) "Grounding conductor, equipment." The conductor used to connect the noncurrent-carrying metal parts of equipment, raceways, and other enclosures to the system grounded conductor and/or the grounding electrode conductor at the service equipment or at the source of a separately derived system.

(54) "Grounding electrode conductor." The conductor used to connect the grounding electrode to the equipment grounding conductor and/or to the grounded conductor of the circuit at the service equipment or at the source of a separately derived system.

(55) "Ground-fault circuit interrupter." A device for the protection of personnel that functions to deenergize a circuit or portion thereof within an established period of time when a current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit.

(56) "Guarded." Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, or platforms to remove the likelihood of approach to a point of danger or contact by persons or objects.

(57) "Hazard." That condition, potential or inherent, which is likely to cause injury, death, or occupational disease.

(58) "Hoistway." Any shaftway, hatchway, well hole, or other vertical opening or space in which an elevator or dumbwaiter is designed to operate.

(59) "Identified (conductors or terminals)." Identified, as used in reference to a conductor or its terminal, means that such conductor or terminal can be recognized as grounded.

(60) "Identified (for the use)." Recognized as suitable for the specific purpose, function, use, environment, application, etc., where described as a requirement in this standard. Suitability of equipment for a specific purpose, environment, or application is determined by a qualified testing laboratory where such identification includes labeling or listing.

(61) "Insulated conductor." See "conductor."

(62) "Interrupter switch." (Over 750 volts, nominal.) A switch capable of making, carrying, and interrupting specified currents.

(63) "Intrinsically safe equipment and associated wiring." Equipment and associated wiring in which any spark or thermal effect, produced either normally or in specified fault conditions, is incapable, under certain prescribed test conditions, of causing ignition of a mixture of flammable or combustible material in air in its most easily ignitable concentration.

(64) "Isolated." Not readily accessible to persons unless special means for access are used.

(65) "Isolated power system." A system comprising an isolating transformer or its equivalent, a line isolation monitor, and its ungrounded circuit conductors.

(66) "J-Box (junction box)." An electrical sheet metal enclosure with openings for conduit or cable with sheet metal cover. The primary purpose is for joining conductors for splicing.

(67) "Labeled." Equipment or materials to which has been attached a label, symbol or other identifying mark of a qualified testing laboratory which indicates compliance with appropriate standards or performance in a specified manner.

(68) "Lighting outlet." An outlet intended for the direct connection of a lampholder, a lighting fixture, or a pendant cord terminating in a lampholder.

(69) "Listed." Equipment or materials included in a list published by a qualified testing laboratory whose listing states either that the equipment or material meets appropriate standards or has been tested and found suitable for use in a specified manner.

(70) "Location."

(a) Damp location. Partially protected locations under canopies, marquees, roofed open porches, and like locations, and interior locations subject to moderate degrees of moisture, such as some basements.

(b) Dry location. A location not normally subject to dampness or wetness. A location classified as dry may be temporarily subject to dampness or wetness, as in the case of a building under construction.

(c) Wet location. Installations underground or in concrete slabs or masonry in direct contact with the earth, and locations subject to saturation with water or other liquids, such as locations exposed to weather and unprotected.

(71) "Mobile x-ray." X-ray equipment mounted on a permanent base with wheels and/or casters for moving while completely assembled.

(72) "Motor control center." An assembly of one or more enclosed sections having a common power bus and principally containing motor control units.

(73) "Outlet." A point on the wiring system at which current is taken to supply utilization equipment.

(74) "Overcurrent." Any current in excess of the rated current of equipment or the ampacity of a conductor. It may result from overload (see definition), short circuit, or ground fault. A current in excess of rating may be accommodated by certain equipment and conductors for a given set of conditions. Hence the rules for overcurrent protection are specific for particular situations.

(75) "Overload." Operation of equipment in excess of normal, full load rating, or of a conductor in excess of rated ampacity which, when it persists for a sufficient length of time, would cause damage or dangerous overheating. A fault, such as a short circuit or ground fault, is not an overload. (See "overcurrent.")

(76) "Panelboard." A single panel or group of panel units designed for assembly in the form of a single panel; including buses, automatic overcurrent devices, and with or without switches for the control of light, heat, or power circuits; designed to be placed in a cabinet or cutout box placed in or against a wall or partition and accessible only from the front. (See "switchboard.")

(77) "Portable x-ray." X-ray equipment designed to be hand-carried.

(78) "Power fuse." (Over 750 volts, nominal.) See "fuse."

(79) "Power outlet." An enclosed assembly which may include receptacles, circuit breakers, fuseholders, fused switches, buses and watt-hour meter mounting means; intended to serve as a means for distributing power required to operate mobile or temporarily installed equipment.

(80) "Premises wiring system." That interior and exterior wiring, including power, lighting, control, and signal circuit wiring together with all of its associated

hardware, fittings, and wiring devices, both permanently and temporarily installed, which extends from the load end of the service drop, or load end of the service lateral conductors to the outlet(s). Such wiring does not include wiring internal to appliances, fixtures, motors, controllers, motor control centers, and similar equipment.

(81) "Qualified person." One familiar with the construction and operation of the equipment and the hazards involved.

(82) "Qualified testing laboratory." A properly equipped and staffed testing laboratory which has capabilities for and which provides the following services:

(a) Experimental testing for safety of specified items of equipment and materials referred to in this standard to determine compliance with appropriate test standards or performance in a specified manner;

(b) Inspecting the run of such items of equipment and materials at factories for product evaluation to assure compliance with the test standards;

(c) Service-value determinations through field inspections to monitor the proper use of labels on products and with authority for recall of the label in the event a hazardous product is installed;

(d) Employing a controlled procedure for identifying the listed and/or labeled equipment or materials tested; and

(e) Rendering creditable reports or findings that are objective and without bias of the tests and test methods employed.

(83) "Raceway." A channel designed expressly for holding wires, cables, or busbars, with additional functions as permitted in this part. Raceways may be of metal or insulating material, and the term includes rigid metal conduit, rigid nonmetallic conduit, intermediate metal conduit, liquidtight flexible metal conduit, flexible metallic tubing, flexible metal conduit, electrical metallic tubing, underfloor raceways, cellular concrete floor raceways, cellular metal floor raceways, surface raceways, wireways, and busways.

(84) "Readily accessible." Capable of being reached quickly for operation, renewal, or inspections, without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, chairs, etc. (See "accessible.")

(85) "Receptacle." A receptacle is a contact device installed at the outlet for the connection of a single attachment plug. A single receptacle is a single contact device with no other contact device on the same yoke. A multiple receptacle is a single device containing two or more receptacles.

(86) "Receptacle outlet." An outlet where one or more receptacles are installed.

(87) "Remote-control circuit." Any electric circuit that controls any other circuit through a relay or an equivalent device.

(88) "Sealable equipment." Equipment enclosed in a case or cabinet that is provided with a means of sealing or locking so that live parts cannot be made accessible without opening the enclosure. The equipment may or may not be operable without opening the enclosure.

(89) "Separately derived system." A premises wiring system whose power is derived from generator, transformer, or converter windings and has no direct electrical connection, including a solidly connected grounded circuit conductor, to supply conductors originating in another system.

(90) "Service." The conductors and equipment for delivering energy from the electricity supply system to the wiring system of the premises served.

(91) "Service conductors." The supply conductors that extend from the street main or from transformers to the service equipment of the premises supplied.

(92) "Service drop." The overhead service conductors from the last pole or other aerial support to and including the splices, if any, connecting to the service-entrance conductors at the building or other structure.

(93) "Service-entrance conductors, overhead system." The service conductors between the terminals of the service equipment and a point usually outside the building, clear of building walls, where joined by tap or splice to the service drop.

(94) "Service-entrance conductors, underground system." The service conductors between the terminals of the service equipment and the point of connection to the service lateral. Where service equipment is located outside the building walls, there may be no service-entrance conductors, or they may be entirely outside the building.

(95) "Service equipment." The necessary equipment, usually consisting of a circuit breaker or switch and fuses, and their accessories, located near the point of entrance of supply conductors to a building or other structure, or an otherwise defined area, and intended to constitute the main control and means of cutoff of the supply.

(96) "Service raceway." The raceway that encloses the service-entrance conductors.

(97) "Shock hazard." To exist at an accessible part in a circuit between the part and ground, or other accessible parts if the potential is more than 42.4 volts peak and the current through a 1,500-ohm load is more than 5 milliamperes.

(98) "Signaling circuit." Any electric circuit that energizes signaling equipment.

(99) "Switchboard." A large single panel, frame, or assembly of panels which have switches, buses, instruments, overcurrent and other protective devices mounted on the face or back or both. Switchboards are generally accessible from the rear as well as from the front and are not intended to be installed in cabinets. (See "panelboard.")

(100) "Switches."

(a) General-use switch. A switch intended for use in general distribution and branch circuits. It is rated in amperes, and it is capable of interrupting its rated current at its rated voltage.

(b) General-use snap switch. A form of general-use switch so constructed that it can be installed in flush device boxes or on outlet box covers, or otherwise used in conjunction with wiring systems recognized by this part.

(c) Isolating switch. A switch intended for isolating an electric circuit from the source of power. It has no interrupting rating, and it is intended to be operated only after the circuit has been opened by some other means.

(d) Motor-circuit switch. A switch, rated in horsepower, capable of interrupting the maximum operating overload current of a motor of the same horsepower rating as the switch at the rated voltage.

(101) "Switching devices." (Over 750 volts, nominal.) Devices designed to close and/or open one or more electric circuits. Included in this category are circuit breakers, cutouts, disconnecting (or isolating) switches, disconnecting means, and interrupter switches.

(102) "Transformer." A transformer is an apparatus for converting electrical power in an a-c system at one voltage or current into electrical power at some other voltage or current without the use of rotating parts.

(103) "Transportable x-ray." X-ray equipment installed in a vehicle or that may readily be disassembled for transport in a vehicle.

(104) "Utilization equipment." Utilization equipment means equipment which utilizes electric energy for mechanical, chemical, heating, lighting, or similar useful purpose.

(105) "Utilization system." A utilization system is a system which provides electric power and light for employee workplaces, and includes the premises wiring system and utilization equipment.

(106) "Ventilated." Provided with a means to permit circulation of air sufficient to remove an excess of heat, fumes, or vapors.

(107) "Volatile flammable liquid." A flammable liquid having a flash point below 38°C (100°F) or whose temperature is above its flash point, or a Class II combustible liquid having a vapor pressure not exceeding 40 psia (276 kPa) at 38°C (100°F) whose temperature is above its flash point.

(108) "Voltage." (Of a circuit.) The greatest root-mean-square (effective) difference of potential between any two conductors of the circuit concerned.

(109) "Voltage, nominal." A nominal value assigned to a circuit or system for the purpose of conveniently designating its voltage class (as 120/240, 480Y/277, 750, etc.). The actual voltage at which a circuit operates can vary from the nominal within a range that permits satisfactory operation of equipment.

(110) "Voltage to ground." For grounded circuits, the voltage between the given conductor and that point or conductor of the circuit that is grounded; for ungrounded circuits, the greatest voltage between the given conductor and any other conductor of the circuit.

(111) "Watertight." So constructed that moisture will not enter the enclosure.

(112) "Weatherproof." So constructed or protected that exposure to the weather will not interfere with successful operation. Rainproof, raintight, or watertight equipment can fulfill the requirements for weatherproof where varying weather conditions other than wetness, such as snow, ice, dust, or temperature extremes, are not a factor.

(113) "Wet location." See "location."

[Statutory Authority: Chapter 49.17 RCW. 88-11-021 (Order 88-04), § 296-155-462, filed 5/11/88.]

Part Q

TUNNELS AND SHAFTS, CAISSONS, COFFERDAMS, AND COMPRESSED AIR

WAC

296-155-745 Compressed air.

WAC 296-155-745 Compressed air. (1) General provisions.

(a) There shall be present, at all times, at least one competent person designated by and representing the employer, who shall be familiar with this part in all respects and responsible for full compliance with these and other applicable parts.

(b) Every employee shall be instructed in the rules and regulations which concern his safety or the safety of others.

(2) Medical attendance, examination, and regulations.

(a) There shall be retained one or more licensed physicians familiar with and experienced in the physical requirements and the medical aspects of compressed air work and the treatment of decompression illness. He shall be available at all times while work is in progress in order to provide medical supervision of employees employed in compressed air work. He shall himself be physically qualified and be willing to enter a pressurized environment.

(b) No employee shall be permitted to enter a compressed air environment until he has been examined by the physician and reported by him to be physically qualified to engage in such work.

(c) In the event an employee is absent from work for 10 days, or is absent due to sickness or injury, he shall not resume work until he is reexamined by the physician, and his physical condition reported, as provided in this subsection, to be such as to permit him to work in compressed air.

(d) After an employee has been employed continuously in compressed air for a period designated by the physician, but not to exceed 1 year, he shall be reexamined by the physician to determine if he is still physically qualified to engage in compressed air work.

(e) Such physician shall at all times keep a complete and full record of examinations made by him. The physician shall also keep an accurate record of any decompression illness or other illness or injury incapacitating any employee for work, and of all loss of life that occurs in the operation of a tunnel, caisson, or other compartment in which compressed air is used.

(f) Records shall be available for the inspection by the director or his representatives, and a copy thereof shall be forwarded to the division within 48 hours following the occurrence of the accident, death, injury, or decompression illness. It shall state as fully as possible the cause of said death or decompression illness, and the place where the injured or sick employee was taken, and such other relative information as may be required by the director.

(g) A fully equipped first-aid station shall be provided at each tunnel project regardless of the number of persons employed. An ambulance or transportation suitable for a litter case shall be at each project.

(h) Where tunnels are being excavated from portals more than 5 road miles apart, a first-aid station and transportation facilities shall be provided at each portal.

(i) A medical lock shall be established and maintained in immediate working order whenever air pressure in the working chamber is increased above the normal atmosphere.

(j) The medical lock shall:

(i) Have at least 6 feet of clear headroom at the center, and be subdivided into not less than two compartments;

(ii) Be readily accessible to employees working under compressed air;

(iii) Be kept ready for immediate use for at least 5 hours subsequent to the emergence of any employee from the working chamber;

(iv) Be properly heated, lighted and ventilated;

(v) Be maintained in a sanitary condition;

(vi) Have a nonshatterable port through which the occupant(s) may be kept under constant observation;

(vii) Be designed for a working pressure of 75 p.s.i.g.;

(viii) Be equipped with internal controls which may be overridden by external controls;

(ix) Be provided with air pressure gauges to show the air pressure within each compartment to observers inside and outside the medical lock;

(x) Be equipped with a manual type sprinkler system that can be activated inside the lock or by the outside lock tender;

(xi) Be provided with oxygen lines and fittings leading into external tanks. The lines shall be fitted with check valves to prevent reverse flow. The oxygen system inside the chamber shall be of a closed circuit design and be so designed as to automatically shut off the oxygen supply whenever the fire system is activated.

(xii) Be in constant charge of an attendant under the direct control of the retained physician. The attendant shall be trained in the use of the lock and suitably instructed regarding steps to be taken in the treatment of employee exhibiting symptoms compatible with a diagnosis of decompression illness;

(xiii) Be adjacent to an adequate emergency medical facility;

(xiv) The medical facility shall be equipped with demand-type oxygen inhalation equipment approved by the U.S. Bureau of Mines;

(xv) Be capable of being maintained at a temperature, in use, not to exceed 90°F. nor be less than 70°F.; and

(xvi) Be provided with sources of air, free of oil and carbon monoxide, for normal and emergency use, which are capable of raising the air pressure in the lock from 0 to 75 p.s.i.g. in 5 minutes.

(k) Identification badges shall be furnished to all employees, indicating that the wearer is a compressed air worker. A permanent record shall be kept of all identification badges issued. The badge shall give the

employee's name, address of the medical lock, the telephone number of the licensed physician for the compressed air project, and contain instructions that in case of emergency of unknown or doubtful cause or illness, the wearer shall be rushed to the medical lock. The badge shall be worn at all times—off the job, as well as on the job.

(3) Telephone and signal communication. Effective and reliable means of communication, such as bells, whistles, or telephones, shall be maintained at all times between all the following locations;

- (a) The working chamber face;
- (b) The working chamber side of the man lock near the door;
- (c) The interior of the man lock;
- (d) Lock attendant's station;
- (e) The compressor plant;
- (f) The first-aid station;
- (g) The emergency lock (if one is required); and
- (h) The special decompression chamber (if one is required).

(4) Signs and records.

(a) The time of decompression shall be posted in each man lock as follows:

TIME OF DECOMPRESSION FOR THIS LOCK

----- pounds to ----- pounds in
 ----- minutes.
 ----- pounds to ----- pounds in
 ----- minutes.

(Signed by) -----
 (Superintendent)

This form shall be posted in the man lock at all times.

(b) Any code of signals used shall be conspicuously posted near workplace entrances and such other locations as may be necessary to bring them to the attention of all employees concerned.

(c) For each 8-hour shift, a record of employees employed under air pressure shall be kept by an employee who shall remain outside the lock near the entrance. This record shall show the period each employee spends in the air chamber and the time taken from decompression. A copy shall be submitted to the appointed physician after each shift.

(5) Compression.

(a) Every employee going under air pressure for the first time shall be instructed on how to avoid excessive discomfort.

(b) During the compression of employees, the pressure shall not be increased to more than 3 p.s.i.g. within the first minute. The pressure shall be held at 3 p.s.i.g. and again at 7 p.s.i.g. sufficiently long to determine if any employees are experiencing discomfort.

(c) After the first minute the pressure shall be raised uniformly and at a rate not to exceed 10 p.s.i. per minute.

(d) If any employee complains of discomfort, the pressure shall be held to determine if the symptoms are relieved. If, after 5 minutes the discomfort does not disappear, the lock attendant shall gradually reduce the

pressure until the employee signals that the discomfort has ceased. If he does not indicate that the discomfort has disappeared, the lock attendant shall reduce the pressure to atmospheric and the employee shall be released from the lock.

(e) No employee shall be subjected to pressure exceeding 50 pounds per square inch except in an emergency.

(6) Decompression.

(a) Decompression to normal condition shall be in accordance with the decompression tables in Appendix A of this part.

(b) In the event it is necessary for an employee to be in compressed air more than once in a 24-hour period, the appointed physician shall be responsible for the establishment of methods and procedures of decompression applicable to repetitive exposures.

(c) If decanting is necessary, the appointed physician shall establish procedures before any employee is permitted to be decompressed by decanting methods. The period of time that the employees spend at atmospheric pressure between the decompression following the shift and recompression shall not exceed 5 minutes.

(7) Man locks and special decompression chambers.

(a) Man locks.

(i) Except in emergency, no employees employed in compressed air shall be permitted to pass from the working chamber to atmospheric pressure until after decompression, in accordance with the procedures in this part.

(ii) The lock attendant in charge of a man lock shall be under the direct supervision of the appointed physician. He shall be stationed at the lock controls on the free air side during the period of compression and decompression and shall remain at the lock control station whenever there are persons in the working chamber or in the man lock.

(iii) Except where air pressure in the working chamber is below 12 p.s.i.g., each man lock shall be equipped with automatic controls which, through taped programs, cams, or similar apparatus, shall automatically regulate decompressions. It shall also be equipped with manual controls to permit the lock attendant to override the automatic mechanism in the event of an emergency, as provided in item (viii) of this subdivision.

(iv) A manual control, which can be used in the event of an emergency, shall be placed inside the man lock.

(v) A clock, thermometer, and continuous recording pressure gauge with a 4-hour graph shall be installed outside of each man lock and shall be changed prior to each shift's decompression. The chart shall be of sufficient size to register a legible record of variations in pressure within the man lock and shall be visible to the lock attendant. A copy of each graph shall be submitted to the appointed physician after each shift. In addition, a pressure gauge, clock, and thermometer shall also be installed in each man lock. Additional fittings shall be provided so that the test gauges may be attached whenever necessary.

(vi) Except where air pressure is below 12 p.s.i.g. and there is no danger of rapid flooding, all caissons having a

working area greater than 150 square feet, and each bulkhead in tunnels of 14 feet or more in diameter, or equivalent area, shall have at least two locks in perfect working condition, one of which shall be used exclusively as a man lock, the other, as a materials lock.

(vii) Where only a combination man-and-materials lock is required, this single lock shall be of sufficient capacity to hold the employees constituting two successive shifts.

(viii) Emergency locks shall be large enough to hold an entire heading shift and a limit maintained of 12 p.s.i.g. There shall be a chamber available for oxygen decompression therapy to 28 p.s.i.g.

(ix) The man lock shall be large enough so that those using it are not compelled to be in a cramped position and shall not have less than 5 feet clear head room at the center and a minimum of 30 cubic feet of air space per occupant.

(x) Locks on caissons shall be so located that the bottom door shall be not less than 3 feet above the water level surrounding the caisson on the outside. (The water level, where it is affected by tides, is construed to mean high tide.)

(xi) In addition to the pressure gauge in the locks, an accurate pressure gauge shall be maintained on the outer and inner side of each bulkhead. These gauges shall be accessible at all times and shall be kept in accurate working order.

(xii) Man locks shall have an observation port at least 4 inches in diameter located in such a position that all occupants of the man lock may be observed from the working chamber and from the free air side of the lock.

(xiii) Adequate ventilation in the lock shall be provided.

(xiv) Man locks shall be maintained at a minimum temperature of 70°F.

(xv) When locks are not in use and employees are in the working chamber, lock doors shall be kept open to the working chamber, where practicable.

(xvi) Provision shall be made to allow for rescue parties to enter the tunnel if the working force is disabled.

(xvii) A special decompression chamber of sufficient size to accommodate the entire force of employees being decompressed at the end of a shift shall be provided whenever the regularly established working period requires total time of decompression exceeding 75 minutes.

(b) Special decompression chamber.

(i) The headroom in the special decompression chamber shall be not less than a minimum 7 feet and the cubical content shall provide at least 50 cubic feet of airspace for each employee. For each occupant, there shall be provided 4 square feet of free walking area and 3 square feet of seating space, exclusive of area required for lavatory and toilet facilities. The rated capacity shall be based on the stated minimum space per employee and shall be posted at the chamber entrance. The posted capacity shall not be exceeded, except in case of emergency.

(ii) Each special decompression chamber shall be equipped with the following:

(A) A clock or clocks suitably placed so that the attendant and the chamber occupants can readily ascertain the time;

(B) Pressure gauges which will indicate to the attendants and to the chamber occupants the pressure in the chamber;

(C) Valves to enable the attendant to control the supply and discharge of compressed air into and from the chamber.

(D) Valves and pipes, in connection with the air supply and exhaust, arranged so that the chamber pressure can be controlled from within and without;

(E) Effective means of oral intercommunication between the attendant, occupants of the chamber, and the air compressor plant; and

(F) An observation port at the entrance to permit observation of the chamber occupants.

(iii) Seating facilities in special decompression chambers shall be so arranged as to permit a normal sitting posture without cramping. Seating space, not less than 18 inches by 24 inches wide, shall be provided per occupant.

(iv) Adequate toilet and washing facilities, in a screened or enclosed recess, shall be provided. Toilet bowls shall have a built-in protector on the rim so that an air space is created when the seat lid is closed.

(v) Fresh and pure drinking water shall be available. This may be accomplished by either piping water into the special decompression chamber and providing drinking fountains, or by providing individual canteens, or by some other sanitary means. Community drinking vessels are prohibited.

(vi) No refuse or discarded material of any kind shall be permitted to accumulate, and the chamber shall be kept clean.

(vii) Unless the special decompression chamber is serving as the man lock to atmospheric pressure, the special decompression chamber shall be situated, where practicable, adjacent to the man lock on the atmospheric pressure side of the bulkhead. A passageway shall be provided, connecting the special chamber with the man lock, to permit employees in the process of decompression to move from the man lock to the special chamber without a reduction in the ambient pressure from that designated for the next stage of decompression. The passageway shall be so arranged as to not interfere with the normal operation of the man lock, nor with the release of the occupants of the special chamber to atmospheric pressure upon the completion of the decompression procedure.

(8) Compressor plant and air supply.

(a) At all times there shall be a thoroughly experienced, competent, and reliable person on duty at the air control valves as a gauge tender who shall regulate the pressure in the working areas. During tunneling operations, one gauge tender may regulate the pressure in not more than two headings: Provided; That the gauges and controls are all in one location. In caisson work, there shall be a gauge tender for each caisson.

(b) The low air compressor plant shall be of sufficient capacity to not only permit the work to be done safely,

but shall also provide a margin to meet emergencies and repairs.

(c) Low air compressor units shall have at least two independent and separate sources of power supply and each shall be capable of operating the entire low air plant and its accessory systems.

(d) The capacity, arrangement, and number of compressors shall be sufficient to maintain the necessary pressure without overloading the equipment and to assure maintenance of such pressure in the working chamber during periods of breakdown, repair, or emergency.

(e) Switching from one independent source of power supply to the other shall be done periodically to ensure that workability of the apparatus in an emergency.

(f) Duplicate low-pressure air feedlines and regulating valves shall be provided between the source of air supply and a point beyond the locks with one of the lines extending to within 100 feet of the working face.

(g) All high-pressure and low-pressure air supply lines shall be equipped with check valves.

(h) Low-pressure air shall be regulated automatically. In addition, manually operated valves shall be provided for emergency conditions.

(i) The air intakes for all air compressors shall be located at a place where fumes, exhaust gases, and other air contaminants will be at a minimum.

(j) Gauges indicating the pressure in the working chamber shall be installed in the compressor building, the lock attendant's station, and at the employer's field office.

(9) Ventilation and air quality.

(a) Exhaust valves and exhaust pipes shall be provided and operated so that the working chamber shall be well ventilated, and there shall be no pockets of dead air. Outlets may be required at intermediate points along the main low-pressure air supply line to the heading to eliminate such pockets of dead air. The quantity of ventilation air shall be not less than 30 cubic feet per minute.

(b) The air in the workplace shall be analyzed by the employer not less than once each shift, and records of such tests shall be kept on file at the place where the work is in progress. The test results shall be within the threshold limit values specified in part B of this chapter, for hazardous gases, and within 10 percent of the lower explosive limit of flammable gases. If these limits are not met, immediate action to correct the situation shall be taken by the employer.

(c) The temperature of all working chambers which are subjected to air pressure shall, by means of after-coolers or other suitable devices, be maintained at a temperature not to exceed 85°F.

(d) Forced ventilation shall be provided during decompression. During the entire decompression period, forced ventilation through chemical or mechanical air purifying devices that will ensure a source of fresh air shall be provided.

(e) Whenever heat-producing machines (moles, shields) are used in compressed air tunnel operations, a positive means of removing the heat build-up at the heading shall be provided.

(10) Electricity.

(a) All lighting in compressed-air chambers shall be by electricity exclusively, and two independent electric-lighting systems with independent sources of supply shall be used. The emergency source shall be arranged to become automatically operative in the event of failure of the regularly used source.

(b) The minimum intensity of light on any walkway, ladder, stairway, or working level shall be not less than 10 foot-candles, and in all workplaces the lighting shall at all times be such as to enable employees to see clearly.

(c) All electrical equipment, and wiring for light and power circuits, shall comply with requirements of Part I, of this standard, for use in damp, hazardous, high temperature, and compressed air environments.

(d) External parts of lighting fixtures and all other electrical equipment, when within 8 feet of the floor, shall be constructed of noncombustible, nonabsorptive, insulating materials, except that metal may be used if it is effectively grounded.

(e) Portable lamps shall be equipped with noncombustible, nonabsorptive, insulating sockets, approved handles, basket guards, and approved cords.

(f) The use of worn or defective portable and pendant conductors is prohibited.

(11) Sanitation.

(a) Sanitary, heated, lighted, and ventilated dressing rooms and drying rooms shall be provided for all employees engaged in compressed air work. Such rooms shall contain suitable benches and lockers. Bathing accommodations (showers at the ratio of one to 10 employees per shift), equipped with running hot and cold water, and suitable and adequate toilet accommodations, shall be provided. One toilet for each 15 employees, or fractional part thereof, shall be provided.

(b) When the toilet bowl is shut by a cover, there should be an air space so that the bowl or bucket does not implode when pressure is increased.

(c) All parts of caissons and other working compartments shall be kept in a sanitary condition.

(12) Fire prevention and protection.

(a) Firefighting equipment shall be available at all times and shall be maintained in working condition.

(b) While welding or flame-cutting is being done in compressed air, a firewatch with a fire hose or approved extinguisher shall stand by until such operation is completed.

(c) Shafts and caissons containing flammable material of any kind, either above or below ground, shall be provided with a waterline and a fire hose connected thereto, so arranged that all points of the shaft or caisson are within reach of the hose stream.

(d) Fire hose shall be at least 1 1/2 inches in nominal diameter; the water pressure shall at all times be adequate for efficient operation of the type of nozzle used; and the water supply shall be such as to ensure an uninterrupted flow. Fire hose, when not in use, shall be located or guarded to prevent injury thereto.

(e) The power house, compressor house, and all buildings housing ventilating equipment, shall be provided

with at least one hose connection in the waterline, with a fire hose connected thereto. A fire hose shall be maintained within reach of structures of wood over or near shafts.

(f) Tunnels shall be provided with a 2-inch minimum diameter waterline extending into the working chamber and to within 100 feet of the working face. Such line shall have hose outlets with 100 feet of fire hose attached and maintained as follows: One at the working face; one immediately inside of the bulkhead of the working chamber; and one immediately outside such bulkhead. In addition, hose outlets shall be provided at 200-foot intervals throughout the length of the tunnel, and 100 feet of fire hose shall be attached to the outlet nearest to any location where flammable material is being kept or stored or where any flame is being used.

(g) In addition to fire hose protection required by this part, on every floor of every building not under compressed air, but used in connection with the compressed air work, there shall be provided at least one approved fire extinguisher of the proper type for the hazards involved. At least two approved fire extinguishers shall be provided in the working chamber as follows: One at the working face and one immediately inside the bulkhead (pressure side). Extinguishers in the working chamber shall use water as the primary extinguishing agent and shall not use any extinguishing agent which could be harmful to the employees in the working chamber. The fire extinguisher shall be protected from damage.

(h) Highly combustible materials shall not be used or stored in the working chamber. Wood, paper, and similar combustible material shall not be used in the working chamber in quantities which could cause a fire hazard. The compressor building shall be constructed of non-combustible material.

(i) Man locks shall be equipped with a manual type fire extinguisher system that can be activated inside the man lock and also by the outside lock attendant. In addition, a fire hose and portable fire extinguisher shall be provided inside and outside the man lock. The portable fire extinguisher shall be the dry chemical type.

(j) Equipment, fixtures, and furniture in man locks and special decompression chambers shall be constructed of noncombustible materials. Bedding, etc., shall be chemically treated so as to be fire resistant.

(k) Head frames shall be constructed of structural steel or open frame-work fireproofed timber. Head houses and other temporary surface buildings or structures within 100 feet of the shaft, caisson, or tunnel opening shall be built of fire-resistant materials.

(l) No oil, gasoline, or other combustible materials shall be stored within 100 feet of any shaft, caisson, or tunnel opening, except that oils may be stored in suitable tanks in isolated fireproof buildings, provided such buildings are not less than 50 feet from any shaft, caisson, or tunnel opening, or any building directly connected thereto.

(m) Positive means shall be taken to prevent leaking flammable liquids from flowing into the areas specifically mentioned in the preceding subdivision.

(n) All explosives used in connection with compressed air work shall be selected, stored, transported, and used as specified in part T of this chapter.

(13) Bulkheads and safety screens.

(a) Intermediate bulkheads with locks, or intermediate safety screens or both, are required where there is danger of rapid flooding.

(b) In tunnels 16 feet or more in diameter, hanging walkways shall be provided from the face to the man lock as high in the tunnel as practicable, with at least 6 feet of head room. Walkways shall be constructed of noncombustible material. Standard railings shall be securely installed throughout the length of all walkways on open sides in accordance with part K of this chapter. Where walkways are ramped under safety screens, the walkway surface shall be skidproofed by cleats or by equivalent means.

(c) Bulkheads used to contain compressed air shall be tested, where practicable, to prove their ability to resist the highest air pressure which may be expected to be used.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-155-745, filed 11/14/88; Order 74-26, § 296-155-745, filed 5/7/74, effective 6/6/74.]

Part S

DEMOLITION

WAC

296-155-775 Preparatory operations.

WAC 296-155-775 Preparatory operations. (1) Prior to permitting employees to start demolition operations, an engineering survey shall be made, by a competent person, of the structure to determine structural integrity and the possibility of unplanned collapse of any portion of the structure. Any adjacent structure where employees may be exposed shall also be similarly checked. The employer shall have in writing, evidence that such a survey has been performed.

(2) A copy of the survey report and of the plans and/or methods of operations shall be maintained at the job site for the duration of the demolition operation.

(3) Any device or equipment such as scaffolds, ladders, derricks, hoists, etc., used in connection with demolition work shall be constructed, installed, inspected, maintained and operated in accordance with the regulations governing the construction, installation, inspection, maintenance and operation of such device or equipment as specified in other parts of this chapter.

(4) Federal and state codes, safety standards, rules, regulations, and ordinances governing any and all phases of demolition work shall be observed at all times.

(5) Demolition of all buildings and structures shall be conducted under competent supervision, and safe working conditions shall be afforded the employees.

(6) When employees are required to work within a structure to be demolished which has been damaged by fire, flood, explosion, or other cause, the walls or floor shall be shored or braced.

(7) All electric, gas, water, steam, sewer, and other service lines shall be shut off, capped, or otherwise controlled, outside the building line before demolition work is started. In each case, any utility company which is involved shall be notified in advance.

(8) If it is necessary to maintain any power, water or other utilities during demolition, such lines shall be temporarily relocated, as necessary, and protected.

(9) It shall be determined whether asbestos, hazardous materials, hazardous chemicals, gases, explosives, flammable materials, or similarly dangerous substances are present at the work site. When the presence of any such substance is apparent or suspected, testing and removal or purging shall be performed and the hazard eliminated before demolition is started. Removal of such substances shall be in accordance with the requirements of chapters 296-62 and 296-65 WAC.

(10) Where a hazard exists from fragmentation of glass, such hazards shall be removed.

(11) Where a hazard exists to employees falling through wall openings, the opening shall be protected to a height of between thirty-six and forty-two inches.

(12) When debris is dropped without the use of chutes, the area onto which the material is dropped shall be completely enclosed with barricades not less than forty-two inches high and not less than twenty feet back from the projected edge of the opening above. Signs, warning of the hazard of falling materials, shall be posted at each level. Removal shall not be permitted in this lower area until debris handling ceases above.

(13) All floor openings, not used as material drops, shall be covered over with material substantial enough to support the weight of any load which may be imposed. Such material shall be properly secured to prevent its accidental movement.

(14) Except for the cutting of holes in floors for chutes, holes through which to drop materials, preparation of storage space, and similar necessary preparatory work, the demolition of exterior walls and floor construction shall begin at the top of the structure and proceed downward. Each story of exterior wall and floor construction shall be removed and dropped into the storage space before commencing the removal of exterior walls and floors in the story next below.

(15) Workmen shall not be permitted to carry on a demolition operation which will expose men working on a lower level to danger.

(16) Employee entrances to multistory structures being demolished shall be completely protected by sidewalk sheds or canopies, or both, providing protection from the face of the building for a minimum of eight feet. All such canopies shall be at least two feet wider than the building entrances or openings one foot wider on each side thereof, and shall be capable of sustaining a load of one hundred fifty pounds per square foot.

(17) Protruding nails in boards, planks and timber shall be withdrawn, driven in or bent over as soon as the same is removed from the structure being demolished.

(18) Any material to be removed which will cause dust to be formed, shall be sprinkled with water to lay the dust incidental to its removal.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-155-775, filed 11/30/87. Statutory Authority: RCW 49.17.050(2) and 49.17.040. 87-10-008 (Order 87-06), § 296-155-775, filed 4/27/87. Statutory Authority: RCW 49.17.040 and 49.17.050. 86-03-074 (Order 86-14), § 296-155-775, filed 1/21/86; Order 74-26, § 296-155-775, filed 5/7/74, effective 6/6/74.]

Chapter 296-200 WAC

CONTRACTOR CERTIFICATE OF REGISTRATION RENEWALS—SECURITY—INSURANCE

WAC

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|-------------|---------------------------------------------------------------------------------------------|
| 296-200-340 | Right to contested hearing—Place to file. |
| 296-200-350 | Administrative law judge shall preside in contested hearings. |
| 296-200-370 | Contested cases—Notice—Hearing—Summary orders—Informal disposition—Record—Findings of fact. |

WAC 296-200-340 Right to contested hearing—Place to file. If a contractor desires to contest the notice of infraction issued, the contractor shall file two copies of a notice of appeal with the department at the office designated on the notice of infraction, within twenty days of issuance of the infraction. The contractor shall also be required to post an appeal bond of two hundred dollars with the notice of appeal payable to the department. The appeal bond shall be applied to the administrative costs of conducting the appeals of notices of infractions. If the appealing contractor prevails at a contested hearing, then the appeal bond shall be returned to the contractor.

[Statutory Authority: Chapter 18.27 RCW. 87-07-003 (Order 87-08), § 296-200-340, filed 3/5/87; 86-19-086 (Order 86-31), § 296-200-340, filed 9/17/86.]

WAC 296-200-350 Administrative law judge shall preside in contested hearings. A notice of infraction when contested, shall be heard before and determined by an administrative law judge from the office of administrative hearings. The administrative law judge shall conduct hearings in these cases at locations in the county where the infraction occurred. The parties shall have the right to apply to the administrative law judge for a change of venue where the interests of justice would be served.

[Statutory Authority: Chapter 18.27 RCW. 87-07-003 (Order 87-08), § 296-200-350, filed 3/5/87; 86-19-086 (Order 86-31), § 296-200-350, filed 9/17/86.]

WAC 296-200-370 Contested cases—Notice—Hearing—Summary orders—Informal disposition—Record—Findings of fact. The hearings shall be conducted in accordance with chapter 34.04 RCW and chapter 10-08 WAC.

(1) An appeal from the administrative law judges' determination or order shall be to the superior court pursuant to chapter 34.04 RCW.

[Statutory Authority: Chapter 18.27 RCW. 87-07-003 (Order 87-08), § 296-200-370, filed 3/5/87; 86-19-086 (Order 86-31), § 296-200-370, filed 9/17/86.]

Chapter 296-304 WAC

SAFETY STANDARDS FOR SHIP REPAIRING,
SHIPBUILDING AND SHIP-BREAKING

WAC

296-304-06013 Health and sanitation.

WAC 296-304-06013 Health and sanitation. (1) No chemical product, such as a solvent or preservative; no structural material, such as cadmium or zinc coated steel, or plastic material; and no process material, such as welding filler metal; which is a hazardous material within the meaning of WAC 296-304-01001(19), shall be used until the employer has ascertained the potential fire, toxic, or reactivity hazards which are likely to be encountered in the handling, application, or utilization of such a material.

(2) In order to ascertain the hazards, as required by subsection (1) of this section, the employer shall obtain the following items of information which are applicable to a specific product or material to be used:

(a) The name, address, and telephone number of the source of the information specified in this section preferably those of the manufacturer of the product or material.

(b) The trade name and synonyms for a mixture of chemicals, a basic structural material, or for a process material; and the chemical name and synonyms, chemical family, and formula for a single chemical.

(c) Chemical names of hazardous ingredients, including, but not limited to, those in mixtures, such as those in: (i) Paints, preservatives, and solvents; (ii) alloys, metallic coatings, filler metals and their coatings or core fluxes; and (iii) other liquids, solids, or gases (e.g., abrasive materials).

(d) An indication of the percentage, by weight or volume, which each ingredient of a mixture bears to the whole mixture, and of the threshold limit value of each ingredient, in appropriate units.

(e) Physical data about a single chemical or a mixture of chemicals, including boiling point, in degrees Fahrenheit; vapor pressure, in millimeters of mercury; vapor density of gas or vapor (air=1); solubility in water, in percent by weight; specific gravity of material (water=1); percentage volatile, by volume, at 70°F.; evaporation rate for liquids (either butyl acetate or ether may be taken as 1); and appearance and odor.

(f) Fire and explosion hazard data about a single chemical or a mixture of chemicals, including flashpoint, in degrees Fahrenheit; flammable limits, in percent by volume in air; suitable extinguishing media or agents; special fire fighting procedures; and unusual fire and explosion hazard information.

(g) Health hazard data, including threshold limit value, in appropriate units, for a single hazardous chemical or for the individual hazardous ingredients of a mixture as appropriate, effects of overexposure; and emergency and first aid procedures.

(h) Reactivity data, including stability, incompatibility, hazardous decomposition products, and hazardous polymerization.

(i) Procedures to be followed and precautions to be taken in cleaning up and disposing of materials leaked or spilled.

(j) Special protection information, including use of personal protective equipment, such as respirators, eye protection, and protective clothing, and of ventilation, such as local exhaust, general, special, or other types.

(k) Special precautionary information about handling and storing.

(l) Any other general precautionary information.

(3) The pertinent information required by subsection (2) of this section shall be recorded either on United States Department of Labor Form LSB 00S-4, Material Safety Data Sheet, or on an essentially similar form which has been approved by the department of labor and industries. Copies of Form LSB 00S-4 may be obtained at any of the following regional offices of the occupational safety and health administration:

(a) Pacific region. (Arizona, California, Hawaii, and Nevada.)

10353 Federal Building, 450 Golden Gate Avenue, Box 36017, San Francisco, Calif. 94102.

(b) Region X, OSHA, (Alaska, Washington, Idaho, and Oregon), Federal Office Building, 909 First Avenue, Seattle, Washington 98174.

A completed MSDS form shall be preserved and available for inspection for each hazardous chemical on the worksite.

(4) The employer shall instruct employees who will be exposed to the hazardous materials as to the nature of the hazards and the means of avoiding them.

(5) The employer shall provide all necessary controls, and the employees shall be protected by suitable personal protective equipment against the hazards identified under subsection (1) of this section and those hazards for which specific precautions are required in WAC 296-304-020 through 296-304-04013.

(6) The employer shall provide adequate washing facilities for employees engaged in the application of paints or coatings or in other operations where contaminants can, by ingestion or absorption, be detrimental to the health of the employees. The employer shall encourage good personal hygiene practices by informing the employees of the need for removing surface contaminants by thorough washing of hands and face prior to eating or smoking.

(7) The employer shall not permit eating or smoking in areas undergoing surface preparation or preservation or where shiprepairing, shipbuilding, or shipbreaking operations produce atmospheric contamination.

(8) The employer shall not permit employees to work in the immediate vicinity of uncovered garbage and shall ensure that employees working beneath or on the outboard side of a vessel are not subject to contamination by drainage or waste from overboard discharges.

(9) Requirements of WAC 296-62-054 et seq., will apply to shiprepairing, shipbuilding, and shipbreaking when potential hazards of chemicals and communicating information concerning hazards and appropriate protective equipment is applicable to an operation.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-304-06013, filed 7/6/88; Order 76-7, § 296-304-06013, filed 3/1/76; Order 74-25, § 296-304-06013, filed 5/7/74.]

Chapter 296-305 WAC

SAFETY STANDARDS FOR FIRE FIGHTERS

WAC

- 296-305-007 Definitions.
- 296-305-060 Personal protective equipment and clothing.
- 296-305-06003 Hearing protection.
- 296-305-06005 Hand protection.
- 296-305-06011 Head protection.
- 296-305-063 Respiratory equipment.
- 296-305-06301 Repealed.
- 296-305-06303 Repealed.
- 296-305-06305 Repealed.
- 296-305-06307 Repealed.
- 296-305-06309 Repealed.
- 296-305-06311 Repealed.
- 296-305-06313 Repealed.
- 296-305-064 Fire overhaul.
- 296-305-06505 Sleeping areas.
- 296-305-06507 Apparatus area.
- 296-305-06509 Refueling areas.
- 296-305-07001 Design and construction.
- 296-305-07003 Automotive fire apparatus equipment.
- 296-305-100 Ladders.
- 296-305-9901 Repealed.
- 296-305-9902 Repealed.
- 296-305-9903 Repealed.
- 296-305-9904 Repealed.
- 296-305-9905 Repealed.
- 296-305-9906 Repealed.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

- 296-305-06301 Respiratory equipment effective dates. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06301, filed 11/30/83; Order 77-20, § 296-305-06301, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-06303 Respiratory equipment approvals. [Order 77-20, § 296-305-06303, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-06305 Respiratory equipment inspection. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06305, filed 11/30/83; Order 77-20, § 296-305-06305, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-06307 Respiratory equipment testing. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06307, filed 11/30/83; Order 77-20, § 296-305-06307, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-06309 Respiratory protection equipment maintenance and repair. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06309, filed 11/30/83; Order 77-20, § 296-305-06309, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.

- 296-305-06311 Respiratory equipment training. [Order 77-20, § 296-305-06311, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-06313 Filling air cylinders. [Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06313, filed 11/30/83.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-9901 Testing extension ladders—Figure 14. [Order 77-20, Illustration (codified as WAC 296-305-9901), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-9902 Testing extension ladders—Figure 15. [Order 77-20, Illustration (codified as WAC 296-305-9902), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-9903 Testing extension ladders—Illustration. [Order 77-20, Illustration (codified as WAC 296-305-9903), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-9904 Testing extension ladders—Illustration. [Order 77-20, Illustration (codified as WAC 296-305-9904), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-9905 Testing extension ladders—Illustration. [Order 77-20, Illustration (codified as WAC 296-305-9905), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.
- 296-305-9906 Testing extension ladders—Illustration. [Order 77-20, Illustration (codified as WAC 296-305-9906), filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.] Repealed by 88-14-108 (Order 88-11), filed 7/6/88. Statutory Authority: Chapter 49.17 RCW.

WAC 296-305-007 Definitions. Unless the context indicates otherwise, words used in this chapter shall have the meaning given in this section.

- (1) Aerial ladder: A ladder mounted on top of an apparatus, hydraulic or pneumatic controlled.
- (2) Aerial platform: A device consisting of two or more booms or sections with a passenger carrying platform assembly.
- (3) Aerial tower: Telescopic elevating platform or water tower assembly usually with a ladder on top of the section.
- (4) Ancillary clothing: Outer garments auxiliary or supplemental to other protective clothing provided for fire fighters.
- (5) ANSI: American National Standards Institute.
- (6) Apparatus: A mobile piece of fire fighting equipment such as pumper, aerial, tanker, etc.
- (7) Approved: A method, equipment, procedure, practice, tool, etc., which is sanctioned, consented to, confirmed or accepted as good or satisfactory for a particular purpose or use by a person or organization authorized to make such a judgment.

(8) Bag mask: A hand operated device consisting of a bellows type bag and a face piece used to administer artificial respiration to an individual.

(9) Beacon: A flashing or rotating light.

(10) Chief: An employer representative responsible for the fire department's operation.

(11) City service apparatus: An all purpose apparatus which carries ground ladders as well as forceable entry tools, salvage and overhaul equipment, and fire fighters.

(12) Combat scene: The site where the suppression of a fire or emergency exists.

(13) dBA: A measure of noise level expressed as decibels measured on the "A" scale.

(14) Deck pipe: A permanently mounted device which delivers a large stream of water.

(15) Decontamination: A process by which hazardous substances are removed from protective clothing and equipment of personnel exposed to those substances.

(16) Department: Department of labor and industries.

(17) Director of fire department: The chief or principle administrator of the fire department.

(18) Drill tower: A structure which may or may not be attached to the station and which is principally used for training fire fighters in fire service techniques.

(19) Employee: An employee of an employer who is employed in the business of his employer whether by way of manual labor or otherwise and every person in this state who is engaged in the employment of or who is working under an independent contract the essence of which is his personal labor for an employer under this chapter whether by way of manual labor or otherwise.

(20) Employer: Any person, firm, corporation, partnership, business trust, legal representative, or other business entity which engages in any business, industry profession, or activity in this state and employs one or more employees or who contracts with one or more persons, the essence of which is the personal labor of such person or persons and includes the state, counties, cities, and all municipal corporations, public corporations, political subdivisions of the state, and charitable organizations.

(21) Employer representative: A fire department officer authorized by the chief or director to act in his behalf.

(22) Engine (pumper): A piece of apparatus equipped with hose and a pump for the purpose of supplying water under pressure through hose lines.

(23) Explosion proof: Capable of withstanding an explosion of a specified gas or vapor which may occur within it and of preventing the ignition of a specified gas or vapor surrounding the enclosure by sparks, flashes, or explosion of the gas or vapor within, and which operates at such an external temperature that a surrounding flammable atmosphere will not be ignited thereby.

(24) Fastest means available: The (nearest-closest) telephone, portable radio, mobile radio, telephone/radio dispatcher or any other mode of mechanical communication.

(25) Fire combat training: Training received by fire fighters on the drill ground, drill tower, or industrial site to maintain the fire fighter's proficiency.

(26) Fire fighter: An officer or any employee who by virtue of his position in a fire department has a duty to engage in the fighting and extinguishment of fires.

(27) Fire retardant: A material to reduce, stop or prevent the flame spread.

(28) Foot stand, ladder: Devices attached to inside of beams of ladders that when folded down, provide foot space.

(29) Fly: Extendable sections of ground or aerial ladders.

(30) Hazardous condition: The physical condition or act which is causally related to accident occurrence. The hazardous condition is related directly to both the accident type and the agency of the accident.

(31) Hazardous substances: Substances that present an unusual risk to persons due to properties of toxicity, chemical activity, corrosivity, etiological hazards of similar properties.

(32) HEPA filtration: High efficiency particulate air filtration found in vacuum systems capable of filtering 0.3 micron particles with 99.97% efficiency.

(33) Hose bed: Portion of fire apparatus where hose is stored.

(34) Hose tower: A vertical enclosure where hose is hung to dry.

(35) Industrial fire brigade: An organized group of employees whose primary employment is other than fire fighting; who are knowledgeable, trained and skilled in the safe evacuation of employees during emergency situations, and in assisting in fire fighting operations.

(36) Jack, ground: Heavy jacks attached to frame of chassis of the aerial-equipped apparatus to provide stability when the aerial portion of the apparatus is used.

(37) Ladder company: The fire company manning an aerial ladder truck and especially trained in ladder work, ventilation, rescue, forcible entry, salvage and related tasks.

(38) Ladder pipe: A heavy stream nozzle attached to an aerial ladder usually supplied by a 3-inch hose from a Siamese intake at ground level.

(39) Life line: Length of rope to which employees and employer representatives are secured when in extremely hazardous areas.

(40) Life line gun: A gun designed to shoot a rope line, for rescue, to persons in distress such as in water, canyons, on cliffs and buildings, etc.

(41) Life net: A rescue item, commonly carried on ladder trucks, consisting of heavy canvas supported by a folding metal frame and springs and containing a pad to soften impact.

(42) Live fire training: Any fire set within a structure, tank, pipe, pan, etc., under controlled conditions to facilitate the training of fire fighters under actual fire conditions.

(43) Locking in: The act of securing oneself to a ladder by hooking a leg over a rung and placing top of foot against the other leg or against the ladder.

(44) Manned station: A fire station continuously occupied by fire fighters on scheduled work shifts. The manned station may also serve as headquarters for volunteers.

(45) MESA: Mining Enforcement and Safety Administration.

(46) Monitor: A portable device which delivers a large stream of water.

(47) NFPA: National Fire Protection Association.

(48) NIOSH: National Institute of Occupational Safety and Health.

(49) Nondestructive testing: A test to determine the characteristics or properties of a material or substance that does not involve its destruction or deterioration.

(50) Nonskid: The surface treatment that lessens the tendency of a foreign substance to reduce the coefficient of friction between opposing surfaces.

(51) Overhauling: That portion of fire extinguishment involving discovery of hidden fires or smoldering material.

(52) Outrigger: Manually or hydraulically operated metal enclosures and jacks which are extended and placed in contact with the ground to give the apparatus a wide, solid base to support different loads.

(53) Place of employment: Any premises, room or other place where an employee or employees are employed for the performance of labor or service over which the employer has the right of access or control.

(54) Platform: The portion of a telescoping or articulating boom used as an elevated working surface.

(55) Pole hole: An opening in a floor through which a pole passes and employees slide to get from one floor to another.

(56) Pompier ladder: Ladder constructed with a single spar to which a hook is attached on one end and rungs attached to the spar.

(57) Prefire training: The training of fire fighters in recognizing sources and locations of potential fires and the method of fire combat to be used.

(58) Probable fatality: An injury which by the doctor's prognosis could lead to death.

(59) Pumper (engine): An apparatus equipped with hose and a pump for the purpose of supplying water under pressure through hose lines.

(60) Qualified: One who by possession of a recognized degree, certificate or professional standing, or who by extensive knowledge, training or experience has successfully demonstrated his ability to solve or resolve problems related to the subject matter, the work or the project.

(61) RCW: Revised Code of Washington.

(62) Respiratory equipment: Self-contained breathing apparatus designed to provide the wearer with a supply of respirable atmosphere carried in or generated by the breathing apparatus. When in use, this breathing apparatus requires no intake of air or oxygen from the outside atmosphere.

(a) Respirators (closed circuit): Those types of respirators which retain exhaled air in the system and recondition such air for breathing again.

(b) Respirators (open circuit): Those types of respirators which exhaust exhaled air to the outside of the mask into the ambient air.

(c) Respirators (demand): Those types of respirators whose input air to the mask is started when a negative pressure is generated by inhalation.

(d) Respirators (pressure demand): Those types of respirators which constantly and automatically maintain a positive pressure in the mask by the introduction of air when the positive pressure is lowered (usually from .018 psi to .064 psi) through the process of inhalation or leakage from the mask.

(63) Responding: The act of answering an emergency call or other alarm.

(64) Safe and healthful working environment: The work surroundings of an employee with minimum exposure to unsafe acts and/or unsafe conditions.

(65) Safety net: A rope or nylon strap net not to exceed 6-inch mesh, stretched and suspended above ground level at the base of drill tower, and at such a height that a falling body would be arrested prior to striking the ground.

(66) Safety officer: Employer representative as assigned by chief of fire department.

(67) Scabbard: A guard which will prevent accidental injury and covers the blade and pick of an axe or other sharp instrument when worn by the fire fighter.

(68) Shall: Means mandatory.

(69) Should: Means recommended.

(70) Siamese: A hose appliance having two or more female inlets with one male outlet.

(71) Signalman: A person so positioned that he can direct an activity, such as apparatus entering or leaving a fire station, where the operator's vision is obstructed or obscured.

(72) Station (fire station): Structure in which fire service apparatus and/or personnel are housed.

(73) Tailboard: Standing space on the side or rear of an engine or pumper apparatus where fire fighters ride.

(74) Tillerman: Rear driver of tractor-trailer aerial ladder.

(75) Turnout clothing: Outer garments worn by fire fighters for personal protection consisting of helmet, gloves, coat and pants with vapor and thermal barrier liners, and boots.

(76) Turntable: The rotating surface located at the base of an aerial ladder, or boom, on aerial apparatus.

(77) Unmanned station: A station serving as headquarters for volunteer fire fighters which may or may not be attended by a chief or other officials responsible for directing the company's activities.

(78) Volunteer: Individual other than a fully paid fire fighter whose primary employment is other than fire fighting.

(79) Wheel blocks (chocks): A block or wedge placed under a wheel to prevent motion.

(80) Work environment: The surrounding conditions, influences or forces to which an employee is exposed while working.

(81) Work place: Any plant, yard, premises, room or other place where an employee or employees are employed for the performance of labor or service over which the employer has the right of access or control,

and includes, but is not limited to, all work places covered by industrial insurance under Title 51 RCW, as now or hereafter amended.

[Statutory Authority: Chapter 49.17 RCW, 88-14-108 (Order 88-11), § 296-305-007, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-007, filed 11/30/83; Order 77-20, § 296-305-007, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-060 Personal protective equipment and clothing. (1) Employers shall provide and maintain at no cost to the employee and assure the use of all protective clothing and equipment required by this standard. When the employer has agreed to provide funds in lieu of the actual clothing and equipment, funding shall be adequate to allow the purchase of such clothes and equipment without cost to the employee. The employer shall assure that the protective clothing ordered or purchased after the effective date of this standard meets the requirements of this standard. Four years after this effective date the employer shall assure that all fire fighters wear protective clothing meeting the requirements of this standard when performing interior structural fire fighting. Wearing anything less than full protective clothing may be allowed by the employer's written policy as set forth in (3)(d) of this section.

(2) Personal protective equipment and clothing shall be of a type approved by NIOSH, MESA, NFPA, or as required by this section.

(3) Every fire fighter when working upon fire extinguishment on the emergency fire ground or training fire, shall wear a complete set of equipment and clothing, except when combating grass or wildland fires. Provided, clothing worn in place of full turnouts when fighting grass or wildland fires should comply with the following performance standard:

(a) Ancillary clothing.

(i) Flame resistance: When tested in accordance with Federal Test 191, Method 5903.2 "Flame Resistance of Cloth, Vertical" (standard small scale test), the test results shall not exceed the following limits:

(A) 2.0 seconds after flame

(B) 4.0 seconds after glow

(C) 6.0 inches average char length or 4.0 inches

Ignition of the material shall not produce any melting and dripping of molten or flaming material. It is specifically required that upon exposure to flaming ignition or intense heat, the material will not adhere to the skin of the wearer so as to cause serious skin burns.

Exception: Ancillary clothing of 100% wool, with a weight of at least 14 ounces per lineal yard of 54-inch width shall be considered to be flame resistant.

(ii) Laundering: Garments shall be capable of withstanding not less than 50 washings or 25 dry cleanings with no significant changes in fire retardancy.

(iii) A label must be permanently attached, and shall attest that the fabric has been tested and meets the requirements of this section. The label shall include:

(A) Lot number

(B) The name and number of the specified test

(C) The date of the successful test.

(b) all turnout clothing placed into service after the effective date of these regulations shall meet the requirements set forth in this standard.

(c) Ancillary clothing placed into service after the effective date of these regulations shall meet the requirements set forth in this standard.

(d) The use of ancillary clothing does not exclude each employee from having a full set of turnouts. A written policy and procedure specifying the conditions under which less than a complete set of personal protective equipment and clothing can be worn, such as grass or wildland fires, shall be established by each employer and distributed to both fully paid and volunteer fire fighters.

(4) Written procedures with regard to repair, maintenance and servicing shall be established for the conservation of personal protective equipment. This provision applies to the fire fighter's personally owned equipment as well as to the employer owned equipment.

(5) Fire fighters shall wear the personal protective clothing and equipment designated for the task.

(6) Turnout clothing as defined in WAC 296-305-007.

(a) New turnout clothing purchased thirty days after the effective date of this chapter shall be manufactured and labeled to comply with the specifications of this chapter and NFPA Standard 1971, 1986 edition, "Protective Clothing for Structural Fire Fighting."

(b) All turnout clothing used by full-time fire department personnel after January 1, 1989, shall be at least equivalent to the specifications of this chapter and NFPA Standard 1971, 1981 edition.

(c) All turnout clothing used by volunteer fire department personnel after January 1, 1991, shall be at least equivalent to the specifications of this chapter and NFPA Standard 1971, 1981 edition.

(7) Inspection and maintenance.

(a) All turnout clothing shall be inspected by qualified personnel at not less than one hundred eighty day intervals.

(b) Turnout clothing shall be maintained as required by the manufacturer.

(8) Turnout clothing which is damaged or does not comply with this section shall not be used.

[Statutory Authority: Chapter 49.17 RCW, 88-14-108 (Order 88-11), § 296-305-060, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-060, filed 11/30/83; Order 77-20, § 296-305-060, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-06003 Hearing protection. The hearing protection requirements of the general occupational health standards, chapter 296-62 WAC, shall be applicable whenever personnel are exposed to noise levels above the permissible limits including at the fire station, while in transit or at a fire scene.

[Statutory Authority: Chapter 49.17 RCW, 88-14-108 (Order 88-11), § 296-305-06003, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-06003, filed 11/30/83; Order 77-20, § 296-305-06003, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-06005 Hand protection. Any gloves purchased after the effective date of these standards shall meet the following criteria:

(1) Hand and wrist protection at the fire combat scene and during overhaul work shall consist of gloves or a glove system which complies with the requirements of this section.

(2) Gloves purchased after January 1, 1989, shall comply with NFPA Standard, 1973, 1983 edition.

(3) Gloves used after January 1, 1991, shall comply with NFPA Standard 1973, 1983 edition.

(4) Gloves used between January 1, 1989, and January 1, 1991, may comply with either NFPA Standard 1973, 1983 edition, or the 1976 NIOSH criteria document, Volume II: Glove Criteria and Test Methods.

(5) Fire fighters engaged in activities creating hazardous exposures to electricity shall wear approved hand protection.

(a) Electrical rubber gloves guaranteed by the manufacturer to pass a minimum dielectric test of 10,000 volts shall be worn.

(b) Rubber gloves shall be numbered and records kept for test purposes.

(c) Rubber gloves shall be tested by the following maximum retesting schedule:

Rubber Protective Gloves	Natural Rubber (Months)	Synthetic Rubber (Months)
New	12	18
Reissued	9	15

After use, the rubber protective gloves shall be cleaned, sanitized, tested and restored for future use. The test after use shall consist of an air pressure test which is performed by grasping the cuff at opposite sides and twirling the glove so as to roll it up the cuff to produce air pressure within the glove. The glove shall be inspected for leaks, cuts, abrasions and thin places in the rubber. Patching or vulcanizing of rubber protective gloves is prohibited. Any rubber gloves found to be defective shall be removed from service and marked as being defective.

(d) Protector gloves must be worn at all times over electrical rubber gloves.

(e) Electrical rubber gloves, when not in use, shall be carried in a suitable bag provided and designed for that purpose.

(f) When electrical rubber gloves are transported on apparatus, a compartment or box shall be used to store the gloves. No other equipment shall be placed in this compartment or box.

[Statutory Authority: Chapter 49.17 RCW, 88-14-108 (Order 88-11), § 296-305-06005, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-06005, filed 11/30/83; Order 77-20, § 296-305-06005, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-06011 Head protection. (1) Head protection shall consist of a protective head device with chin strap. Ear flaps are optional. All protective head devices shall meet the performance, construction and

testing requirements for configuration, frame and head construction, electrical insulation and visibility and reflectivity as established by the National Fire Prevention and Control Administration of the United States Department of Commerce and contained in "Model Performance Criteria for Structural Firefighters Helmets" printed August 1977.

(2) All helmets used by fire department personnel after January 1, 1991, shall be equivalent to the specifications of this chapter and NFPA 1972, 1980 edition.

(3) All helmets purchased thirty days after the adoption of this chapter shall be manufactured and labeled as complying with the specifications of this chapter and NFPA 1972, 1987 edition.

(a) Helmets shall be maintained in accordance with the manufacturers recommendations.

(b) Helmets which are damaged or do not comply with this section shall not be used.

[Statutory Authority: Chapter 49.17 RCW, 88-14-108 (Order 88-11), § 296-305-06011, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050, 83-24-013 (Order 83-34), § 296-305-06011, filed 11/30/83; Order 77-20, § 296-305-06011, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-063 Respiratory equipment. (1) Approved self-contained respiratory equipment shall be available and used by all employees who enter into hazardous atmospheres. Filter canister masks are not approved.

(2) Respiratory protection equipment used in fire combat situations shall be classified as self-contained pressure demand type and shall have a minimum rating of one-half hour nominal service life.

All respirators using compressed air shall have an audible warning device which will activate when the air pressure drops below twenty percent of the rated capacity.

(3) In structural or confined space fires at least one person trained in the use of self-contained breathing equipment and equipped with such equipment shall remain free of the contaminated area in order to afford rescue potential for exposed, disabled fire fighters.

(4) The respiratory protection requirements of the Occupational health standards—Safety standards for carcinogens, chapter 296-62 WAC, shall apply. A respirator program shall be developed which includes standard operating procedures addressing the following:

(a) Respiratory equipment inspections. The step-by-step inspection procedures included in the Washington state fire service training program shall be considered the criteria for a minimum inspection procedure.

(b) Breathing air cylinder filling and testing. Only personnel trained, experienced, and knowledgeable in the equipment and procedures shall fill or test air cylinders.

(c) Respiratory equipment training.

(i) Training shall address the same subjects as those covered by the Washington state fire service training program and shall involve at least the same number of hours.

(ii) After completing such training, each fire fighter shall practice at least quarterly, for each type and manufacture of respirator available for use, the step-by-step

procedure for donning the respirator and checking it for proper function.

(5) At the end of suppression activities to include fire overhaul and before returning to quarters.

(a) Fire fighters shall be decontaminated prior to removal of respirators whenever fire fighting activities result in exposure to hazardous substances.

(b) When exchanging air supply bottles during suppression or overhaul activities, reasonable precautions shall be taken to maintain an uncontaminated atmosphere to the breathing zone and facepiece supply hose.

(c) The effective date of this item shall be nine months after the effective date of this section.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-063, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-063, filed 11/30/83; Order 77-20, § 296-305-063, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-06301 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-305-06303 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-305-06305 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-305-06307 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-305-06309 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-305-06311 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-305-06313 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-305-064 Fire overhaul. (1) Training shall be provided to fire fighters and officers in order that they will be knowledgeable in the identification and handling of asbestos containing materials likely to be encountered during a fire response.

(2) During the overhaul phase officers shall identify materials likely to contain asbestos, limiting the breaching of structural materials to that which is necessary to prevent the rekindle.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-064, filed 7/6/88.]

WAC 296-305-06505 Sleeping areas. (1) Every fire station sleeping area shall be provided with approved detectors of products of combustion other than heat conforming to Uniform Building Code Standard 43-6, mounted in the sleeping room and on the ceiling or wall at a point centrally located in the corridor or area giving access to rooms used for sleeping purposes. Where sleeping rooms are on an upper level, a detector shall be placed at the center of the ceiling directly above the

stairway and at the top of the pole hole openings. All detectors shall be located within 12 inches of the ceiling. Care shall be exercised to insure that the installation will not interfere with the operating characteristics of the detector. When activated, the detector(s) shall provide an audible alarm.

(2) Smoking shall not be allowed in sleeping area after fire fighters turn-in.

(3) Dormitories for fire stations designed after December 17, 1977, shall be located in such a position that vehicular traffic adjacent to the station house does not present a hazard.

(4) The employer shall establish and implement a schedule for the cleaning of bedding.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-06505, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06505, filed 11/30/83; Order 77-20, § 296-305-06505, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-06507 Apparatus area. (1) Three feet of clearance shall be maintained around apparatus parked within the station where the station's width permits.

(2) Stations built after December 17, 1977, shall have a minimum of three feet of clearance around the apparatus, which shall be maintained free of any storage or obstruction.

(3) The station's apparatus floors shall be kept free of grease, oil, water and all tripping hazards. The drying of hose on the apparatus floor shall not be considered a tripping hazard.

(4) No Class I or II flammable liquids shall be used for cleaning purposes to remove grease or dirt from apparatus.

(5) Exhaust fumes from diesel or gasoline apparatus shall be emitted to the outside air. Ventilation provided by fully opened apparatus bay doors shall be considered adequate.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-06507, filed 7/6/88; Order 77-20, § 296-305-06507, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-06509 Refueling areas. (1) Refueling pumps, if installed, shall be in accordance with the provisions of the Uniform Fire Code-1985.

(2) Dispensing of Class 1 liquids shall be as required in the Uniform Fire Code-1985.

(3) Fuel tanks shall not be filled while the engine is running, except during fire ground operations. Spillage should be avoided.

(4) Spillage of oil or fuel shall be carefully washed away or completely evaporated and the fuel tank cap replaced before restarting engine.

(5) Fueling areas shall be posted - "NO SMOKING-STOP YOUR MOTOR."

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-06509, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-06509, filed 11/30/83; Order 77-20, § 296-305-06509, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-07001 Design and construction. (1) All fire apparatus with the exception of specialized equipment, shall conform to the minimum safety standards contained in N.F.P.A. Booklet No. 1901.

(2) Fire apparatus, purchased after December 17, 1977, weighing 10,000 pounds or more shall conform with the following department of transportation standards, when applicable:

- (a) 571-121 Standard 121, Air brake systems;
- (b) 571-106 Standard 106, Hydraulic brake hoses;
- (c) 571-211 Standard 211, Wheel nuts, wheel discs, hub caps.

(3) Employers purchasing used fire apparatus or used military equipment shall not be required to bring them under a more stringent code than the one in force at the time the apparatus was manufactured. The exception to this rule would be seat belts and communication systems between the tailboard or tiller's seat and driver compartment as stipulated in WAC 296-305-07003(2), 296-305-07007(1), 296-305-105 (5)(a) and (b), and 296-305-110(4).

(4) Where practicable for the intended application and use, new apparatus purchased after December 17, 1977, shall have covered crew cabs.

(5) Fire apparatus tailboards and steps leading to the cab shall have a nonskid rough surface.

(6) Shields shall be provided for individuals who ride the side of city service apparatus to protect them from flying debris and weather.

(7) Exhaust systems shall be installed and maintained in proper condition, and shall be so designed as to eliminate the exposure of the fire fighter to the exhaust gases and fumes.

(8) Spinner knobs shall not be attached to steering handwheels of fire apparatus.

(9) The transmission shifting pattern of the apparatus shall be clearly stenciled or labeled and posted so it can be clearly read by the driver while operating the apparatus.

(10) The height of the apparatus from the ground to the top of the beacon or highest point of apparatus shall be clearly labeled in a place where it can be easily and clearly read by the driver while operating the apparatus.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-07001, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-07001, filed 11/30/83; Order 77-20, § 296-305-07001, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-07003 Automotive fire apparatus equipment. (1) Vehicles used to transport fire fighter and employer representatives shall have compartments for carrying sharp tools, saws, chisels, axes, etc., or if carried on the outside of the apparatus, sharp points and edges shall be covered to prevent injury to fire fighters and employer representatives.

(2) Personnel restraints for traveling.

(a) All personnel shall ride in a seated position if adequate seats are available.

(b) While in transit, all operators and passengers shall be protected from accidental displacement out of or off

the apparatus. Means of restraint may include but are not limited to:

(i) For seated passengers, correct use of at least a pelvic seatbelt. Seatbelts shall comply with Part 49 CFR Section 571, Standards 209 and 210, U.S. DOT Regulations;

(ii) For tailboard passengers, containment within a guardrail enclosure or correct use of a safety belt and short lanyard securely connected to the apparatus;

(iii) Safety belt lanyards shall be secured to an anchorage or structural member capable of supporting a minimum dead weight of 5400 pounds.

(c) Safety belts shall be constructed and maintained in compliance with ANSI A10.14-1975.

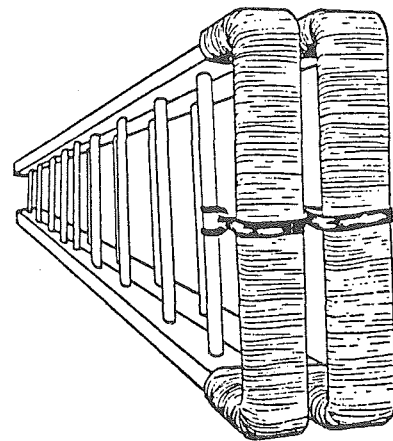
(d) Lanyards shall be a minimum of one-half inch nylon or equivalent with a nominal breaking strength of 5400 pounds.

(e) Minimum structural members for tailboard enclosures shall be two-inch diameter standard schedule 40 pipe or the equivalent. The enclosure shall be constructed to a minimum toprail height of forty-two inches and shall include a midrail and a toeboard at least four inches high. Access door(s) shall be constructed and mounted to achieve structural integrity comparable to the remainder of the enclosure. The door(s) latch shall be equivalent to a one-quarter inch by two-inch solid steel bar.

(3) Each fire apparatus shall carry a United States Department of Transportation chemical identification book or the equivalent.

(4) Ladders stowed on the sides of apparatus, which protrude into a passage area of a fire station, shall have guards over the butt ends. This guard can be in the form of a short piece of 2-1/2 inch hose.

(5) No employer shall permit automotive fire apparatus equipment which has an obstructed view to the rear to be used in reverse gear unless the equipment has in operation a reverse signal alarm distinguishable from the surrounding noise level.



[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-07003, filed 7/6/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-07003, filed 11/30/83; Order 77-20, § 296-305-07003, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

WAC 296-305-100 Ladders. This section establishes the minimum requirements for the construction, care and use of the common types of ladders used in fire combat.

(1) Ladder locks or pawls on extension ladders shall be so fastened or secured to the beams that vibration and use will not cause loosening of bolts and nuts. Pawls or ladder locks shall be so constructed that the hook portion of the pawl that engages the rung shall have sufficient bearing surface or area to prevent the hook from cutting into rungs when engaged. Such hooks shall be properly finished to eliminate sharp edges and points.

(2) Staypoles or tormenters shall be furnished on all extension ladders extending over 36 feet. Staypole or tormenters spikes shall not project beyond the end of the ladder when nested.

(3) All ladders shall be stored in a manner to provide ease of access for inspection, and to prevent danger of accident when withdrawing them for use.

(4) All ladders regardless of type must be inspected thoroughly after each use. Records shall be kept of the inspections and repairs.

(5) The following metal ladder components shall be checked:

(a) Rungs for welds, damage or weakness caused by overloading or bumping against other objects, looseness and cracks, etc.

(b) Beams for welds, rivets and bolts, signs of strain or metal fatigue, and deformation from heat or overloading.

(c) Halyards for the same defects listed for wood ladder halyards and cable halyards, for fraying or breaking.

(6) Methods of fastening ladder halyards, either of wire or fibrous material, shall be in a manner that the connection is stronger than the halyard.

(7) Any defect noted in above visual inspection shall be corrected prior to testing.

(8) Every portable ladder shall be tested following the correction of defects disclosed by the visual inspections.

(9) New ground ladders purchased after the effective date of this chapter shall be constructed and certified in accordance with the requirements of NFPA Standard 1931, 1984 edition.

(10) All fire ground ladders shall be inspected, tested, and maintained in accordance with the requirements of NFPA Standard 1932, 1984 edition. To include tentative interim amendment 1932-84-2.

Note 1: Hardness testing and eddy current NDE testing is not required in the fire department annual maintenance inspection unless the individual ladder has been subjected to a high heat exposure which could have annealed the metal and diminished the structural integrity. The ladder manufacturer's recommendations should be followed with respect to hardness and eddy current testing.

Note 2: Testing should follow the recommended procedures taught by Washington state fire service training.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-305-100, filed 7/6/88. Statutory Authority: RCW 49.17-.040 and 49.17.050. 83-24-013 (Order 83-34), § 296-305-100, filed 11/30/83; Order 77-20, § 296-305-100, filed 10/18/77 and Emergency Order 77-24, filed 11/17/77, effective 12/17/77.]

[1988 WAC Supp—page 1966]

WAC 296-305-9901 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-305-9902 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-305-9903 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-305-9904 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-305-9905 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-305-9906 Repealed. See Disposition Table at beginning of this chapter.

Chapter 296-306 WAC SAFETY STANDARDS FOR AGRICULTURAL CODE

WAC

296-306-003	Subsections, subdivisions, items, subitems, and segments.
296-306-005	Repealed.
296-306-006	Equipment approval by nonstate agency or organization.
296-306-009	Equipment whether or not owned by, or under control of the employer.
296-306-010	Purpose and scope.
296-306-012	Definitions applicable to all sections of this chapter.
296-306-025	Management's responsibility.
296-306-057	Hand tools.
296-306-085	Fire protection and ignition sources.
296-306-090	Storage and handling of anhydrous ammonia.
296-306-27095	Exhibit B—Figures V-1 through V-28.
296-306-300	Field sanitation—Scope.
296-306-310	Field sanitation—Definitions.
296-306-320	Field sanitation—Requirements.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-306-005	Foreword. [Order 75-2, § 296-306-005, filed 1/24/75.] Repealed by 87-09-079 (Order 86-46), filed 4/22/87. Statutory Authority: RCW 49.17.040 and 49.17.050.
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WAC 296-306-003 Subsections, subdivisions, items, subitems, and segments. (1) That portion of section number appearing after the chapter designation appears in either a three digit or a five digit format (e.g., WAC 296-306-330 and 296-306-33002). The final two digits of the section number are implied decimal extensions of the first three digits and represent a further division of the three digit enumeration.

(2) Sections of this chapter may be divided into subsections (1), (2), (3), etc., which may in turn be divided into subdivisions (a), (b), (c), etc., which may be further divided into items (i), (ii), (iii), etc., which may be further divided into subitems (A), (B), (C), etc., which may

be further divided into segments (I), (II), (III), etc., all according to the following hierarchy, e.g.,

Sections	296-306-330 and 296-306-33002
Subsections	(1) (2)
Subdivisions	(a) (b)
Items	(i) (ii)
Subitems	(A) (B)
Segments	(I) (II)

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

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-09-079 (Order 86-46), § 296-306-003, filed 4/22/87.]

WAC 296-306-005 Repealed. See Disposition Table at beginning of this chapter.

WAC 296-306-006 Equipment approval by nonstate agency or organization. Whenever a provision of this chapter states that only that equipment or those processes approved by an agency or organization other than the department of labor and industries, such as the Underwriters Laboratories or the Bureau of Mines, shall be utilized, that provision shall be construed to mean that approval of such equipment or process by the designated agency or group shall be prima facie evidence of compliance with the provisions of this chapter.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-09-079 (Order 86-46), § 296-306-006, filed 4/22/87.]

WAC 296-306-009 Equipment whether or not owned by, or under control of the employer. (1) It is the employer's responsibility to ensure that any defective equipment or tools are not used.

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

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-09-079 (Order 86-46), § 296-306-009, filed 4/22/87.]

WAC 296-306-010 Purpose and scope. (1) The standards in this chapter apply to all agricultural operations with one or more employees, when such employees are covered by the Washington Industrial Safety and Health Act (WISHA).

(2) In the event that the provisions of this chapter conflict with the provisions contained in any other chapter of Title 296 WAC, this chapter shall prevail. Sections of other chapters 296-24 WAC apply only when specifically referenced in this chapter.

(3) When employees are assigned to perform tasks other than those directly related to agricultural operations, the proper chapter of Title 296 WAC shall apply.

(4) The air contaminant standards contained in WAC 296-62-073 through 296-62-07389 and 296-62-075 do not apply to chapter 296-306 WAC, Safety standards for agricultural code.

Note: Such assignments may involve logging, mining, sawmills, etc., when the products of such activities are removed from the farm site for commercial distribution.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-306-010, filed 7/6/88. Statutory Authority: RCW 49.17.040, 49.17.150, and 49.17.240. 79-08-115 (Order 79-9), § 296-306-010, filed 7/31/79; Order 75-2, § 296-306-010, filed 1/24/75.]

WAC 296-306-012 Definitions applicable to all sections of this chapter.

Note: Meaning of words. Unless the context indicates otherwise, words used in this chapter shall have the meaning given in this section.

(1) "Approved" means approved by the director of the department of labor and industries or his authorized representative: *Provided, however,* That should a provision of this chapter state that approval by an agency or organization other than the department of labor and industries is required, such as Underwriters' Laboratories or the Bureau of Mines, the provisions of WAC 296-24-006 shall apply.

(2) "Authorized person" means a person approved or assigned by the employer to perform a specific type of duty or duties or to be at a specific location or locations at the job site.

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

(4) "Department" means the department of labor and industries.

(5) "Director" means the director of the department of labor and industries, or designated representative.

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

(7) "Hazard" means that condition, potential or inherent, which can cause injury, death, or occupational disease.

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

(9) "Shall" or "must" means mandatory.

(10) "Should" or "may" means recommended.

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

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

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

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

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

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-09-079 (Order 86-46), § 296-306-012, filed 4/22/87.]

WAC 296-306-025 Management's responsibility. It shall be the responsibility of management to maintain and supervise:

- (1) A safe and healthful working environment.
- (2) An accident prevention program as required by these standards.
- (3) A system for reporting and recording accidents that will fulfill statistical requirements of the department of labor and industries. (See chapter 296-27 WAC.)

(4) Safety education and training programs.

(5) Temporary labor camps, as prescribed in WAC 296-24-125 through 296-24-12523, and shall comply with these rules and regulations.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-09-079 (Order 86-46), § 296-306-025, filed 4/22/87. Statutory Authority: RCW 49.17.040, 49.17.150 and 49.17.240. 79-08-115 (Order 79-9), § 296-306-025, filed 7/31/79; Order 77-12, § 296-306-025, filed 7/11/77; Order 75-2, § 296-306-025, filed 1/24/75.]

WAC 296-306-057 Hand tools. (1) Hoes with handles less than four feet in length or any hand tool used for weeding or thinning crops, when used in a stooped position, are prohibited.

- (2) Hand tools shall be kept in good condition.
- (3) Hand tools shall be safely stored when not in use.
- (4) Hand tools which are unsafe or defective shall not be used.

Note: When there is no other practical or adequate alternative, the director of the department of labor and industries, or his authorized representative may permit a variance pursuant to procedures prescribed by chapter 80, Laws of 1973, RCW 49.17.080 and 49.17.090 and chapter 296-350 WAC.






[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-09-079 (Order 86-46), § 296-306-057, filed 4/22/87.]

WAC 296-306-085 Fire protection and ignition sources. (1) Portable fire extinguishers shall be constructed, tested, maintained and used in accordance with the recommendations specified by the National Fire Protection Association's No. 10A-1970.

Note: The supplier of the extinguisher or local fire official can furnish this information.

- (2) Fire extinguishing equipment suitable for use for the type or types of fire which could be expected in an area shall be provided and shall be available at all times.
- (3) Each person who is expected to use fire extinguishing equipment shall be instructed as to its proper use.
- (4) Employees shall be instructed on procedures to be followed in case of fire.
- (5) Areas where fire or explosion hazards exist shall be posted with NO SMOKING or other suitable signs which warn of such hazards.
- (6) Vaporizing type extinguishers shall not be used.

KNOW YOUR FIRE EXTINGUISHERS

	WATER TYPE				FOAM	CARBON DIOXIDE	DRY CHEMICAL			
	STORED PRESSURE	CARTRIDGE OPERATED	WATER PUMP TANK	SODA ACID			SODIUM OR POTASSIUM BICARBONATE	MULTI-PURPOSE ABC		
CLASS A FIRES  WOOD, PAPER, TRASH HAVING GLOWING EMBERS	YES	YES	YES	YES	YES	NO <small>(BUT WILL CONTROL SMALL SURFACE FIRES)</small>	NO <small>(BUT WILL CONTROL SMALL SURFACE FIRES)</small>	NO <small>(BUT WILL CONTROL SMALL SURFACE FIRES)</small>	YES	YES
CLASS B FIRES  FLAMMABLE LIQUIDS, GASOLINE, OIL, PAINTS, GREASE, ETC.	NO	NO	NO	NO	YES	YES	YES	YES	YES	YES
CLASS C FIRES  ELECTRICAL EQUIPMENT	NO	NO	NO	NO	NO	YES	YES	YES	YES	YES
CLASS D FIRES  COMBUSTIBLE METALS	SPECIAL EXTINGUISHING AGENTS APPROVED BY RECOGNIZED TESTING LABORATORIES									
METHOD OF OPERATION	PULL PIN - SQUEEZE HANDLE	TURN UPSIDE DOWN AND BUMP	PUMP HANDLE	TURN UPSIDE DOWN	TURN UPSIDE DOWN	PULL PIN - SQUEEZE LEVER	RUPTURE CARTRIDGE - SQUEEZE LEVER	PULL PIN - SQUEEZE HANDLE	PULL PIN - SQUEEZE HANDLE	RUPTURE CARTRIDGE - SQUEEZE LEVER
RANGE	30' - 40'	30' - 40'	30' - 40'	30' - 40'	30' - 40'	3' - 8'	5' - 20'	5' - 20'	5' - 20'	5' - 20'
MAINTENANCE	CHECK AIR PRESSURE GAUGE MONTHLY	WEIGH GAS CARTRIDGE ADD WATER IF REQUIRED ANNUALLY	DISCHARGE AND FILL WITH WATER ANNUALLY	DISCHARGE ANNUALLY - RECHARGE	DISCHARGE ANNUALLY - RECHARGE	WEIGH SEMI-ANNUALLY	WEIGH GAS CARTRIDGE - CHECK CONDITION OF DRY CHEMICAL ANNUALLY	CHECK PRESSURE GAUGE AND CONDITION OF DRY CHEMICAL ANNUALLY	CHECK PRESSURE GAUGE AND CONDITION OF DRY CHEMICAL ANNUALLY	WEIGH GAS CARTRIDGE - CHECK CONDITION OF DRY CHEMICAL ANNUALLY

Note: The above department of labor and industries chart on special extinguishing agents approved by recognized testing laboratories is set forth as filed in the office of the code reviser. It is available for inspection in the code reviser's office as well as the department of labor and industries.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-306-085, filed 7/6/88; Order 75-2, § 296-306-085, filed 1/24/75.]

WAC 296-306-090 Storage and handling of anhydrous ammonia. (1) Any agricultural employer or employee who transports or applies anhydrous ammonia shall obtain and comply with the anhydrous ammonia safety rules (WAC 296-24-51019 through 296-24-51021). These may be obtained from the department of labor and industries, division of industrial safety and health.

(2) Gloves and goggles and/or a face shield shall be used by all employees while working on or with charged anhydrous ammonia equipment.

(3) Equipment shall be inspected before each day's work. Conditions that would contribute to accidental leakage shall be corrected.

(4) Hose end-valves must be in a closed position when not in use to prevent accidental discharge in case the main valve is opened.

(5) Five gallons or more of clean water must be provided on the equipment.

(6) Relief and vapor valves shall be positioned to discharge away from operator's working position.

[Statutory Authority: Chapter 49.17 RCW. 88-14-108 (Order 88-11), § 296-306-090, filed 7/6/88; Order 75-2, § 296-306-090, filed 1/24/75.]

WAC 296-306-27095 Exhibit B—Figures V-1 through V-28.

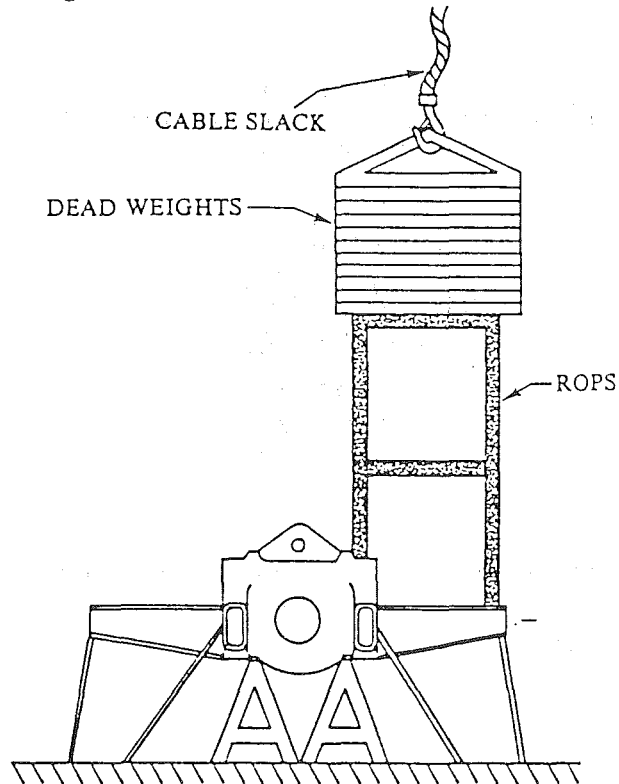


Figure V-1
Vertical loading setup for all types of equipment described in WAC 296-306-270.

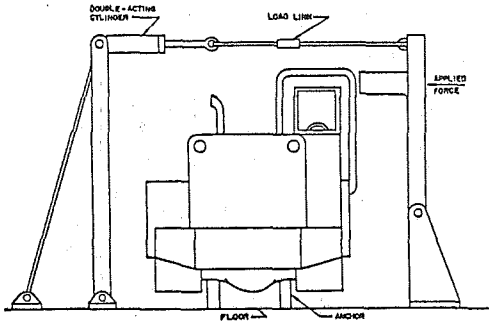
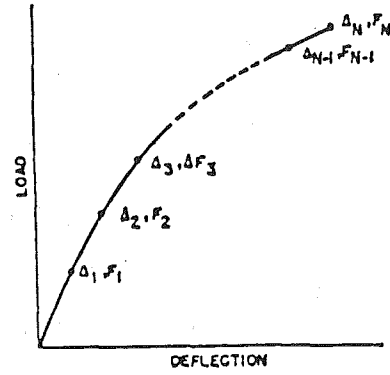


Figure V-2
Test setup for rubber-tired self-propelled scrapers.



Δ - TOTAL DEFLECTION
F - FORCE APPLIED

$$AREA = \frac{\Delta_1 F_1}{2} + (\Delta_2 - \Delta_1) \frac{F_1 + F_2}{2} + (\Delta_3 - \Delta_2) \frac{F_2 + F_3}{2} + \dots + (\Delta_N - \Delta_{N-1}) \frac{F_{N-1} + F_N}{2}$$

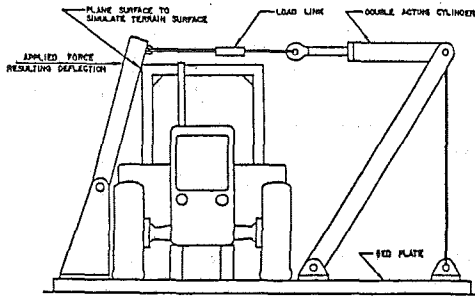


Figure V-3
Test setup for rubber-tired front-end loaders, rubber-tired dozers, and motor graders.

Figure V-5
Determination of energy area under force deflection curve.

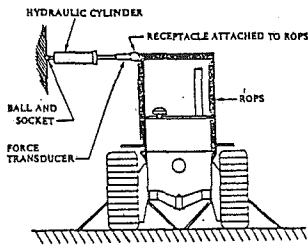


Figure V-4
Side-loading setup for crawler tractors and crawler loaders.

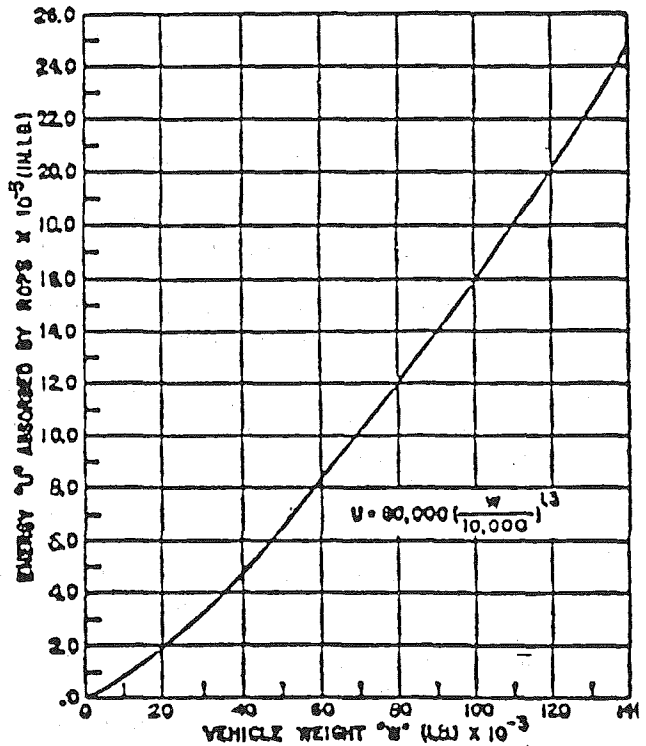


Figure V-6
Energy absorbed versus vehicle weight.

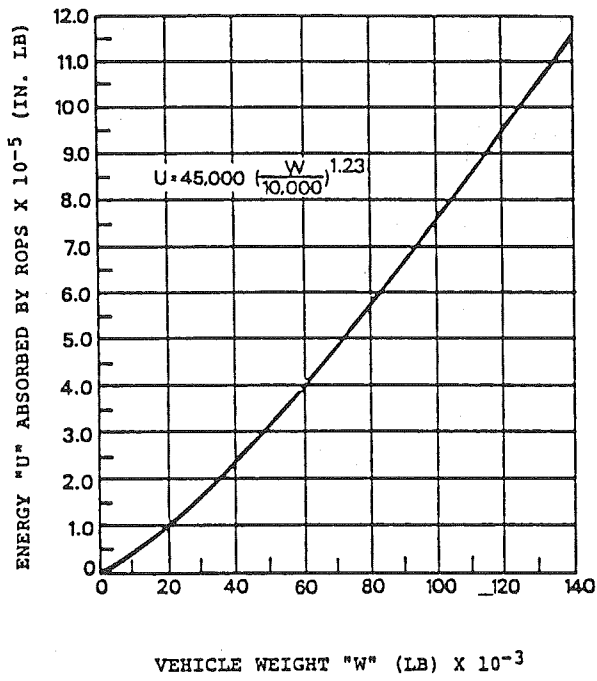


Figure V-7
Energy absorbed versus vehicle weight.

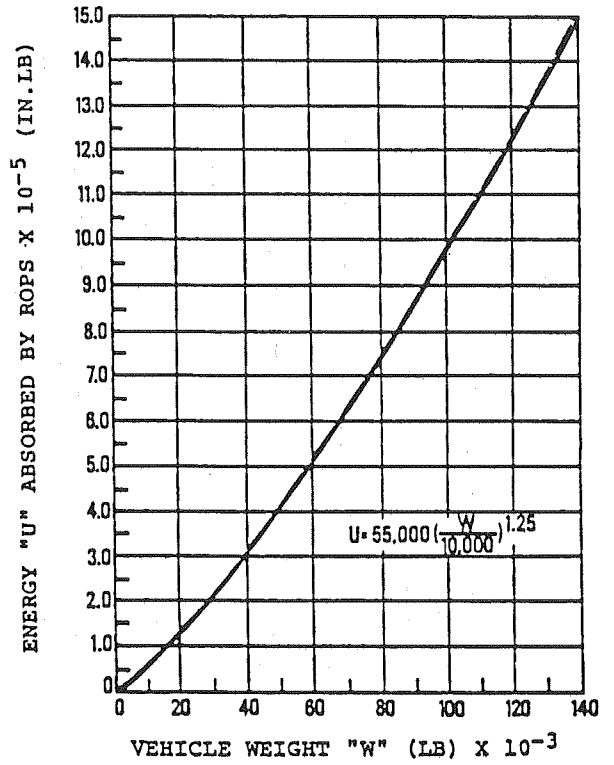


Figure V-9
Energy absorbed versus vehicle weight.

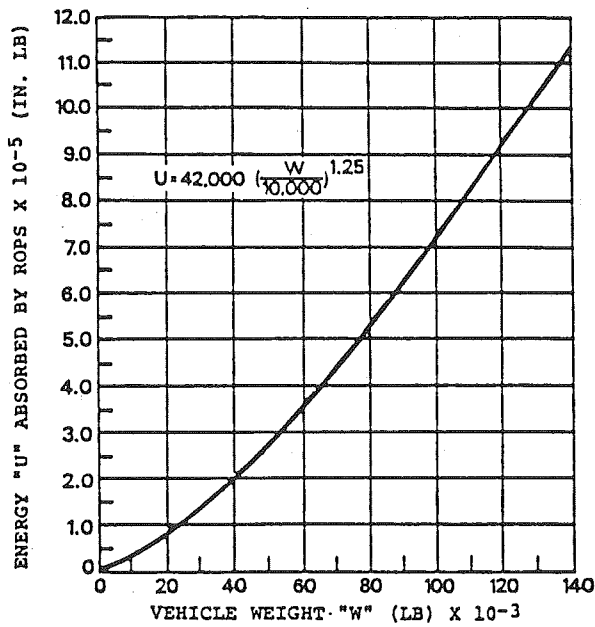


Figure V-8
Energy absorbed versus vehicle weight.

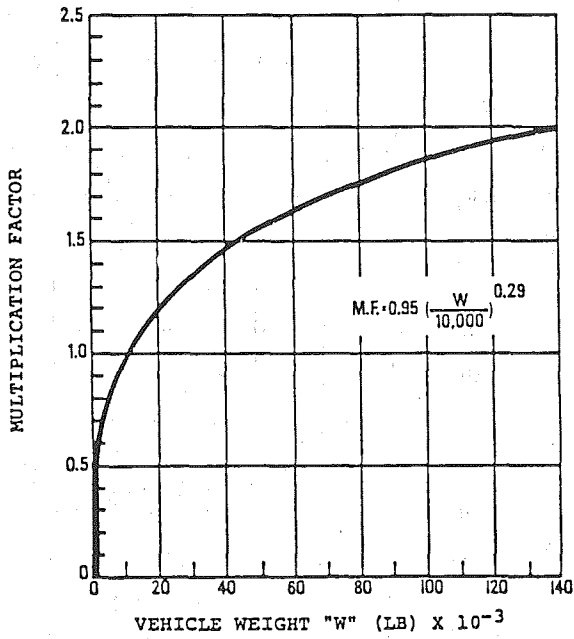


Figure V-10
Minimum horizontal load factor for self-propelled scrapers.

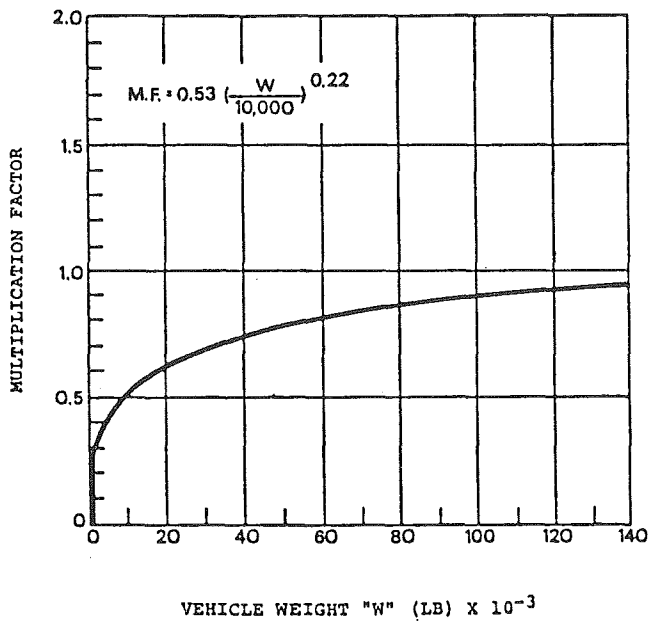


Figure V-11
Minimum horizontal load factor for rubber-tired loaders and dozers.

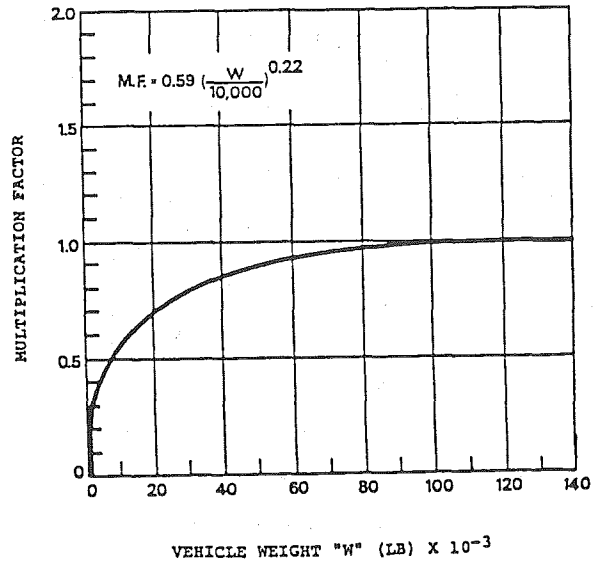


Figure V-12
Minimum horizontal load factor for crawler tractors and crawler-type loaders.

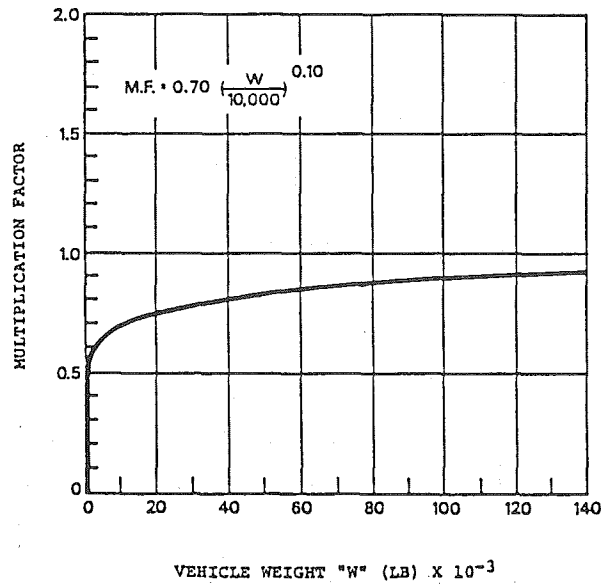


Figure V-13
Minimum horizontal load factor for motor graders.

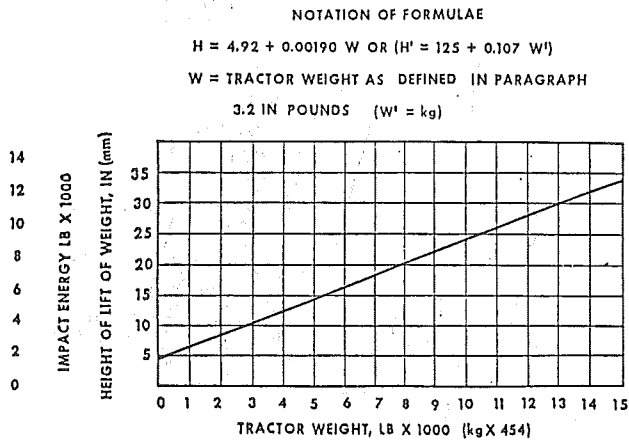


Figure V-14
Impact energy and corresponding lift height of 4,410 lb.
(2,000 kg.) weight.

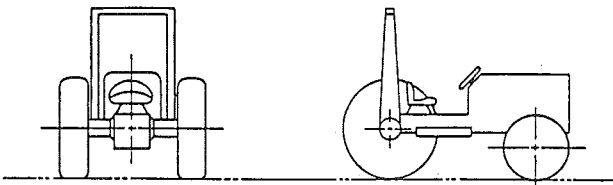


Figure V-15
Typical frame configuration.

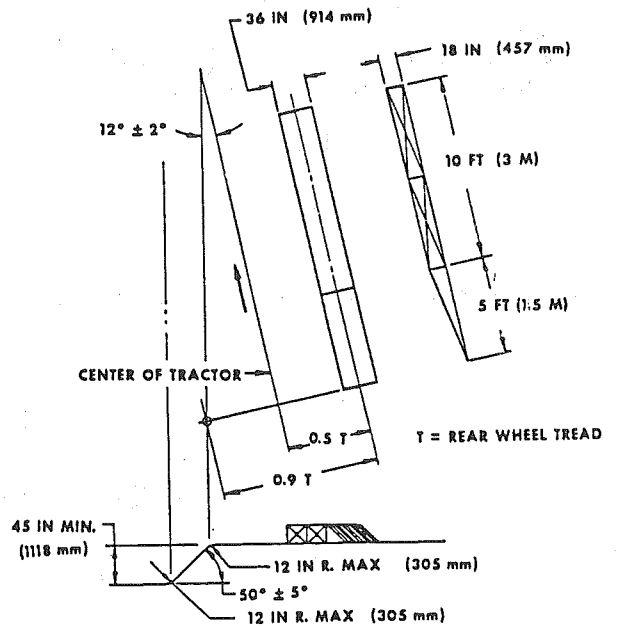


Figure V-16
Bank and ramp configuration for side overturn testing.

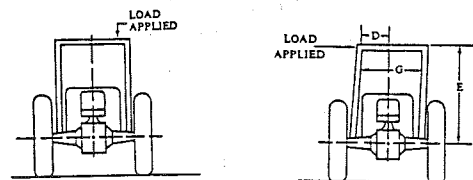


Figure V-17
Side load application.

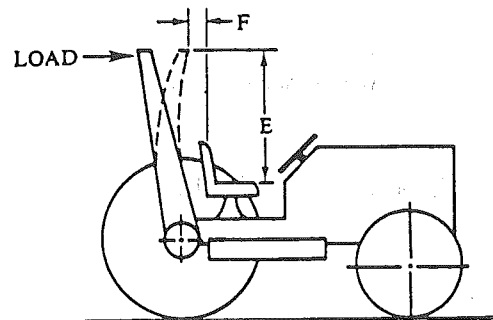


Figure V-18
Rear load application.

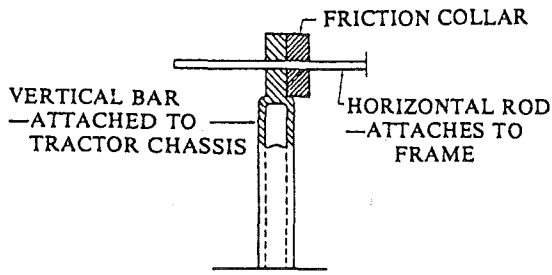


Figure V-19
 Method of measuring instantaneous deflection.

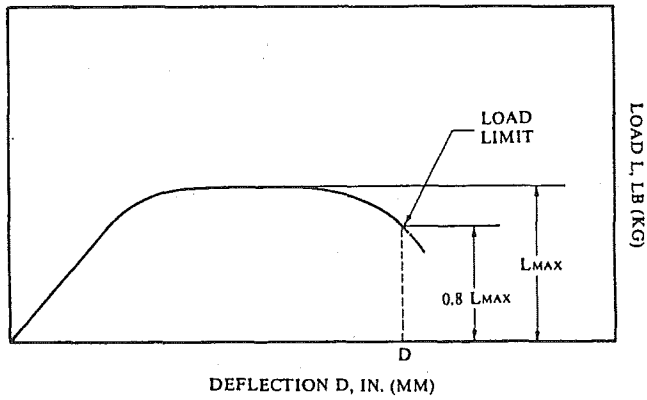


Figure V-20
 Typical L-D diagram.

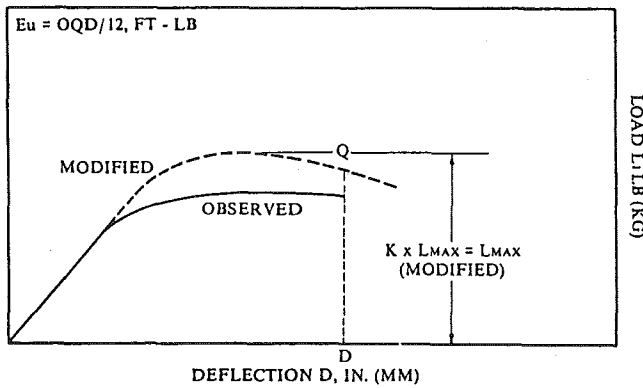


Figure V-21
 Typical modified L_m - D_m diagram.

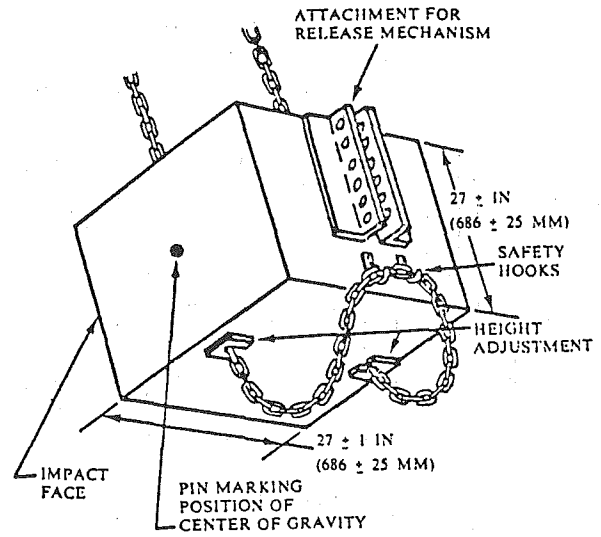


Figure V-22
 Pendulum.

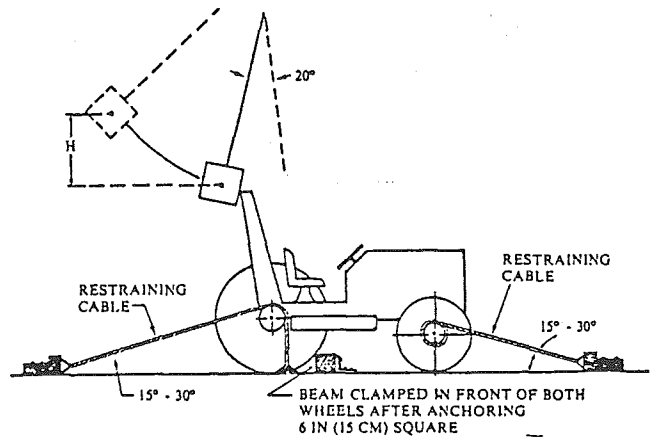


Figure V-23
 Method of impact from rear.

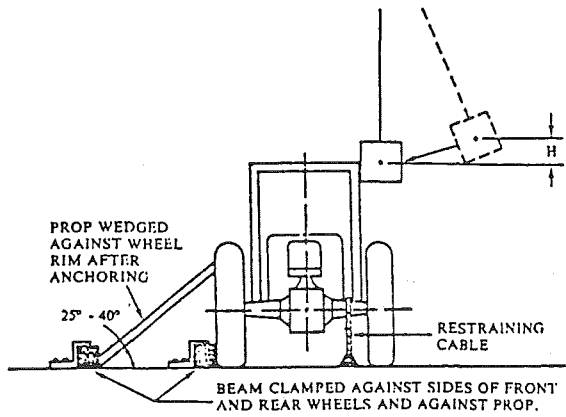


Figure V-24
Method of impact from side.

ALL POSSIBLE LATERAL
WORKING POSITIONS OF
SEAT

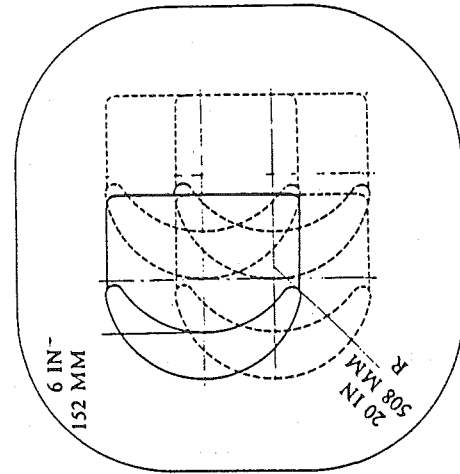


Figure V-26
Zone of protection for drop test.

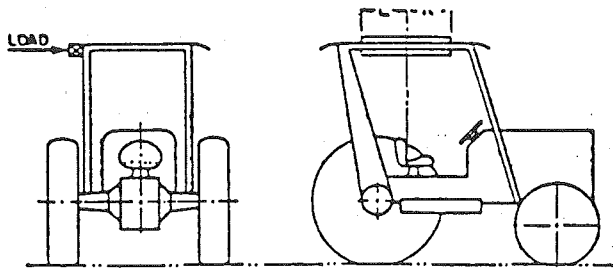


Figure V-25
Location for side load.

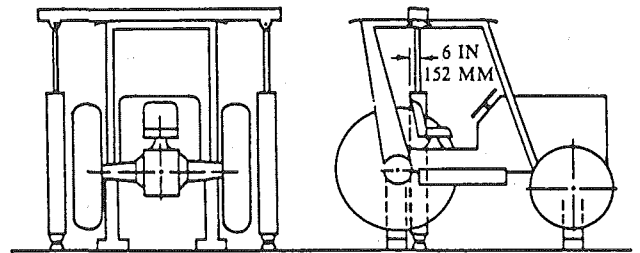


Figure V-27
Method of load application for crush test.

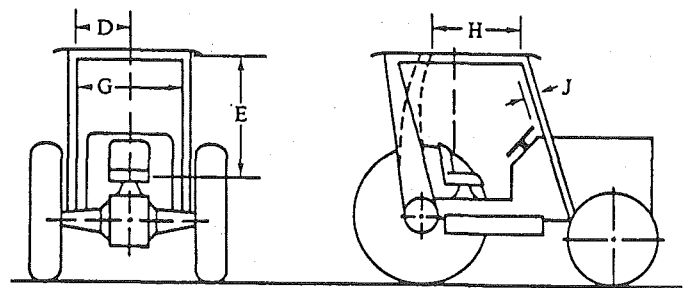


Figure V-28
Protected zone during crush and drop tests.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-306-27095, filed 11/30/87; Order 76-28, Exhibit B (codified as WAC 296-306-27095), filed 9/28/76.]

WAC 296-306-300 Field sanitation--Scope. WAC 296-306-300 through 296-306-320 shall apply to any agricultural establishment where one or more employees are engaged on any given hand-labor operations in the field. Except that WAC 296-306-320(3) (Handwashing facilities) and 296-306-320(4) (Toilet facilities) do not apply to employers of workers who:

- (1) Are engaged in field activities for the production of grains, seeds, livestock, or livestock feed; or
- (2) Use vehicles, machinery, or animals as part of their field activities and, when needed, can transport themselves to and from toilet and handwashing facilities.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-09-079 (Order 86-46), § 296-306-300, filed 4/22/87.]

WAC 296-306-310 Field sanitation--Definitions.

(1) "Agricultural employer" means any person, corporation, association, or other legal entity that owns or operates an agricultural establishment or on whose premises or in whose interest an agricultural establishment is operated and any person, corporation, association, or other legal entity who is responsible for the management and condition of an agricultural establishment or who acts directly or indirectly in the interest of an employer in relation to any employee.

(2) "Agricultural establishment" is a business operation that uses paid employees in the production of food, fiber, or other materials such as seed, seedlings, plants, or parts of plants.

(3) "Accessible" means no more than one-fourth mile or five minutes travel time from the work location served.

(4) "Hand-labor operations" means agricultural activities or operations performed by hand or with hand tools. Some examples of "hand-labor operations" are the hand harvest of vegetables, nuts, fruit, hand weeding of crops, and hand planting of seedlings. "Hand-labor" does not include such activities as logging operations, the care or feeding of livestock, or hand-labor operations in permanent structures (e.g., canning facilities or packing houses).

(5) "Handwashing facility" means a facility providing a tap with an adequate supply of water, approved by the local health authority. Soap, single-use hand towels and either a basin or other suitable container for washing shall be provided.

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

(7) "Toilet" means a facility designed for the purpose of both defecation and urination, including biological or chemical toilets, combustion toilets, or sanitary privies. Toilets may be either fixed or portable.

[Statutory Authority: RCW 49.17.040 and 49.17.050. 87-09-079 (Order 86-46), § 296-306-310, filed 4/22/87.]

WAC 296-306-320 Field sanitation--Requirements. Agricultural employers shall provide the following for employees engaged in hand-labor operations in the field, without cost to the employee:

(1) Orientation: Orientation shall be given verbally to all employees in a manner readily understandable by each employee and shall include:

(a) Potable water: The location(s) of potable water supplies;

(b) Nonpotable water: Identification of all nonpotable water at the worksite and prohibition of the use of nonpotable water with an explanation of the possible consequences of using nonpotable water;

(c) Handwashing facilities: The location(s) of handwashing facilities with an explanation of when they should be used and the consequences of nonuse; and

(d) Toilet facilities: The location(s) of toilet facilities with an explanation of the necessity to use them and to keep them sanitary as well as the possible consequences of nonuse.

(2) Potable drinking water.

(a) The water shall be provided and shall be placed in locations readily accessible to all employees.

(b) Potable water dispensers shall be designed, constructed, and serviced so that sanitary conditions are maintained. They shall be capable of being closed and shall be equipped with a tap.

(c) 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.

(d) Marking: Any container used to distribute drinking water shall be clearly marked, in English and with appropriate international symbol as to the nature of its contents.

(e) Use: Any container used to distribute drinking water shall not be used for any other purpose.

(f) The water shall be suitably cool and 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, workers may require up to three gallons of water per day.

(g) The use of common drinking cups or dippers is prohibited. Water shall be dispensed in single-use drinking cups, personal containers, or by water fountains. Single-use drinking cups mean a container of any type or size whether disposable or not, and may include personal containers so long as the option to use a personal container is exercised by the employee, not the employer.

(h) Employees shall not be permitted to drink from irrigation ditches, creeks or rivers. Potable water shall meet the standards for drinking purposes by the state or local authority having jurisdiction or water that meets the quality standards prescribed by the local health department in accordance with the United States Environmental Protection Agency's National Interim Primary Drinking Water Regulations, published in 40 CFR Part 141.

(3) Handwashing facilities.

(a) One handwashing facility, providing a tap with an adequate supply of water, soap, single-use hand towels and either a basin or other suitable container for washing shall be provided for each thirty employees or fraction thereof, except as stated in (h)(ii) of this subsection.

Note: Nonpotable water shall not be used for washing any portion of the person, except as specifically permitted by the health authorities having jurisdiction.

(b) Running water: Each facility shall be provided with running water.

(c) Soap: Each facility shall be provided with a dispenser containing handsoap or a similar cleansing agent.

(d) Towels: Each facility shall be provided with individual single-use hand towels.

(e) Cleanliness: Facilities shall be maintained in a clean and sanitary condition in accordance with appropriate public health sanitation practices.

(f) Waste: Waste receptacles shall be provided. Disposal of wastes from the facilities shall not create a hazard or cause an unsanitary condition.

(g) Reasonable use: Employees shall be allowed reasonable opportunities during the work period to use the facilities.

(h) Location:

(i) Facilities shall be accessibly located in close proximity to toilet facilities and within one-quarter mile of each employee's place of work in the field.

(ii) Where it is not feasible to locate facilities within one-quarter mile, or where facilities are otherwise inaccessible, suitable immediate transportation shall be provided within five minutes transportation time, to facilities meeting the requirements of this subsection. Under exceptional and compelling circumstances, such as adverse weather, temperatures below freezing, or isolated terrain, longer transportation times may be used.

(4) Toilet facilities.

(a) One toilet facility shall be provided for each thirty employees or fraction thereof, except as stated in (h)(ii) of this subsection.

(b) Each employer shall 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 shall be taken. Inspections shall be documented and the record shall be maintained at the work site for at least seventy-two hours.

(c) Toilet facilities shall have doors that can be closed and latched from the inside and shall be constructed to ensure privacy.

(d) Cleanliness: Facilities shall be maintained in a clean, sanitary, and functional condition and in accordance with the appropriate public health sanitation practices.

(e) Toilets shall be supplied with toilet paper.

(f) Waste: Disposal of wastes from the facilities shall not create a hazard or cause an unsanitary condition.

(g) Reasonable use: Employees shall be allowed reasonable opportunities during the work period to use the facilities.

(h) Location:

(i) Facilities shall be accessibly located in close proximity to hand washing facilities and within one-quarter mile of each employee's place of work in the field.

(ii) Where it is not feasible to locate facilities within one-quarter mile, or where facilities are otherwise inaccessible, suitable immediate transportation shall be provided within five minutes transportation time, to facilities meeting the requirements of this subsection. Under exceptional and compelling circumstances, such as adverse weather, temperature below freezing, or isolated terrain, longer transportation times may be used.

[Statutory Authority: Chapter 49.17 RCW. 88-23-054 (Order 88-25), § 296-306-320, filed 11/14/88. Statutory Authority: RCW 49.17.040 and 49.17.050. 87-09-079 (Order 86-46), § 296-306-320, filed 4/22/87.]

Chapter 296-350 WAC

REASSUMPTION OF JURISDICTION PURSUANT TO RCW 49.17.140

WAC

296-350-500 Citation and notice—Copy to employee representative.

296-350-990 Appendix A—Form F418-023-000—Application for copies of citations and notices.

WAC 296-350-500 Citation and notice—Copy to employee representative. (1) RCW 49.17.120 provides in pertinent part

"The director shall provide by rule for procedures to be followed by an employee representative upon written application to receive copies of CITATIONS AND NOTICES issued to any employer having employees who are represented by such employee representative. Such rule may prescribe the forms of such application, the time for renewal of applications, and the eligibility of the applicant to receive copies of CITATIONS AND NOTICES."

(2) "Employee representative" means:

(a) Any officer of the recognized bargaining agent of employees, acting on behalf of the employees of the employer.

(b) Any employee representative of an employer-employee safety committee within an establishment or the firm of the employer.

(c) Any employee of an employer who has been selected by the employees of that employer to act as their representative for the purposes indicated in subsection (1) of this section. Such selection shall be evidenced by a letter or other written communication to the division of industrial safety and health stating the name of the employee so selected and signed by not less than one-half of the employees of the employer so represented.

(3) An employee representative may receive copies of CITATIONS AND NOTICES issued to any employer having employees who are represented by such employee representative upon the filing of a complete application Form F418-023-000, a facsimile of which constitutes Appendix A of this section, with the division of industrial

safety and health, Department of Labor and Industries, Olympia, Washington 98504.

(4) In the event that the director or his/her authorized representative finds that application for copies of the CITATION AND NOTICE have been received by more than one employee representative of the same employees of the employer, the director or his/her authorized representative may elect which of the applicants to which the copies of the CITATION AND NOTICE shall be sent.

(5) The director or his/her authorized representative may deny an application for copies of CITATIONS AND NOTICES upon finding that the applicant is not an employee representative as defined in subsection (2) of this section or upon finding that more than one employee representative of the same employees has applied for copies of CITATIONS AND NOTICES.

(6) An application for copies of CITATIONS AND NOTICES may be granted for a period not exceeding one year and may be renewed upon re-application for another one year period. The director or his/her authorized representative may, at the request of the applicant, waive the one year limitation.

(7) Upon the granting of the application for copies of CITATIONS AND NOTICES, the applicant shall be informed of the granting and of the date on which that grant shall expire.

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-350-500, filed 11/30/87. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-500, filed 11/13/80; Order 75-14, § 296-350-500, filed 4/14/75.]

WAC 296-350-990 Appendix A--Form F418-023-000--Application for copies of citations and notices.

APPENDIX A

DEPT. OF LABOR & INDUSTRIES
Div. of Industrial Safety & Health
P.O. Box 207
Olympia, WA 98504

APPLICATION FOR COPIES OF CITATION AND NOTICES
ISSUED PURSUANT TO THE WASHINGTON INDUSTRIAL SAFETY AND HEALTH ACT

Any employee of an employer who has been selected by the employees of that employer to act as their representative as defined in WAC 296-350-500 may apply for copies of CITATION AND NOTICES issued to said employer.

DEFINITION:

WAC 296-350-500(2) - "Employee representative" means:

- (a) Any officer of the recognized bargaining unit of employees, acting on behalf of the employees of the employer.
(b) Any employee representative of an employer-employee safety committee within an establishment of the firm of the employer.
(c) Any employee of an employer who has been selected by the employees of that employer to act as their representative for the purposes indicated in subsection (1) of this section. Such selection shall be evidenced by a letter or other written communication to the Division of Industrial Safety and Health stating the name of the employee so selected and signed by not less than one-half of the employees of the employer.

Applicant certifies he/she is an employee representative by virtue of WAC 296-350-500(2)

CERTIFICATION: I HEREBY CERTIFY UNDER PENALTY OF PERJURY THAT THE ABOVE STATEMENT IS TRUE TO THE BEST OF MY KNOWLEDGE.

Table with 3 columns: Signature, position, date

Name and address of applicant to which copies of CITATION AND NOTICES should be sent:

Name, address and Labor & Industries account I.D. and/or Unified Business Identifier of EMPLOYER HAVING EMPLOYEES WHO ARE REPRESENTED by the applicant (please give full information for each employer you represent - use extra paper if required):

The director or his/her authorized representative may deny this application if more than one employee representative has applied or if the applicant does not qualify as an employee representative.

For Department Use Only
Application Rcvd.
Applicant Notified
Comment:
Application Granted by
Expiration Date
Date Application Granted

F418-023-000 app for copies of citation and notice 4-87 (Wish 300)

[Statutory Authority: Chapter 49.17 RCW. 87-24-051 (Order 87-24), § 296-350-990, filed 11/30/87. Statutory Authority: RCW 49.17.040, 49.17.050, 49.17.240, chapters 42.30 and 43.22 RCW. 80-17-014 (Order 80-20), § 296-350-990, filed 11/13/80; Order 75-14, Appendix A—Form 300 (codified as WAC 296-350-990), filed 4/14/75.]

Chapter 296-400 WAC

CERTIFICATION OF COMPETENCY FOR
JOURNEYMAN PLUMBERS

WAC
296-400-045 Plumber examination, certification, reinstatement,
and temporary permit fees.

WAC 296-400-045 Plumber examination, certification, reinstatement, and temporary permit fees.

Examination fee: \$100.00

Trainee certificate fee
(1 year): \$20.00

Issuance of trainee certificate for less than 1 year: \$ 2.00 for each month
of certificate period
with a minimum fee
of \$10.00

The trainee certificate shall expire one year from the date of issuance, and shall be renewed on or before the date of expiration.

Temporary permit fee: \$20.00

Issuance or renewal of journeyman or specialty certificate fee (2 year): \$60.00

Issuance of certificate for less than two years: \$ 2.50
for each month of
certificate period
with a minimum fee
of \$20.00

Reinstatement of journeyman or specialty certificate: \$60.00

Replacement of all certificates: \$20.00

Each person who has passed the examination for the plumbers certificate of competency and has paid the certificate fee shall be issued a certificate of competency that will expire on his or her birthdate. If the person was born in an even-numbered year, the certificate shall expire on the person's birthdate in the next even-numbered year. If the person was born in an odd-numbered year, the certificate shall expire on the person's birthdate in the next odd-numbered year.

[Statutory Authority: RCW 18.106.125. 88-06-037 (Order 87-32), § 296-400-045, filed 2/29/88. Statutory Authority: Chapter 18.106 RCW. 86-19-083 (Order 86-30), § 296-400-045, filed 9/17/86. Statutory Authority: RCW 18.106.140 and 1983 c 124 § 10. 83-19-044 (Order 83-26), § 296-400-045, filed 9/16/83.]

[1988 WAC Supp—page 1980]

Chapter 296-401 WAC

CERTIFICATION OF COMPETENCY FOR
JOURNEYMAN ELECTRICIANS

WAC

296-401-030 Issuing of temporary permits.
296-401-080 Eligibility for journeyman examination.
296-401-085 Eligibility for specialty examination.
296-401-087 Partial credit for experience.
296-401-090 Status of person who has failed an examination for an electrician certificate of competency.
296-401-100 Computation of years of employment—Renewal of training certificates.
296-401-120 Electrical training certificates.
296-401-170 Hearing or appeal procedure.
296-401-180 Examination subjects for specialty and journeyman certificates of competency.

WAC 296-401-030 Issuing of temporary permits.

(1) The department will issue to an applicant who meets the eligibility requirements of RCW 19.28.530, one out-of-state temporary permit during the period of time between filing an application to take the next certification examination and the date the results of the examination are furnished to the applicant.

If the applicant with a temporary permit does not appear for the examination the applicant has been scheduled for, the permit will expire on the expiration date specified on the permit.

(2) The department will issue a second temporary certificate of competency to an applicant for a period of ninety days or less only if the applicant furnishes evidence to the department of enrollment in an electrician training or refresher course which has been approved by the electrical board.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-401-030, filed 7/21/88. Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 86-18-041 (Order 86-23), § 296-401-030, filed 8/29/86. Statutory Authority: RCW 19.28.120 and 19.28.510. 83-23-053 (Order 83-32), § 296-401-030, filed 11/14/83; Order 74-12, § 296-401-030, filed 4/15/74; Order 73-21, § 296-401-030, filed 11/5/73.]

WAC 296-401-080 Eligibility for journeyman examination.

A person holding an electrical training certificate who has: (1) Been employed under the direct supervision of a journeyman electrician for four years, or (2) has completed a four year apprenticeship program in the electrical construction trade that is registered with the state apprenticeship council or the Federal Bureau of Apprenticeship and Training, or (3) is a graduate of a trade school program in the electrical construction trade that was established during 1946, shall be eligible to take the examination for a journeyman certificate of competency. A person who has had two years of schooling under the conditions provided in RCW 19.28.530 in addition to two years of employment under the direct supervision of a journeyman electrician shall be eligible to take the examination for a journeyman certificate of competency.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-401-080, filed 7/21/88. Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 86-18-041 (Order 86-23), § 296-401-080, filed 8/29/86. Statutory Authority: RCW 19.28.060. 81-06-037 (Order 81-5), § 296-401-080, filed 2/27/81, effective 4/1/81.

Statutory Authority: RCW 18.37.130. 80-02-052 (Order 80-1), § 296-401-080, filed 1/16/80.]

WAC 296-401-085 Eligibility for specialty examination. A person holding an electrical trainee certificate who has: (1) Been employed in the appropriate specialty under the direct supervision of a journeyman electrician or an appropriate specialty electrician for a minimum of two years, or (2) has completed a two year apprenticeship program in the electrical construction trade that is registered with the state apprenticeship council or the Federal Bureau of Apprenticeship and Training in the appropriate specialty, shall be eligible to take the examination for a specialty electrician certificate of competency.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-401-085, filed 7/21/88.]

WAC 296-401-087 Partial credit for experience.

(1) A person holding a journeyman electrician certificate in a country outside the United States of America that requires at least four years of training shall be granted two years credit toward a journeyman certificate. An additional two years training under the direct supervision of a journeyman electrician is necessary to qualify to take the journeyman electrician certificate of competency examination.

(2) A person who has two years or more training or experience in a specialized electrical field in the Armed Forces of the United States that is similar to, but not identical to, a specialty electrician category under WAC 296-401-060 shall be granted one year experience. An additional year of work experience in the appropriate specialty under the direct supervision of a journeyman or specialty electrician is necessary to qualify to take a specialty examination.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-401-087, filed 7/21/88.]

WAC 296-401-090 Status of person who has failed an examination for an electrician certificate of competency.

(1) A person who fails an examination for an electrician certificate of competency may take a training or refresher course that has been approved by the electrical board and may work in the electrical construction trade only if the person has a valid electrician training certificate or temporary permit. A person is eligible to retake an examination upon application and payment of applicable fees only upon satisfactory completion of an approved electrician training or refresher course.

(2) A person who has a training certificate and/or who is taking a refresher course shall work only under the supervision of a certificated electrician.

(3) Upon application, the department may issue an electrician training certificate to a person who has failed an examination for a certificate of competency, only if the person furnishes evidence of enrollment in an electrician training or refresher course which is approved by the electrical board. To be eligible to renew the training certificate, the person must furnish evidence of, (a) successfully completing the electrician training or refresher

course, and (b) failing the certificate of competency again.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-401-090, filed 7/21/88. Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 86-18-041 (Order 86-23), § 296-401-090, filed 8/29/86. Statutory Authority: RCW 18.37.130. 80-02-052 (Order 80-1), § 296-401-090, filed 1/16/80.]

WAC 296-401-100 Computation of years of employment—Renewal of training certificates. (1) For the purposes of RCW 19.28.530, 1800 hours of employment shall be considered one year of employment.

(2) At the time of renewal of an electrical training certificate, the holder shall provide the department with an accurate list of the holder's employers in the electrical industry for the previous year, the specialty the holder worked in and the number of hours worked for each employer in each specialty.

(3) The employer or apprenticeship program director shall upon request by the holder of the training certificate furnish an accurate list of the hours worked by the holder within twenty days of the request.

(4) A person who has completed a four year apprenticeship program in the electrical construction trade that is registered with the state apprenticeship council or the Federal Bureau of Apprenticeship and Training shall be considered to have completed 7200 hours (four years) of employment.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-401-100, filed 7/21/88. Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 86-18-041 (Order 86-23), § 296-401-100, filed 8/29/86. Statutory Authority: RCW 19.28.060. 81-06-037 (Order 81-5), § 296-401-100, filed 2/27/81, effective 4/1/81. Statutory Authority: RCW 18.37.130. 80-02-052 (Order 80-1), § 296-401-100, filed 1/16/80.]

WAC 296-401-120 Electrical training certificates.

(1) The department upon proper application and verification shall issue separate electrical training certificates for the first, second, third, and fourth years of training. If a person has 1800 hours of employment or less in the electrical construction trade, the department shall issue the individual a first year certificate; if more than 1800 through 3600 hours, a second year certificate; if more than 3600 through 5400 hours, a third year certificate; and if more than 5400 hours a fourth year certificate.

(2) A holder of an electrical training certificate may apply for the next year's certificate whenever he or she has sufficient hours of employment.

(3) A holder of an electrical training certificate may apply for authorization to work without supervision if he or she has over 6299 hours of employment, and has successfully completed or is currently enrolled in an approved apprenticeship program or in a technical school program in the electrical construction trade in a school approved by the superintendent of public instruction.

(4) The department shall not issue an electrical training certificate to a person who is eligible for a temporary or reciprocal electrician certificate of competency.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-401-120, filed 7/21/88. Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 86-18-041 (Order 86-23), § 296-

401-120, filed 8/29/86. Statutory Authority: RCW 18.37.130. 80-02-052 (Order 80-1), § 296-401-120, filed 1/16/80.]

WAC 296-401-170 Hearing or appeal procedure.

(1) An employer or employee to whom a citation or cease and desist order is directed; a person who is aggrieved by the department's suspension or revocation of a trainee, journeyman, or specialty certificate; or the denying an application to take an examination for a certificate; or a person who has had his or her hours reduced pursuant to WAC 296-401-150; may request a formal or informal hearing before the electrical board within fifteen days from receipt of the citation, cease and desist order, the suspension or revocation of a certificate, denial of an application, or the reduction of hours.

(2) The formal appeal shall be made in writing to the department chief electrical inspector and shall state the action by the department that is being appealed and the relief that is desired and shall be accompanied by a certified check in the amount of two hundred dollars made payable to the department. The deposit shall be returned to the aggrieved party if the decision of the department is not sustained or upheld. If the decision of the department is sustained or upheld, the deposit shall be used to pay the expenses of holding the hearing and any balance remaining after payment of the hearing expenses shall be paid into the electrical license fund. The formal appeal shall be assigned to an administrative law judge and shall be held in conformance with the requirements of the Administrative Procedure Act, chapter 34.04 RCW. Findings of fact, conclusions of law, and a decision are given as a result of a formal appeal.

(3) The electrical board will hear informal appeals from persons who desire to contest a decision of the department. Informal appeals will be heard by the board at a regular or special board meeting. An informal appeal shall be made in writing to the department chief electrical inspector and shall state the action by the department that is being appealed and the relief that is desired. An informal decision is given as a result of an informal appeal.

(4) See chapter 296-13 WAC for additional information on appeals before the electrical board.

[Statutory Authority: RCW 19.28.060. 88-16-002 (Order 88-15), § 296-401-170, filed 7/21/88. Statutory Authority: RCW 19.28.060, 19.28.600 and chapter 19.28 RCW. 86-18-041 (Order 86-23), § 296-401-170, filed 8/29/86. Statutory Authority: RCW 18.37.130. 80-02-052 (Order 80-1), § 296-401-170, filed 1/16/80.]

WAC 296-401-180 Examination subjects for specialty and journeyman certificates of competency. The following subjects are among those that may be included in the examination for a certificate of competency. The list is not exclusive, and the test may also contain subjects not in the list.

JOURNEYMAN ELECTRICIAN EXAMINATIONS MAY BE BASED ON THE SUBJECTS FOR SPECIALTY ELECTRICIAN EXAMINATIONS IN ADDITION TO THESE SUBJECTS:

AC - Generator; three-phase; meters; characteristics of; power in AC circuits (power factor); mathematics of AC circuits

Air conditioning - Basic

Blueprints - Surveys and plot plans; floor plans; service and feeders; Electrical symbols; elevation views; plan views

Building wire - Sizes

Cable trays

Calculations

Capacitive reactance

Capacitor - Types; in series and parallel

Circuits - Series; parallel; combination; basic; branch; outside branch circuits; calculations

Conductor - Voltage drop (line loss); grounded

Conduit - Wiring methods

DC - Generator; motors; construction of motors; meters

Definitions

Electrical units

Electron theory

Fastening devices

Fire alarms - Introduction to; initiating circuits

Fuses

Generation - Principles of

Grounding

Incandescent lights

Inductance - Introduction to; reactance

Insulation - of wire

Mathematics - Square root; vectors' figuring percentages

Motors - Motors vs. Generators/CEMF; single phase; capacitor; repulsion; shaded pole; basic principles of AC motors

Ohm's Law

Power

Power factor - AC circuits; correction of; problems

Rectifiers

Resistance - of wire

Rigging

Safety - Electrical shock

Services

Three-wire system

Tools

Transformers - Principles of; types; single phase; three-phase connections

Voltage polarity across a load

Wiring methods - Conduit; general

Wiring systems - Less than 600 volts; 480/277 volts; three-phase delta or wye; distribution systems over 600 volts.

SPECIALTY ELECTRICIAN EXAMINATIONS MAY BE BASED ON THESE SUBJECTS:

- AC – Meters
- Appliance circuits or controls
- Blueprints – Floor plans; service and feeders
- Cables – Wiring methods
- Calculations
- Circuits – Series; parallel; combination; basic; outside branch
- Conductor – Voltage drop (line loss); grounded; Aluminum or copper
- Conduit – Wiring methods
- Electrical signs, circuits, controls, or services
- Electrical units
- First aid
- Fuses
- General lighting
- Grounding of conductors
- Insulation of wire
- Ladder safety
- Limited energy circuits or systems
- Maintenance of electrical systems
- Mathematics – Figuring percentage
- Motor circuits, controls, feeders, or services
- Ohm's Law
- Overcurrent protection
- Resistance of wire
- Services
- Sizes of building wire
- Three-wire system
- Tools
- Transformer – Ratios; single-phase

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-401-180, filed 7/21/88; 81-06-037 (Order 81-5), § 296-401-180, filed 2/27/81, effective 4/1/81. Statutory Authority: RCW 18-.37.130, 80-02-052 (Order 80-1), § 296-401-180, filed 1/16/80.]

(a) To which a label, symbol, or other identifying mark of an approved testing laboratory has been attached to indicate that the manufacturer produced the product in compliance with appropriate standards or that the product performs in a specified manner.

(b) That is not decertified.

(4) "Certification mark" means a specified approved testing laboratory identification indicating that a certified electrical product has been manufactured in accordance with the requirements of appropriate standards or tested for specific end uses.

(5) "Certification program" means a specified set of testing, inspection, and quality assurance procedures, with appropriate implementing authority directed toward evaluating products for certification of compliance to the requirements of appropriate standards.

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

(7) "Electrical board" means the board established pursuant to RCW 19.28.065. The term "electrical board" also includes an administrative law judge or board member appointed by the board to hear an appeal.

(8) "Labeled" means an electrical product to which a label, symbol, or other identifying mark of an approved laboratory is attached.

(9) "Laboratory operations control manual" means a document consisting of specified procedures and information for each test method responding to the application requirements of the product standard.

(10) "Quality control manual" means a document consisting of general guidelines for the quality control of the laboratory's method of operation. Specific information is provided for portions of individual test methods whenever specifics are needed to comply with the criteria or otherwise support the laboratory's operations.

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-402-030, filed 7/21/88. Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-030, filed 10/2/85.]

**Chapter 296-402 WAC
ELECTRICAL TESTING LABORATORY
ACCREDITATION**

- WAC
- 296-402-030 Definitions.
 - 296-402-140 Initial laboratory evaluation.
 - 296-402-150 Renewals.
 - 296-402-190 Revocation and suspension procedures.
 - 296-402-200 Appeal procedures.

WAC 296-402-030 Definitions. The definitions set forth in this section shall apply throughout this chapter.

(1) "ANSI" means American National Standards Institute.

(2) "Board" means the electrical board established pursuant to RCW 19.28.065. The term "board" also includes an administrative law judge or board member appointed by the board to hear an appeal.

(3) "Certified electrical product" means an electrical product that is certified under this chapter:

WAC 296-402-140 Initial laboratory evaluation. (1) The department shall:

(a) Accept requests for testing laboratory certification.

(b) Make an administrative review to ensure completeness and accuracy of information.

(c) Review the request.

(d) Arrange for the laboratory on-site inspection by a technically qualified representative of the department to evaluate compliance with accreditation criteria. The cost shall be borne by the applicant.

(2) Notification of evaluation and evaluation results. The department shall notify the applicant of the recommendation of the department and time and place of the hearing to consider the request.

(3) Fees. There shall be an initial filing fee accompanying the application, an initial accreditation fee, and a biennial renewal fee as established from time to time by the department. Evaluation costs including travel expenses and any additional related expenses shall be borne by the laboratory. On-site inspections, requiring

fees, shall not be made more than once a year, unless additional inspections are required by the department or requested by the laboratory.

Initial filing fee	\$ 500.00
Initial accreditation fee:	
One product category	\$ 250.00
Each additional category for the next nineteen categories	\$ 100.00 each
Maximum for twenty categories or more	\$2150.00
Biennial renewal fee	50% of the amount of the initial accreditation fee

(4) Number and category. Each accredited testing laboratory shall be identified by the number of electrical product category(ies) that the department has determined the laboratory is qualified to evaluate. The accreditation shall indicate the electrical product category(ies) for which accreditation is issued.

(5) Approval. The department shall accept or deny laboratory approval. Such approval shall be subject to reexamination when deemed necessary by the department.

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-402-140, filed 7/21/88. Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-140, filed 10/2/85.]

WAC 296-402-150 Renewals. At least thirty days prior to the expiration date of any such accreditation, the electrical testing laboratory shall forward to the department an application for renewal. The department, upon receipt of the completed form and fee, shall renew accreditation for a period of two years or notify such applicant of the department's refusal with reasons thereof. Accreditation may be renewed for one or more electrical product category(ies) and renewal may be refused for one or more electrical product category(ies).

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-402-150, filed 7/21/88. Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-150, filed 10/2/85.]

WAC 296-402-190 Revocation and suspension procedures. (1) Revocation and suspension. The department on its own initiative may suspend or revoke the accreditation of any testing laboratory found to be in noncompliance with these rules and regulations, the laws of the state of Washington, or having substantial evidence of the laboratory's conduct in unethical business practices.

(2) Notice and conference. Prior to suspension, revocation, or failure to renew the accreditation of a laboratory, written notice of such intent shall be served by certified mail by the department. Within fifteen calendar days of receipt of such notice, the affected laboratory may request a conference before the department. Should the electrical testing laboratory disagree with the decision of the department, an appeal may be made to the electrical board, as provided for in WAC 296-402-200.

(3) Effect of suspension and revocation. If the accreditation is suspended, revoked, or not renewed, the laboratory shall immediately notify the involved manufacturers whose products are covered by the accreditation that such products manufactured subsequent to the revocation and offered for sale in the state of Washington can no longer bear the laboratory's label that identified it as a certified product.

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-402-190, filed 7/21/88. Statutory Authority: RCW 19.28.010, 19.28.060, 19.28.065 and 19.28.070, 85-20-130 (Order 85-27), § 296-402-190, filed 10/2/85.]

WAC 296-402-200 Appeal procedures. (1) An applicant or electrical product testing laboratory that disagrees with the action of the department regarding accreditation, qualification or approval or denial of product categories may appeal to the electrical board. An appeal shall be made in writing to the department chief electrical inspector as secretary to the board within fifteen days of receiving an adverse decision from the department. The written appeal shall state the decision of the department that is being appealed and the relief that is desired.

(2) A request for a formal appeal shall be accompanied by a certified check in the amount of two hundred dollars made payable to the department. The deposit shall be returned to the aggrieved party if the decision of the department is not sustained or upheld. If the decision of the department is sustained or upheld, the deposit shall be used to pay the expenses of holding the hearing and any balance remaining after payment of the hearing expenses shall be paid into the electrical license fund. The formal appeal shall be held in conformance with the requirements of the Administrative Procedure Act, chapter 34.04 RCW, and will be heard at a regular or special board meeting, at a special hearing date or may be assigned by the board to an administrative law judge.

(3) An informal appeal will be heard by the board at a regular or special board meeting.

(4) See chapter 296-13 WAC for additional information on appeals before the electrical board.

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-402-200, filed 7/21/88.]

Chapter 296-403 WAC

AMUSEMENT RIDES OR STRUCTURES

WAC

296-403-010 Definitions.
296-403-070 Appeals.

WAC 296-403-010 Definitions. (1) "Amusement structure" means any electrical or mechanical devices or combinations thereof operated for revenue and to provide amusement or entertainment to viewers or audiences at carnivals, fairs, or amusement parks. "Amusement structure" does not include games in which a member of the public must perform an act, nor concessions at which customers may make purchases.

(2) "Amusement ride" means any vehicle, boat, or other mechanical device moving upon or within a structure, along cables or rails, through the air by centrifugal force or otherwise, or across water, that is used to convey one or more individuals for amusement, entertainment, diversion, or recreation. "Amusement ride" includes, but is not limited to, devices commonly known as skyrides, ferris wheels, carousels, parachute towers, tunnels of love, and roller coasters. "Amusement ride" shall not include: (a) Conveyances for persons in recreational winter sports activities such as ski lifts, ski tows, j-bars, t-bars, and similar devices subject to regulation under chapter 70.88 RCW; (b) any single-passenger coin-operated ride that is manually, mechanically, or electrically operated and customarily placed in a public location and that does not normally require the supervision or services of an operator; (c) nonmechanized playground equipment, including but not limited to, swings, seesaws, stationary spring-mounted animal features, rider-propelled merry-go-rounds, climbers, slides, trampolines, and physical fitness devices; or (d) water slides.

(3) "Board" means the electrical board established pursuant to RCW 19.28.065. The term "board" also includes an administrative law judge or board member(s) appointed by the board to hear an appeal.

(4) "Electrical board" means the board established pursuant to RCW 19.28.065. The term "electrical board" also includes an administrative law judge or board member(s) appointed by the board to hear an appeal.

(5) "Department" means the department of labor and industries.

(6) "Insurance policy" means an insurance policy written by an insurer authorized to do business in this state under Title 48 RCW.

(7) "Certificate of inspection" means a document given under oath or affirmation from an insurer or a person with whom the insurer has contracted to make a mechanical safety inspection of the amusement ride or structure. The certificate shall contain the name, address and notarized signature of the inspector, the complete description of the amusement ride or structure and the name and address of the owner or operator.

(8) "Certificate of insurance" means a document certifying that the insurance required by chapter 67.42 RCW is in effect.

(9) "Operating permit" means a permit which is issued by the department.

(10) "Operating permit decal" is a decal issued by the department which shall be affixed on or adjacent to the control panel of the amusement ride or structure in a location visible to the patrons of the ride or structure.

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-403-010, filed 7/21/88. Statutory Authority: Chapter 67.42 RCW, 86-12-019 (Order 86-16), § 296-403-010, filed 5/28/86.]

an amusement ride inspector application has been denied, or certificate has been suspended or revoked, may be appealed to the electrical board. The appeal shall be conducted in accordance with chapter 34.04 RCW. An appeal shall not stay the decision of the department. The appeal shall be filed within fifteen days after notice of the decision of the department is given by certified mail, return receipt requested, or is served upon the owner or operator.

(2) A formal appeal shall be affected by filing a written notice of appeal with the department's chief electrical inspector and shall state the decision by the department that is being appealed and the relief that is desired. The formal appeal shall be accompanied by a certified check for two hundred dollars which shall be returned to the holder of the certificate or permit if the decision of the department is not sustained by the board. If the board sustains the decision of the department, the two hundred dollars shall be applied by the department to the payment of the per diem and expenses of the members of the board incurred in the matter, and any balance remaining after payment of per diem and expenses shall be paid into the electrical license fund.

(3) An informal appeal shall be made in writing to the department chief electrical inspector and shall state the action by the department that is being appealed and the relief that is desired.

(4) See chapter 296-13 WAC for additional information on appeals before the electrical board.

[Statutory Authority: RCW 19.28.060, 88-16-002 (Order 88-15), § 296-403-070, filed 7/21/88. Statutory Authority: Chapter 67.42 RCW, 86-12-019 (Order 86-16), § 296-403-070, filed 5/28/86.]

WAC 296-403-070 Appeals. (1) A decision by the department in which; an operating permit has been denied or revoked; the department has ordered the cessation of the operation of an amusement ride or structure;