

Chapter 246-243 WAC

RADIATION PROTECTION—INDUSTRIAL RADIOGRAPHY

WAC

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DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

246-243-210	Special requirements for enclosed radiography. [Statutory Authority: RCW 70.98.050. WSR 94-01-073, § 246-243-210, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 70.98.050 and 70.98.080. WSR 91-15-112 (Order 184), § 246-243-210, filed 7/24/91, effective 8/24/91. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-210, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.080. WSR 83-19-050 (Order 2026), § 402-36-155, filed 9/16/83. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-155, filed 12/8/80; Order 1084, § 402-36-155, filed 1/14/76.] Repealed by WSR 00-08-013, filed 3/24/00, effective 4/24/00. Statutory Authority: RCW 70.98.050.
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WAC 246-243-001 Purpose. The regulations in this chapter establish radiation safety requirements for persons utilizing sources of radiation for industrial radiography. The requirements of this chapter are in addition to and not in substitution for other requirements of these regulations.

[Statutory Authority: RCW 70.98.050 and 70.98.110. WSR 16-13-054, § 246-243-001, filed 6/10/16, effective 7/11/16. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-001, filed

(6/10/16)

12/27/90, effective 1/31/91; Order 1084, § 402-36-010, filed 1/14/76; Order 1, § 402-36-010, filed 1/8/69; Rules (part), filed 10/26/66.]

WAC 246-243-010 Scope. The regulations in this chapter apply to all licensees who use sources of radiation for industrial radiography: Provided, however, that nothing in this chapter shall apply to the use of sources of radiation in the healing arts.

[Statutory Authority: RCW 70.98.050 and 70.98.110. WSR 16-13-054, § 246-243-010, filed 6/10/16, effective 7/11/16. Statutory Authority: RCW 70.98.050. WSR 94-01-073, § 246-243-010, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-010, filed 12/27/90, effective 1/31/91; Order 1084, § 402-36-020, filed 1/14/76; Order 1, § 402-36-020, filed 1/8/69; Rules (part), filed 10/26/66.]

WAC 246-243-020 Definitions, abbreviations, and acronyms. The definitions, abbreviations, and acronyms in this section and in WAC 246-220-010 apply throughout this chapter, unless the context clearly indicates otherwise.

(1) **"Annual refresher safety training"** means a review conducted or provided by the licensee for its employees on radiation safety aspects of industrial radiography. The review may include, as appropriate, the results of internal inspections, new procedures or equipment, new or revised regulations, accidents or errors that have been observed, and should also provide opportunities for employees to ask safety questions.

(2) **"Associated equipment"** means equipment that is used in conjunction with a radiographic exposure device to make radiographic exposures which drives, guides, or comes in contact with the source, for example guide tube, control tube, control (drive) cable, removable source stop, "J" tube and collimator when it is used as an exposure head.

(3) **"Certifying entity"** means an independent certifying organization meeting the requirements in WAC 246-243-250 Appendix C or an agreement state meeting the requirements in WAC 246-243-250 Appendix C, subsections (2) and (3).

(4) **"Collimator"** means a radiation shield that is placed on the end of the guide tube or directly onto a radiographic exposure device to restrict the size of the radiation beam when the sealed source is cranked into position to make a radiographic exposure.

(5) **"Control (drive) cable"** means the cable that is connected to the source assembly and used to drive the source to and from the exposure location.

(6) **"Control drive mechanism"** means a device that enables the source assembly to be moved to and from the exposure device.

(7) **"Control tube"** means a protective sheath for guiding the control cable. The control tube connects the control drive mechanism to the radiographic exposure device.

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(8) **"Exposure head"** means a device that locates the gamma radiography sealed source in the selected working position. (An exposure head is also known as a source stop.)

(9) **"Field station"** means a facility where licensed material may be stored or used and from which equipment is dispatched.

(10) **"Guide tube (projection sheath)"** means a flexible or rigid tube for guiding the source assembly and the attached control cable from the exposure device to the exposure head. The guide tube may also include the connections necessary for attachment to the exposure device and to the exposure head.

(11) **"Hands-on experience"** means experience in all of those areas considered to be directly involved in the radiography process.

(12) **"Independent certifying organization"** means an independent organization that meets all of the criteria of WAC 246-243-250 Appendix C.

(13) **"Industrial radiography"** means the examination of the macroscopic structure of materials by nondestructive methods utilizing sources of radiation to make radiographic images. Industrial radiography as used in this chapter does not include well logging operations.

(14) **"Lay-barge radiography"** means industrial radiography performed on any water vessel used for laying pipe.

(15) **"Offshore platform radiography"** means industrial radiography conducted from a platform over a body of water.

(16) **"Permanent radiographic installation"** means an enclosed shielded room, cell or vault, not located at a temporary job site, in which radiography is performed, regardless of ownership.

(17) **"Practical examination"** means a demonstration through practical application of the safety rules and principles in industrial radiography including use of all appropriate equipment and procedures.

(18) **"Radiation safety officer for industrial radiography"** means an individual with the responsibility for the overall radiation safety program on behalf of the licensee and who meets the requirements of WAC 246-243-047.

(19) **"Radiographer"** means any individual who performs or who, in attendance at the site where sources of radiation are being used, personally supervises industrial radiographic operations and who is responsible to the licensee for assuring compliance with the requirements of these regulations and all license conditions.

(20) **"Radiographer certification"** means written approval received from a certifying entity stating that an individual has satisfactorily met certain established radiation safety, testing, and experience criteria.

(21) **"Radiographer's assistant"** means any individual who, under the personal supervision of a radiographer, uses sources of radiation, related handling tools, or radiation survey instruments in industrial radiography.

(22) **"Radiographic exposure device"** means any instrument containing a sealed source fastened or contained therein, in which the sealed source or shielding thereof may be moved, or otherwise changed, from a shielded to unshielded position for purposes of making a radiographic exposure.

(23) **"Radiographic operations"** means all activities associated with the presence of radioactive sources in a radiographic exposure device during use of the device or transport (except when being transported by a common or contract carrier), to include surveys to confirm the adequacy of boundaries, setting up equipment and any activity inside restricted area boundaries.

(24) **"S-tube"** means a tube through which the radioactive source travels when inside a radiographic exposure device.

(25) **"Shielded position"** means the location within the radiographic exposure device or source changer where the sealed source is secured and restricted from movement.

(26) **"Source assembly"** means an assembly that consists of the sealed source and a connector that attaches the source to the control cable. The source assembly may also include a stop ball used to secure the source in the shielded position.

(27) **"Source changer"** means a device designed and used for replacement of sealed sources in radiographic exposure devices, including those also used for transporting and storage of sealed sources.

(28) **"Storage area"** means any location, facility, or vehicle which is used to store or to secure a radiographic exposure device, a storage container, or a sealed source when it is not in use and which is locked or has a physical barrier to prevent accidental exposure, tampering with, or unauthorized removal of the device, container, or source.

(29) **"Storage container"** means a container in which sealed sources are secured and stored.

(30) **"Temporary job site"** means a location where radiographic operations are conducted and where licensed material may be stored other than those locations of use authorized on the license.

(31) **"Underwater radiography"** means industrial radiography performed when the radiographic exposure device or related equipment are beneath the surface of the water.

[Statutory Authority: RCW 70.98.050 and 70.98.110. WSR 16-13-054, § 246-243-020, filed 6/10/16, effective 7/11/16. Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-020, filed 3/24/00, effective 4/24/00; WSR 94-01-073, § 246-243-020, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 70.98.050 and 70.98.080. WSR 91-15-112 (Order 184), § 246-243-020, filed 7/24/91, effective 8/24/91. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-020, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.080. WSR 83-19-050 (Order 2026), § 402-36-025, filed 9/16/83. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-025, filed 12/8/80; Order 1084, § 402-36-025, filed 1/14/76.]

WAC 246-243-030 Conducting industrial radiography operations. (1) Whenever radiography is performed at a location other than a permanent radiographic installation, the radiographer must be accompanied by at least one other qualified radiographer or an individual who has at a minimum met the requirements of WAC 246-243-130(2) (radiographer's assistant). The additional qualified individual shall observe the operations and be capable of providing immediate assistance to prevent unauthorized entry. Radiography may not be performed if only one qualified individual is present.

(2) All radiographic operations conducted at locations of use authorized on the license must be conducted in a perma-

ment radiographic installation, unless specifically authorized by the department.

(3) Offshore platform, lay-barge, or underwater radiography shall be performed only by licensees whose license specifically authorizes such activity. Such operations fall under the jurisdiction of the United States Nuclear Regulatory Commission when conducted outside of the territorial waters of the state of Washington.

[Statutory Authority: RCW 70.98.050 and 70.98.110. WSR 16-13-054, § 246-243-030, filed 6/10/16, effective 7/11/16. Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-030, filed 3/24/00, effective 4/24/00. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-030, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.080. WSR 83-19-050 (Order 2026), § 402-36-027, filed 9/16/83.]

WAC 246-243-040 Equipment performance requirements. Equipment used in industrial radiography operations must meet the following minimum criteria:

(1)(a) Each radiographic exposure device, source assembly or sealed source, and all associated equipment must meet the requirements specified in American National Standards Institute, N432-1980 "*Radiological Safety for the Design and Construction of Apparatus for Gamma Radiography*," (published as NBS Handbook 136, issued January 1981). This publication may be purchased from American National Standards Institute, Inc., 25 West 43rd Street, New York, New York, 10036; telephone: 212-642-4900. Copies of the document are available for inspection at the Department of Health, Office of Radiation Protection, Olympia, Washington. A copy of the document is also on file at the National Archives and Records Administration. For information on the availability of this material at the National Archives and Records Administration call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

(b) Engineering analysis may be submitted by an applicant or licensee to demonstrate the applicability of previously performed testing on similar individual radiography equipment components. Upon review, the department may find this an acceptable alternative to actual testing of the component pursuant to the above referenced standard.

(c) Notwithstanding (a) of this subsection, equipment used in industrial radiographic operations need not comply with § 8.9.2(c) of the Endurance Test in American National Standards Institute N432-1980, if the prototype equipment has been tested using a torque value representative of the torque that an individual using the radiography equipment can realistically exert on the lever or crankshaft of the drive mechanism.

(2) In addition to the requirements specified in subsection (1) of this section, the following requirements apply to radiographic exposure devices, source changers, source assemblies and sealed sources.

(a) The licensee shall ensure that each radiographic exposure device has attached to it a durable, legible, clearly visible label bearing the:

(i) Chemical symbol and mass number of the radionuclide in the device;

(ii) Activity and the date on which this activity was last measured;

(iii) Model (or product code) and serial number of the sealed source;

(iv) Manufacturer's identity of the sealed source; and

(v) Licensee's name, address, and telephone number.

(b) Radiographic exposure devices intended for use as Type B transport containers must meet the applicable requirements of 10 C.F.R. Part 71.

(c) Modification of radiographic exposure devices, source changers, and source assemblies and associated equipment is prohibited, unless the design of any replacement component, including source holder, source assembly, controls or guide tubes would not compromise the design safety features of the system.

(3) In addition to the requirements specified in subsections (1) and (2) of this section, the following requirements apply to radiographic exposure devices, source assemblies, and associated equipment that allow the source to be moved out of the device for radiographic operations or to source changers.

(a) The coupling between the source assembly and the control cable must be designed in such a manner that the source assembly will not become disconnected if cranked outside the guide tube. The coupling must be such that it cannot be unintentionally disconnected under normal and reasonably foreseeable abnormal conditions.

(b) The device must automatically secure the source assembly when it is cranked back into the fully shielded position within the device. The securing system may only be released by means of a deliberate operation on the exposure device.

(c) The outlet fittings, lock box, and drive cable fitting on each radiographic exposure device must be equipped with safety plugs or covers which must be installed during storage and transportation to protect the source assembly from water, mud, sand, or other foreign matter.

(d)(i) Each sealed source or source assembly must have attached to it or engraved on it, a durable, legible, visible label with the words: "DANGER—RADIOACTIVE."

(ii) The label may not interfere with the safe operation of the exposure device or associated equipment.

(e) The guide tube must be able to withstand a crushing test that closely approximates the crushing forces that are likely to be encountered during use, and be able to withstand a kinking resistance test that closely approximates the kinking forces likely to be encountered during use.

(f) Guide tubes must be used when moving the source out of the device.

(g) An exposure head or similar device designed to prevent the source assembly from passing out of the end of the guide tube must be attached to the outermost end of the guide tube during radiographic operations.

(h) The guide tube exposure head connection must be able to withstand the tensile test for control units specified in ANSI N432-1980.

(i) Source changers must provide a system for ensuring that the source will not be accidentally withdrawn from the changer when connecting or disconnecting the drive cable to or from a source assembly.

(4) All radiographic exposure devices and associated equipment in use after January 1, 1998, must comply with the requirements of this section.

(5) The maximum exposure rate limits for storage containers and source changers with the sealed source in the shielded position are:

(a) 2 millisieverts (200 millirem) per hour at any exterior surface; and

(b) 0.1 millisieverts (10 millirem) per hour at one meter from any exterior surface.

[Statutory Authority: RCW 70.98.050 and 70.98.110. WSR 16-13-054, § 246-243-040, filed 6/10/16, effective 7/11/16. Statutory Authority: RCW 70.98.050. WSR 99-05-012, § 246-243-040, filed 2/5/99, effective 3/8/99; WSR 94-01-073, § 246-243-040, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-040, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-030, filed 12/8/80; Order 1084, § 402-36-030, filed 1/14/76; Order 1, § 402-36-030, filed 1/8/69; Rules (part), filed 10/26/66.]

WAC 246-243-042 Labeling, storage, and transportation. (1) The licensee may not use a source changer or a container to store licensed material unless the source changer or the storage container has securely attached to it a durable, legible, and clearly visible label bearing the standard trefoil radiation caution symbol in conventional colors, that is, magenta, purple or black on a yellow background, having a minimum diameter of 25 mm, and the wording:

CAUTION (or "DANGER")
RADIOACTIVE MATERIAL
NOTIFY CIVIL AUTHORITIES IF FOUND
(or "NAME OF COMPANY")

(2) The licensee may not transport licensed material unless the material is packaged, and the package is labeled, marked, and accompanied with appropriate shipping papers in accordance with regulations set out in 10 C.F.R. Part 71.

(3) Locked radiographic exposure devices and storage containers must be physically secured to prevent tampering or removal by unauthorized personnel. The licensee shall store licensed material in a manner which will minimize danger from explosion or fire.

(4) The licensee shall lock and physically secure the transport package containing licensed material in the transporting vehicle to prevent accidental loss, tampering, or unauthorized removal of the licensed material from the vehicle.

[Statutory Authority: RCW 70.98.050 and 70.98.110. WSR 16-13-054, § 246-243-042, filed 6/10/16, effective 7/11/16. Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-042, filed 3/24/00, effective 4/24/00.]

WAC 246-243-044 Records of receipt and transfer of sealed sources. (1) Each licensee shall maintain records showing the receipts and transfers of sealed sources and of devices using depleted uranium (DU) for shielding and retain each record for three years after it is made.

(2) These records must include the date, shipper or destination, the name of the individual making the record, radionuclide, number of becquerels (curies) or mass (for DU), and manufacturer, model, and serial number of each sealed source or device, as appropriate.

[Statutory Authority: RCW 70.98.050 and 70.98.110. WSR 16-13-054, § 246-243-044, filed 6/10/16, effective 7/11/16. Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-044, filed 3/24/00, effective 4/24/00.]

WAC 246-243-047 Radiation safety officer for industrial radiography. The radiation safety officer (RSO) shall ensure that radiation safety activities are being performed in accordance with approved procedures and regulatory requirements in the daily operation of the licensee's program.

(1) The minimum qualifications, training, and experience for RSOs for industrial radiography are as follows:

(a) Completion of the training and testing requirements of WAC 246-243-130(1);

(b) Two thousand hours of hands-on experience as a qualified radiographer in industrial radiographic operations utilizing sealed radioactive material; and

(c) Formal training in the establishment and maintenance of a radiation protection program.

(2) The department will consider alternatives when the RSO has appropriate training or experience in the field of ionizing radiation, and in addition, has adequate formal training with respect to the establishment and maintenance of a radiation safety protection program.

(3) The specific duties and authorities of the RSO include, but are not limited to:

(a) Establishing and overseeing all operating, emergency, and ALARA procedures as required by chapter 246-221 WAC, and reviewing them regularly to ensure that the procedures in use conform to current chapter 246-221 WAC requirements, conform to other department regulations and to the license conditions;

(b) Overseeing and approving all phases of the training program for radiographic personnel, ensuring that appropriate and effective radiation protection practices are taught;

(c) Ensuring that required radiation surveys and leak tests are performed and documented in accordance with the regulations, including any corrective measures when levels of radiation exceed established limits;

(d) Ensuring that personnel monitoring devices are calibrated and used properly by occupationally exposed personnel, that records are kept of the monitoring results, and that timely notifications are made as required by WAC 246-221-260; and

(e) Ensuring that operations are conducted safely and to assume control for instituting corrective actions including stopping of operations when necessary.

(4) The licensee will have until January 1, 2001, to meet the requirements of subsection (1) or (2) of this section.

[Statutory Authority: RCW 70.98.050 and 70.98.110. WSR 16-13-054, § 246-243-047, filed 6/10/16, effective 7/11/16. Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-047, filed 3/24/00, effective 4/24/00.]

WAC 246-243-050 Internal inspection program and training. (1) Each licensee shall conduct the internal inspection of job performance required by WAC 246-235-084 at intervals not to exceed six months. Except as provided in subsection (1)(d) of this section, the radiation safety officer (RSO) or designee shall conduct an inspection program of the job performance of each radiographer and radiographer's assistant to ensure that the department's regulations, license requirements, and the licensee's operating and emergency procedures are followed. The inspection program shall:

(a) Include observation of the performance of each radiographer and radiographer's assistant during an actual

industrial radiographic operation, at intervals not to exceed six months; and

(b) Provide that, if a radiographer or a radiographer's assistant has not participated in an industrial radiographic operation for more than six months since the last inspection, the radiographer must demonstrate knowledge of the training requirements of WAC 246-243-130 (1)(c) and the radiographer's assistant must redemonstrate knowledge of the training requirements of WAC 246-243-130 (2)(b) by a practical examination before these individuals can next participate in a radiographic operation.

(c) The department may consider alternatives in situations where the individual serves as both radiographer and RSO.

(d) In operations where a single individual serves as both radiographer and RSO, and performs all radiography operations, an inspection program is not required.

(2) The licensee shall provide annual refresher safety training for each radiographer and radiographer's assistant at intervals not to exceed twelve months.

(3) Each licensee shall maintain the following records for three years after the record is made:

(a) For semiannual inspection of job performance, the record shall include:

- (i) A list of the items checked; and
- (ii) Any noncompliances observed by the RSO;

(b) For annual refresher safety training, the record shall include:

- (i) A list of the topics discussed;
- (ii) The dates the training was conducted; and
- (iii) Names of the instructors and attendees.

[Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-050, filed 3/24/00, effective 4/24/00. Statutory Authority: RCW 70.98.050 and 70.98.080. WSR 92-06-008 (Order 245), § 246-243-050, filed 2/21/92, effective 3/23/92. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-050, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.080. WSR 83-19-050 (Order 2026), § 402-36-035, filed 9/16/83.]

WAC 246-243-060 Locking of radiographic exposure devices. (1) Each radiographic exposure device shall be provided with a lock or outerlocked container designed to prevent unauthorized or accidental production of radiation or removal or exposure of a sealed source and shall be locked when returned to the shielded position at all times. If it is a keyed-lock, the key shall be removed at all times when not under the direct surveillance of a radiographer or a radiographer's assistant except at permanent radiographic installations as stated in WAC 246-243-170. In addition, during radiographic operations the sealed source assembly shall be locked in the shielded position each time the source is returned to that position.

(2) Each sealed source storage container and source changer shall have a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position. Storage containers and source changers shall be kept locked (and if a keyed-lock, with the key removed at all times) when containing sealed sources except when under the direct surveillance of a radiographer or a radiographer's assistant.

(3) Radiographic exposure devices, source changers, and storage containers, prior to being moved from one location to

another and also prior to being secured at a given location, shall be locked and surveyed to assure that the sealed source is in the shielded position.

[Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-060, filed 3/24/00, effective 4/24/00. Statutory Authority: RCW 70.98.050 and 70.98.080. WSR 91-15-112 (Order 184), § 246-243-060, filed 7/24/91, effective 8/24/91. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-060, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-040, filed 12/8/80; Order 1084, § 402-36-040, filed 1/14/76; Order 1, § 402-36-040, filed 1/8/69; Rules (part), filed 10/26/66.]

WAC 246-243-070 Storage precautions. (1) Locked radiographic exposure devices and storage containers shall be physically secured to prevent tampering or removal by unauthorized personnel.

(2) At least one calibrated and operable radiation survey instrument shall be available at the storage area whenever a radiographic exposure device, a storage container, or source is being placed in storage.

[Statutory Authority: RCW 70.98.050. WSR 94-01-073, § 246-243-070, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-070, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-050, filed 12/8/80; Order 1084, § 402-36-050, filed 1/14/76; Order 1, § 402-36-050, filed 1/8/69; Rules (part), filed 10/26/66.]

WAC 246-243-080 Radiation survey instruments. (1) The licensee shall maintain sufficient calibrated and operable radiation survey instruments at each location where radioactive material is present to make physical radiation surveys as required by this part and chapter 246-221 WAC. Instrumentation required by this section shall be capable of measuring a range from 0.02 millisieverts (2 millirems) per hour through 0.01 sievert (1 rem) per hour.

(2) Each radiation survey instrument shall be calibrated:

(a) At intervals not to exceed six months and after each instrument servicing except for battery changes;

(b) Such that accuracy within ± 20 percent of the calibration source can be demonstrated at each point checked; and

(c) For linear scale instruments, at two points located approximately one-third and two-thirds of full scale on each scale; for logarithmic scale instruments, at mid-range of each decade; and for digital instruments at three points between 0.02 and 10 millisieverts (2 and 1000 millirems) per hour.

(3) Records shall be maintained of these calibrations for three years after the calibration date for inspection by the department.

[Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-080, filed 3/24/00, effective 4/24/00; WSR 94-01-073, § 246-243-080, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 70.98.050 and 70.98.080. WSR 91-15-112 (Order 184), § 246-243-080, filed 7/24/91, effective 8/24/91. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-080, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.080. WSR 83-19-050 (Order 2026), § 402-36-060, filed 9/16/83. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-060, filed 12/8/80; Order 1084, § 402-36-060, filed 1/14/76; Order 1, § 402-36-060, filed 1/8/69; Rules (part), filed 10/26/66.]

WAC 246-243-090 Leak testing, repair, tagging, opening, modification, and replacement of sealed sources. (1) The replacement of any sealed source fastened to or contained in a radiographic exposure device and leak testing,

repair, tagging, opening, or any other modification of any sealed source shall be performed only by persons specifically authorized to do so by the department, the United States Nuclear Regulatory Commission, or any agreement state.

(2) Each sealed source shall be tested for leakage at intervals not to exceed six months. Sealed sources that are in storage and not in use do not require leak testing, but must be tested before use or transfer to another person if the interval of storage exceeds six months. In the absence of a certificate from a transferor that a test has been made within the six-month period prior to the transfer, the sealed source shall not be put into use until tested and results obtained.

(3) The leak test shall be capable of detecting the presence of 185 becquerels (0.005 microcurie) of removable contamination on the sealed source. An acceptable leak test for sealed sources in the possession of a radiography licensee would be to test at the nearest accessible point to the sealed source storage position, or other appropriate measuring point where contamination might accumulate, by a procedure specifically approved in a license condition. Records of leak test results shall be kept in units of becquerels (microcuries) and maintained for inspection by the department for three years after the leak test is performed.

(4) Any test conducted under subsections (2) and (3) of this section which reveals the presence of 185 becquerels (0.005 microcurie) or more of removable radioactive material shall be considered evidence that the sealed source is leaking. The licensee shall immediately withdraw the equipment involved from use and shall cause it to be decontaminated and repaired or to be disposed in accordance with regulations of the department. Within five days after obtaining results of the test, the licensee shall file a report with the department describing the involved equipment, the test results, and the corrective action taken.

(5) Each exposure device using depleted uranium (DU) shielding and an "S" tube configuration must be tested for DU contamination at intervals not to exceed twelve months. The analysis must be capable of detecting the presence of 185 becquerels (0.005 microcuries) of radioactive material on the test sample and must be performed by a person specifically authorized by the department, the United States Nuclear Regulatory Commission or an agreement state to perform the analysis. If testing reveals the presence of 185 becquerels (0.005 microcuries) or more of removable DU contamination, the exposure device must be removed from use until an evaluation of the wear on the S-tube has been made. If the evaluation reveals that the S-tube is worn through, the device may not be used again. DU shielded devices do not have to be tested for DU contamination while in storage and not in use. Before using or transferring such a device however, the device must be tested for DU contamination if the interval of storage exceeded twelve months. A record of the DU leak-test results shall be kept in units of becquerels (microcuries) and maintained for inspection by the department for three years after the DU leak test is made or until the source in storage is removed. Licensees will have until January 1, 2001, to comply with the DU leak testing requirements of this section.

[Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-090, filed 3/24/00, effective 4/24/00; WSR 99-05-012, § 246-243-090, filed 2/5/99, effective 3/8/99; WSR 94-01-073, § 246-243-090, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 70.98.050 and 70.98.080. WSR

91-15-112 (Order 184), § 246-243-090, filed 7/24/91, effective 8/24/91. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-090, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.080. WSR 87-01-031 (Order 2450), § 402-36-070, filed 12/11/86; WSR 83-19-050 (Order 2026), § 402-36-070, filed 9/16/83. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-070, filed 12/8/80; Order 1084, § 402-36-070, filed 1/14/76; Order 1, § 402-36-070, filed 1/8/69; Rules (part), filed 10/26/66.]

WAC 246-243-100 Quarterly inventory. Each licensee shall conduct a quarterly physical inventory to account for all sealed sources and for devices containing depleted uranium (DU) received or possessed. The records of the inventories shall be maintained for three years from the date of inventory for inspection by the department and shall include:

- (1) Exposure device or source changer make, model, and serial number;
- (2) Sealed source serial number and manufacturer;
- (3) Radionuclide and current activity in becquerels (curies) or mass (for DU) in each device;
- (4) Location of sealed source or device/changer;
- (5) Date of inventory;
- (6) Name of person who performed inventory.

[Statutory Authority: RCW 70.98.050 and 70.98.110. WSR 16-13-054, § 246-243-100, filed 6/10/16, effective 7/11/16. Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-100, filed 3/24/00, effective 4/24/00; WSR 94-01-073, § 246-243-100, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-100, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.080. WSR 83-19-050 (Order 2026), § 402-36-080, filed 9/16/83. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-080, filed 12/8/80; Order 1084, § 402-36-080, filed 1/14/76; Order 1, § 402-36-080, filed 1/8/69; Rules (part), filed 10/26/66.]

WAC 246-243-110 Utilization logs. (1) Each licensee shall maintain current logs, which shall be kept available for inspection by the department for three years from the date of the recorded event, at the address specified in the license showing for each sealed source and radiation exposure device the following information:

- (a) A description (including the make, model and serial number) of each radiation exposure device or transport or storage container in which the sealed source is located;
- (b) The identity and signature of the radiographer to whom assigned; and
- (c) Locations where used and dates of use including the dates removed and returned to storage.

(2) A separately identified utilization log is not required if the equivalent information is available in records of the licensee and available at the address specified in the license.

[Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-110, filed 3/24/00, effective 4/24/00; WSR 94-01-073, § 246-243-110, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 70.98.050 and 70.98.080. WSR 91-15-112 (Order 184), § 246-243-110, filed 7/24/91, effective 8/24/91. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-110, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-090, filed 12/8/80; Order 1084, § 402-36-090, filed 1/14/76; Order 1, § 402-36-090, filed 1/8/69; Rules (part), filed 10/26/66.]

WAC 246-243-120 Inspection and maintenance of radiographic exposure devices, transport and storage containers, associated equipment, source changers, and survey instruments. (1) The licensee shall perform visual

and operability checks on survey meters, radiographic exposure devices, transport and storage containers, associated equipment and source changers before use on each day the equipment is to be used to ensure that the equipment is in good working condition, that the sources are adequately shielded, and that required labeling is present. Survey instrument operability must be performed using check sources or other appropriate means. If equipment problems are found, the equipment must be removed from service until repaired.

(2) Each licensee shall have written procedures for:

(a) Inspection and routine maintenance of radiographic exposure devices, source changers, associated equipment, transport and storage containers, and survey instruments at intervals not to exceed three months or before the first use thereafter to ensure the proper functioning of components important to safety. Replacement components shall meet design specifications. If equipment problems are found, the equipment must be removed from service until repaired.

(b) Inspection and maintenance necessary to maintain the Type B packaging used to transport radioactive materials. The inspection and maintenance program must include procedures to assure that Type B packages are shipped and maintained in accordance with the certificate of compliance or other approval.

(3) Any maintenance performed on radiographic exposure devices and accessories shall be in accordance with the manufacturer's specifications.

(4) Records of daily checks and quarterly inspections including any equipment problems identified and of any maintenance performed under subsections (1) and (2) of this section shall be made and retained for three years. The record shall include:

- (a) The date of check or inspection;
- (b) Name of inspector;
- (c) Equipment involved;
- (d) Any problems found; and
- (e) What repair or maintenance, if any, was done.

[Statutory Authority: RCW 70.98.050 and 70.98.110. WSR 16-13-054, § 246-243-120, filed 6/10/16, effective 7/11/16. Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-120, filed 3/24/00, effective 4/24/00; WSR 94-01-073, § 246-243-120, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 70.98.050 and 70.98.080. WSR 91-15-112 (Order 184), § 246-243-120, filed 7/24/91, effective 8/24/91. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-120, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.080. WSR 83-19-050 (Order 2026), § 402-36-095, filed 9/16/83. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-095, filed 12/8/80; Order 1084, § 402-36-095, filed 1/14/76.]

WAC 246-243-130 Limitations—Personal radiation safety requirements for radiographers and radiographers' assistants. (1) No licensee shall permit any individual to act as a radiographer as defined in this chapter until such individual:

(a) Has been instructed in the subjects outlined in WAC 246-243-230, in addition to a minimum of two months of on-the-job training, and is certified through a radiographer certification program by a certifying entity in accordance with the criteria specified in WAC 246-243-250, Appendix C or equivalent regulations of the United States Nuclear Regulatory Commission or an agreement state. The department maintains a list of recognized certifying entities for reference.

The licensee may, until January 1, 2001, allow an individual who has not met the requirement of this subsection, to act as a radiographer after the individual has received training in the subjects outlined in WAC 246-243-230 and demonstrated an understanding of these subjects by successful completion of a written examination that was previously submitted to and approved by the department;

(b) Has received copies of and instruction in the regulations contained in chapters 246-220, 246-221, 246-222, 246-231, and 246-243 WAC, in the United States Department of Transportation regulations as referenced in chapter 246-231 WAC, and the applicable sections of appropriate license, and the licensee's operating and emergency procedures, and shall have demonstrated understanding thereof by successful completion of a written or oral examination covering this material;

(c) Has received training in the use of the licensee's radiographic exposure devices, sealed sources, in the daily inspection of devices and associated equipment, and in the use of radiation survey instruments; and

(d) Has demonstrated understanding of the use of radiographic exposure devices, sources, survey instruments and associated equipment described in subsection (1)(c) of this section by successful completion of a practical examination on the subjects covered.

(2) No licensee shall permit any individual to act as a radiographer's assistant as defined in this chapter until such individual:

(a) Has received copies of and instruction in the regulations contained in chapters 246-220, 246-221, 246-222, 246-231, and 246-243 WAC, in the United States Department of Transportation regulations as referenced in chapter 246-231 WAC, and the applicable sections of appropriate license, and the licensee's operating and emergency procedures;

(b) Has developed competence to use under the personal supervision of the radiographer the radiographic exposure devices, sealed sources, associated equipment, and radiation survey instruments which will be employed in the individual's assignment; and

(c) Has demonstrated understanding of the instructions provided under (a) of this subsection by successfully completing a written test on the subjects covered and has demonstrated competence in the use of the hardware described in (b) of this subsection by successful completion of a practical examination on the use of such hardware.

(3) Each licensee shall maintain, for inspection by the department, records of training and certification which demonstrate that the requirements of subsections (1) and (2) of this section are met. These records shall be maintained for three years after the record is made. The record shall include:

- (a) Radiographer certification documents and verification of certification status;
- (b) Copies of written tests;
- (c) Dates of oral and practical examinations; and
- (d) Names of individuals conducting and receiving the oral and practical examinations.

(4) Licensees will have until January 1, 2001, to comply with the certification requirements specified in subsection (1)(a) of this section, and the additional training requirements specified in subsections (1)(b) and (2)(a) of this section.

[Statutory Authority: RCW 70.98.050 and 70.98.110. WSR 16-13-054, § 246-243-130, filed 6/10/16, effective 7/11/16. Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-130, filed 3/24/00, effective 4/24/00; WSR 94-01-073, § 246-243-130, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 70.98.050 and 70.98.080. WSR 91-15-112 (Order 184), § 246-243-130, filed 7/24/91, effective 8/24/91. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-130, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.080. WSR 83-19-050 (Order 2026), § 402-36-100, filed 9/16/83. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-100, filed 12/8/80; Order 1084, § 402-36-100, filed 1/14/76; Order 1, § 402-36-100, filed 1/8/69; Rules (part), filed 10/26/66.]

WAC 246-243-140 Operating and emergency procedures. The licensee's operating and emergency procedures shall include instructions in at least the following:

(1) The handling and use of sources of radiation to be employed such that no individual is likely to be exposed to radiation doses in excess of the limits established in chapter 246-221 WAC Standards for protection against radiation;

(2) Methods and occasions for conducting radiation surveys;

(3) Methods for controlling access to radiographic areas;

(4) Methods and occasions for locking and securing sources of radiation including radiographic exposure devices, transport and storage containers, and sealed sources;

(5) Personnel monitoring and the use of personnel monitoring equipment including steps that must be taken immediately by radiography personnel if a pocket dosimeter is found to be off-scale or an alarm rate meter alarms unexpectedly;

(6) Transportation to field locations, including packing of sources of radiation in the vehicles, placarding of vehicles when needed, and control of sources of radiation during transportation;

(7) Minimizing exposure of individuals in the event of an accident;

(8) Notifying proper personnel in the event of a theft, loss, overexposure or accident involving sources of radiation;

(9) Maintenance of records;

(10) The inspection, maintenance, and operability checks of radiographic exposure devices, survey instruments, transport containers, and storage containers;

(11) Identifying and reporting defects and noncompliance as required by these regulations; and

(12) Source recovery procedures if the licensee will perform source recovery.

[Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-140, filed 3/24/00, effective 4/24/00; WSR 94-01-073, § 246-243-140, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 70.98.050 and 70.98.080. WSR 91-15-112 (Order 184), § 246-243-140, filed 7/24/91, effective 8/24/91. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-140, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.080. WSR 83-19-050 (Order 2026), § 402-36-110, filed 9/16/83. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-110, filed 12/8/80; Order 1084, § 402-36-110, filed 1/14/76; Order 708, § 402-36-110, filed 8/24/72; Order 1, § 402-36-110, filed 7/2/71; Order 1, § 402-36-110, filed 1/8/69; Rules (part), filed 10/26/66.]

WAC 246-243-141 Copies of operating and emergency procedures. Each licensee shall maintain a copy of current operating and emergency procedures until the department terminates the license. Superseded material shall be retained for three years after the change is approved.

[Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-141, filed 3/24/00, effective 4/24/00.]

WAC 246-243-150 Personnel monitoring control. (1)

A licensee may not permit any individual to act as a radiographer or as a radiographer's assistant unless, at all times during radiographic operations, the individual wears a direct reading pocket dosimeter, an alarming rate meter, and a personnel dosimeter that is processed and evaluated by an accredited National Voluntary Laboratory Accreditation Program (NVLAP) processor on the trunk of the body. In permanent facilities where other appropriate alarming or warning devices are in routine use, the wearing of an alarming rate meter is not required.

(a) Pocket dosimeters must be capable of measuring exposures from zero to at least 200 milliroentgens. Electronic personal dosimeters may only be used in place of ion-chamber pocket dosimeters.

(b) Each personnel dosimeter shall be assigned to and worn by only one individual.

(c) Film badges must be replaced at periods not to exceed one month and other personnel dosimeters processed and evaluated by an accredited NVLAP processor must be replaced at periods not to exceed three months.

(d) After replacement, each personnel dosimeter must be processed as soon as possible.

(2)(a) Direct reading dosimeters such as pocket dosimeters or electronic personal dosimeters shall be read and exposures recorded at the beginning and end of each shift. Pocket dosimeters shall be charged at the beginning of each shift. Pocket dosimeters shall be checked annually at periods not to exceed twelve months for correct response to radiation. Acceptable dosimeters shall read within plus or minus twenty percent of the true radiation exposure.

(b) Each alarming rate meter must:

(i) Be checked to ensure that the alarm functions properly (sounds) prior to use at the start of each shift;

(ii) Be set to give an alarm signal at a maximum preset rate of 5 mSv/hr. (500 mR/hr.);

(iii) Require special means to change the preset alarm functions; and

(iv) Be calibrated annually at periods not to exceed twelve months for correct response to radiation: Acceptable rate meters must alarm within plus or minus twenty percent of the true radiation exposure rate.

(3) If an individual's pocket dosimeter is found to be off-scale, or if his or her electronic personal dosimeter reads greater than 2 millisieverts (200 millirems), and the possibility of radiation exposure cannot be ruled out as the cause, the individual's personnel dosimeter must be sent for processing within twenty-four hours. In addition, the individual may not resume work associated with licensed material use until a determination of the individual's radiation exposure has been made. This determination shall be made by the RSO or the RSO's designee.

(4) If the personnel dosimeter required by this section is lost or damaged, the worker shall cease work immediately until a replacement personnel dosimeter is provided and the exposure is calculated for the time period from issuance to loss or damage of the personnel dosimeter.

(5) Each licensee shall maintain the following exposure records:

(a) Direct reading dosimeter readings and yearly operability checks required by subsection (2) of this section for three years after the record is made.

(b) Records of alarm rate meter calibrations for three years after the record is made.

(c) Reports received from the personnel dosimeter accredited NVLAP processor until the department terminates the licensee.

(d) Records of estimates of exposures as a result of: Off-scale personal direct reading dosimeters, or lost or damaged personnel dosimeters, until the department terminates the license. The time period for which the personnel dosimeter was lost or damaged shall be included in the records.

[Statutory Authority: RCW 70.98.050. WSR 03-12-062, § 246-243-150, filed 6/2/03, effective 7/3/03; WSR 00-08-013, § 246-243-150, filed 3/24/00, effective 4/24/00; WSR 94-01-073, § 246-243-150, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 70.98.050 and 70.98.080. WSR 91-15-112 (Order 184), § 246-243-150, filed 7/24/91, effective 8/24/91. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-150, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.080. WSR 83-19-050 (Order 2026), § 402-36-120, filed 9/16/83. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-120, filed 12/8/80; Order 1084, § 402-36-120, filed 1/14/76; Order 1, § 402-36-120, filed 1/8/69; Rules (part), filed 10/26/66.]

WAC 246-243-160 Supervision of radiographers' assistants. Whenever a radiographer's assistant uses radiographic exposure devices, uses sealed sources or associated equipment, or conducts radiation surveys required by WAC 246-243-190 to determine that the sealed source has returned to the shielded position after an exposure, he or she shall be under the personal supervision of a radiographer, as defined in WAC 246-243-020. Personal supervision shall include (1) the radiographer's personal presence at the site where the sealed sources are being used, (2) the ability of the radiographer to communicate and give immediate assistance if required, and (3) the radiographer's ability to observe the performance of his/her assistant during the operations referred to in this section.

[Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-160, filed 3/24/00, effective 4/24/00; WSR 94-01-073, § 246-243-160, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 70.98.050 and 70.98.080. WSR 91-15-112 (Order 184), § 246-243-160, filed 7/24/91, effective 8/24/91. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-160, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.080. WSR 83-19-050 (Order 2026), § 402-36-125, filed 9/16/83. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-125, filed 12/8/80.]

WAC 246-243-170 Security—Precautionary procedures in radiographic operations. (1) During each radiographic operation, the radiographer or radiographer's assistant shall maintain continuous direct visual surveillance of the operation to protect against unauthorized entry into a high radiation area, as defined in chapter 246-220 WAC except:

At permanent radiographic installations where all entryways are locked and the requirements of WAC 246-243-220 are met.

(2) When not in operation or when not under direct surveillance, portable radiation exposure devices shall be physically secured to prevent removal by unauthorized personnel.

(6/10/16)

[Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-170, filed 3/24/00, effective 4/24/00; WSR 94-01-073, § 246-243-170, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 70.98.050 and 70.98.080. WSR 91-15-112 (Order 184), § 246-243-170, filed 7/24/91, effective 8/24/91. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-170, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-130, filed 12/8/80; Order 1084, § 402-36-130, filed 1/14/76; Order 1, § 402-36-130, filed 1/8/69; Rules (part), filed 10/26/66.]

WAC 246-243-180 Posting. All areas in which industrial radiography is being performed shall be conspicuously posted as required by WAC 246-221-120. Exceptions listed in WAC 246-221-130 do not apply to industrial radiographic operations.

[Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-180, filed 3/24/00, effective 4/24/00; WSR 94-01-073, § 246-243-180, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 70.98.050 and 70.98.080. WSR 91-15-112 (Order 184), § 246-243-180, filed 7/24/91, effective 8/24/91. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-180, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-140, filed 12/8/80; Order 1084, § 402-36-140, filed 1/14/76; Order 1, § 402-36-140, filed 1/8/69; Rules (part), filed 10/26/66.]

WAC 246-243-190 Radiation surveys and survey records. The licensee shall:

(1) Conduct surveys with a calibrated and operable radiation survey instrument that meets the requirements of WAC 246-243-080.

(2) Using a survey instrument meeting the requirements of subsection (1) of this section, conduct a survey of the radiographic exposure device and the guide tube after each exposure when approaching the device or the guide tube. The survey shall determine that the sealed source has returned to its shielded position before exchanging films, repositioning the exposure head, or dismantling equipment.

(3) Conduct a survey of the radiographic exposure device with a calibrated radiation survey instrument any time the source is exchanged and whenever a radiographic exposure device is placed in a storage area to ensure that the sealed source is in its shielded position.

(4) Conduct a physical radiation survey of the boundary of the restricted area during radiographic operations not employing shielded room radiography. The maximum survey reading at the boundary shall be recorded. The records shall indicate approximate distance from source to boundaries, whether or not the exposed source is collimated and any occupied areas with exposure levels greater than 2 mR in any hour during radiographic operations.

(5) Maintain a record of each exposure device survey conducted before the device is placed in storage if that survey is the last one performed in the workday, and records required by subsection (4) of this section, including the model and serial number of the survey meter used, for inspection by the department for three years after completion of the survey. If the survey was used to determine an individual's exposure, however, the records of the survey shall be maintained until the department authorizes their disposition.

[Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-190, filed 3/24/00, effective 4/24/00; WSR 94-01-073, § 246-243-190, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 70.98.050 and 70.98.080. WSR 92-06-008 (Order 245), § 246-243-190, filed 2/21/92, effective 3/23/92. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-190, filed 12/27/90, effective 1/31/91.]

Statutory Authority: RCW 70.98.080. WSR 83-19-050 (Order 2026), § 402-36-150, filed 9/16/83. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-150, filed 12/8/80; Order 1084, § 402-36-150, filed 1/14/76; Order 1, § 402-36-150, filed 1/8/69; Rules (part), filed 10/26/66.]

WAC 246-243-195 Reporting. (1) In addition to the reporting requirements specified in other sections of the regulations, each licensee shall provide a written report to the department within thirty days of the occurrence of any of the following incidents involving radiographic equipment:

(a) Unintentional disconnection of the source assembly from the control cable.

(b) Inability to retract the source assembly to its fully shielded position and secure it in this position.

(c) Failure of any component (critical to safe operation of the device) to properly perform its intended function.

(2) The licensee shall include the following information in each report submitted under subsection (1) of the section.

(a) A description of the equipment problem;

(b) Cause of each incident, if known;

(c) Manufacturer and model number of equipment involved in the incident;

(d) Place, time, and date of incident;

(e) Actions taken to reestablish normal operations;

(f) Corrective actions taken or planned to prevent recurrence;

(g) Qualifications of personnel involved in the incident.

(3) Reports of overexposure submitted under WAC 246-221-260 which involve failure of safety components of radiographic equipment must also include the information specified in subsection (2) of this section.

(4) Any licensee conducting radiographic operations or storing radioactive material at any location not listed on the license for a period in excess of one hundred eighty days in a calendar year, shall notify the department prior to exceeding the one hundred eighty days.

[Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-195, filed 3/24/00, effective 4/24/00; WSR 94-01-073, § 246-243-195, filed 12/9/93, effective 1/9/94.]

WAC 246-243-200 Records required at temporary job sites. Each licensee conducting radiographic operations at a temporary site shall have copies of the following documents and records available at that site for inspection by the department:

(1) Appropriate license;

(2) Operating and emergency procedures;

(3) Applicable regulations;

(4) Survey records required pursuant to WAC 246-243-190 for the period of operation at the site;

(5) Direct reading dosimeter records for the period of operation at the site;

(6) The latest radiation survey instrument calibration record and leak test record for specific devices in use at the site;

(7) The latest calibration record for alarm rate meters and operability checks of pocket dosimeters or electronic personal dosimeters as required by WAC 246-243-150;

(8) Utilization records for each radiographic exposure device dispatched from that location as required by WAC 246-243-110;

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(9) Records of equipment problems identified in daily checks of equipment as required by WAC 246-243-120;

(10) Records of alarm system and entrance control checks required by WAC 246-243-220, if applicable;

(11) The shipping papers for the transportation of radioactive materials; and

(12) When operating under reciprocity pursuant to WAC 246-232-040, a copy of the NRC or agreement state license authorizing the use of radioactive material.

[Statutory Authority: RCW 70.98.050 and 70.98.110. WSR 16-13-054, § 246-243-200, filed 6/10/16, effective 7/11/16. Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-200, filed 3/24/00, effective 4/24/00; WSR 94-01-073, § 246-243-200, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 70.98.050 and 70.98.080. WSR 91-15-112 (Order 184), § 246-243-200, filed 7/24/91, effective 8/24/91. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-200, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-153, filed 12/8/80.]

WAC 246-243-203 Form of records. Each record required by this chapter must be legible throughout the specified retention period. The record may be the original or a reproduced copy or a microform provided that the copy or microform is authenticated by authorized personnel and that the microform is capable of reproducing a clear copy throughout the required retention period. The record may also be stored in electronic media with the capability for producing legible, accurate, and complete records during the required retention period. Records, such as letters, drawings, and specifications, must include all pertinent information, such as stamps, initials, and signatures. The licensee shall maintain adequate safeguards against tampering with and loss of records.

[Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-203, filed 3/24/00, effective 4/24/00.]

WAC 246-243-205 Temporary job site notification.

(1) Each licensee shall provide notification to the department as required by the department, preferably twenty-four hours but no later than two hours, prior to beginning radiographic operations at a temporary job site. The notification will be given by using the prescribed 1-800 telephone notification system. The notification shall include:

(a) Name and office telephone number of the licensee;

(b) Radioactive materials license number;

(c) Address or directions to the temporary job site;

(d) Specific dates, times, and duration of expected radiographic operations;

(e) Names of radiographers and, if applicable, radiographer assistants taking part in the radiographic operations; and

(f) Name and telephone number of a contact person at the temporary job site.

(2) In the event that operations at a temporary job site continue for longer than thirty days, the licensee will again notify the department, as required by subsection (1) of this section, each succeeding month.

[Statutory Authority: RCW 70.98.050 and 70.98.110. WSR 16-13-054, § 246-243-205, filed 6/10/16, effective 7/11/16. Statutory Authority: RCW 70.98.050. WSR 94-01-073, § 246-243-205, filed 12/9/93, effective 1/9/94.]

WAC 246-243-220 Special requirements for permanent radiographic installation. (1) Each entrance that is

used for personnel access to the high radiation area in a permanent radiographic installation to which this section applies shall have either:

(a) An entrance control of the type described in WAC 246-221-102(1) that reduces the radiation level upon entry into the area; or

(b) Both conspicuous visible and audible warning signals to warn of the presence of radiation. The visible signal shall be actuated by radiation whenever the source is exposed. The audible signal shall be actuated when an attempt is made to enter the installation while the source is exposed.

(2) The alarm system must be tested for proper operation with a radiation source each day before the installation is used for radiographic operations. The test must include a check of both the visible and audible signals. Entrance control devices that reduce the radiation level upon entry (designated in subsection (1)(a) of this section) shall be tested monthly. If an entrance control device or an alarm is operating improperly, it must be immediately labeled as defective and repaired within seven calendar days. The facility may continue to be used during this seven-day period, provided the licensee implements the continuous surveillance requirements of WAC 246-243-170 and uses an alarming rate meter. Test records for entrance controls and audible and visual alarm must be maintained for three years after the record is made.

(3) The department shall review and approve, in advance of construction, plans for permanent radiographic installations whose construction had not commenced by the effective date of these regulations. Construction of the permanent facility shall be in accordance with the plans approved by the department.

(4) A physical radiation survey shall be conducted and results recorded following construction or major modification of the facility to be used in the installation. Radiography shall not be conducted if exposure levels in unrestricted areas are greater than 2 mR in any hour. Any increase in source strength will require resurvey of the installation prior to the conduct of industrial radiography.

[Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-220, filed 3/24/00, effective 4/24/00; WSR 94-01-073, § 246-243-220, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 70.98.050 and 70.98.080. WSR 91-15-112 (Order 184), § 246-243-220, filed 7/24/91, effective 8/24/91. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-220, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.080. WSR 83-19-050 (Order 2026), § 402-36-157, filed 9/16/83. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-157, filed 12/8/80.]

WAC 246-243-230 Appendix A—Minimum subjects to be covered in training radiographers. (1) *Fundamentals of radiation safety*

- (a) Characteristics of ionizing radiation
- (b) Units of radiation dose and quantity of radioactivity
- (c) Hazards of exposure to radiation
 - (i) Radiation protection standards
 - (ii) Biological effects of radiation dose
- (d) Levels of radiation from sources of radiation
- (e) Methods of controlling radiation dose
 - (i) Working time
 - (ii) Working distances

(ii) Shielding

(2) *Radiation detection instrumentation to be used*

(a) Use of radiation survey instruments

(i) Operation

(ii) Calibration

(iii) Limitations

(b) Survey techniques

(c) Use of personnel monitoring equipment

(i) Film badges

(ii) Pocket dosimeters

(iii) Thermoluminescent dosimeters

(iv) Alarming rate meters

(3) *Radiographic equipment to be used*

(a) Operation and control of remote handling equipment, radiographic exposure equipment, and storage containers, including pictures or models of source assemblies (pigtailed)

(b) Inspection and maintenance of equipment

(c) Storage, control, and disposal of licensed material

(4) *The requirements of pertinent federal and state regulations*

(5) *The licensee's written operating and emergency procedures*

(6) *Case histories of radiography accidents.*

[Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-230, filed 3/24/00, effective 4/24/00; WSR 94-01-073, § 246-243-230, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-230, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.050. WSR 81-01-011 (Order 1570), § 402-36-160, filed 12/8/80; Order 1084, § 402-36-160, filed 1/14/76; Order 1, § 402-36-160, filed 1/8/69; Rules (part), filed 10/26/66.]

WAC 246-243-240 Appendix B—General guidelines for inspection of radiography equipment. (1) Panoramic devices (devices in which the source is physically removed from shielded container during exposure) should be inspected for:

- (a) Radiographic exposure unit;
 - (i) Abnormal surface radiation levels anywhere on camera;
 - (ii) Condition of safety plugs;
 - (iii) Proper operation of locking mechanism;
 - (iv) Condition of pigtail connector;
 - (v) Alignment of "S" tube with exit port;
 - (vi) Condition of carrying device (for example, straps and handles);
 - (vii) Proper labeling;
- (b) Source tube;
 - (i) Rust, corrosion, dirt, or sludge buildup inside the source tube;
 - (ii) Condition of source tube connector;
 - (iii) Condition of source stop;
 - (iv) Kinks or damage that could prevent proper operation;
- (c) Control cables and drive mechanism;
 - (i) Proper drive mechanism for this camera, if appropriate;
 - (ii) Changes in general operating characteristics;
 - (iii) Condition of connector on drive cable;
 - (iv) Drive cable flexibility, wear, and rust;
 - (v) Excessive wear or damage to crank assembly parts;
 - (vi) Damage to drive cable conduit that could prevent the cable from moving freely;

- (vii) Connection of the control cable connector with the pigtail connector for proper mating;
- (viii) Proper operation of source position indicator, if applicable.
- (2) Directional beam devices should be inspected for:
 - (a) Abnormal surface radiation;
 - (b) Changes in the general operating characteristics of the unit;
 - (c) Proper operation of shutter mechanism;
 - (d) Chafing or binding of shutter mechanism;
 - (e) Damage to the device which might impair its operation;
 - (f) Proper operation of locking mechanism;
 - (g) Proper drive mechanism with this camera, if appropriate;
 - (h) Condition of carrying device (for example, straps and handles);
 - (i) Proper labeling.

[Statutory Authority: RCW 70.98.050 and 70.98.110. WSR 16-13-054, § 246-243-240, filed 6/10/16, effective 7/11/16. Statutory Authority: RCW 70.98.050. WSR 94-01-073, § 246-243-240, filed 12/9/93, effective 1/9/94. Statutory Authority: RCW 43.70.040. WSR 91-02-049 (Order 121), recodified as § 246-243-240, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 70.98.080. WSR 83-19-050 (Order 2026), § 402-36-165, filed 9/16/83.]

WAC 246-243-250 Appendix C—Radiographer certification. (1) Requirements for an independent certifying organization. An independent certifying organization shall:

- (a) Be an organization such as a society or association, whose members participate in, or have an interest in, the fields of industrial radiography;
- (b) Make its membership available to the general public nationwide that is not restricted because of race, color, religion, sex, age, national origin or disability;
- (c) Have a certification program open to nonmembers, as well as members;
- (d) Be an incorporated, nationally recognized organization that is involved in setting national standards of practice within its fields of expertise;
- (e) Have an adequate staff, a viable system for financing its operations, and a policy- and decision-making review board;
- (f) Have a set of written organizational by-laws and policies that provide adequate assurance of lack of conflict of interest and a system for monitoring and enforcing those by-laws and policies;
- (g) Have a committee, whose members can carry out their responsibilities impartially, to review and approve the certification guidelines and procedures, and to advise the organization's staff in implementing the certification program.
- (h) Have a committee, whose members can carry out their responsibilities impartially, to review complaints against certified individuals and to determine appropriate sanctions;
- (i) Have written procedures describing all aspects of its certification program, maintain records of the current status of each individual's certification and the administration of its certification program;
- (j) Have procedures to ensure that certified individuals are provided due process with respect to the administration of

its certification program, including the process of becoming certified and any sanctions imposed against certified individuals;

(k) Have procedures for proctoring examinations, including qualifications for proctors. These procedures must ensure that the individuals proctoring each examination are not employed by the same company or corporation (or a wholly owned subsidiary of such company or corporation) as any of the examinees;

(l) Exchange information about certified individuals with the department, the US Nuclear Regulatory Commission, other independent certifying organizations or agreement states and allow periodic review of its certification program and related records; and

(m) Provide a description to the department of its procedures for choosing examination sites and for providing an appropriate examination environment.

(2) Requirements for certification programs. All certification programs must:

(a) Require applicants for certification to:

- (i) Receive training in the topics set forth in WAC 246-243-230 or equivalent NRC or agreement state regulations; and

- (ii) Satisfactorily complete a written examination covering these topics;

- (b) Require applicants for certification to provide documentation that demonstrates that the applicant has:

- (i) Received training in the topics set forth in WAC 246-243-230 or equivalent NRC or agreement state regulations;

- (ii) Satisfactorily completed a minimum period of on-the-job training; and

- (iii) Received verification by an agreement state or a NRC licensee that the applicant has demonstrated the capability of independently working as a radiographer;

- (c) Include procedures to ensure that all examination questions are protected from disclosure;

- (d) Include procedures for denying an application, revoking, suspending, and reinstating a certificate;

- (e) Provide a certification period of not less than three years nor more than five years;

- (f) Include procedures for renewing certifications and, if the procedures allow renewals without examination, require evidence of recent full-time employment and annual refresher training;

- (g) Provide a timely response to inquiries, by telephone or letter, from members of the public, about an individual's certification status.

(3) Requirements for written examinations.

All examinations must be:

- (a) Designed to test an individual's knowledge and understanding of the topics listed in WAC 246-243-230 or equivalent NRC or agreement state requirements;

- (b) Written in a multiple-choice format;

- (c) Have test items drawn from a question bank containing psychometrically valid questions based on the material in WAC 246-243-230.

[Statutory Authority: RCW 70.98.050 and 70.98.110. WSR 16-13-054, § 246-243-250, filed 6/10/16, effective 7/11/16. Statutory Authority: RCW 70.98.050. WSR 00-08-013, § 246-243-250, filed 3/24/00, effective 4/24/00.]