PART 34—LICENSES FOR INDUSTRIAL RADIOGRAPHY AND RADIATION SAFETY REQUIREMENTS FOR INDUSTRIAL RADIOGRAPHIC OPERATIONS

Subpart A—General Provisions

§ 34.1 Purpose and scope.
This part prescribes requirements for the issuance of licenses for the use of sealed sources containing byproduct material and radiation safety requirements for persons using these sealed sources in industrial radiography. The provisions and requirements of this part also apply to the conduct of radiographic operations in the performance of permanent radiographic installations established or maintained under the authority of this part.

Subpart B—Specific Licensing Provisions

§ 34.11 Application for a specific license.

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§ 34.41 Conducting industrial radiographic operations.

APPENDIX A TO PART 34—RADIOGRAPHER CERTIFICATION


SOURCE: 62 FR 29963, May 28, 1997, unless otherwise noted.

Subpart A—General Provisions

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part are in addition to, and not in substitu-
tion for, other requirements of
this chapter. In particular, the require-
ments and provisions of 10 parts 19, 20,
21, 30, 71, 150, 170, and 171 of this chap-
ter apply to applications and licenses
subject to this part. This rule does not
apply to medical uses of byproduct ma-
terial.

§ 34.3 Definitions.

ALARA (acronym for ‘as low as is
reasonably achievable’) means making
every reasonable effort to maintain ex-
posures to radiation as far below the
dose limits specified in 10 CFR part 20
as is practical consistent with the pur-
pose for which the licensed activity is
undertaken, taking into account the
state of technology, the economics of
improvements in relation to state of
technology, the economics of improve-
ments in relation to benefits to the
public health and safety, and other so-
cietal and socioeconomic consider-
ations, and in relation to utilization of
nuclear energy and licensed materials
in the public interest.

Annual refresher safety training means
a review conducted or provided by the
licensee for its employees on radiation
safety aspects of industrial radiog-
raphy. The review may include, as ap-
propriate, the results of internal in-
spections, new procedures or equip-
ment, new or revised regulations, acci-
dents or errors that have been ob-
served, and should also provide oppor-
tunities for employees to ask safety
questions.

Associated equipment means equip-
ment that is used in conjunction with
a radiographic exposure device to make
radiographic exposures that drives,
guides, or comes in contact with the
source, (e.g., guide tube, control tube,
control (drive) cable, removable source
stop, ‘‘J’’ tube and collimator when it
is used as an exposure head.

Bequerel (Bq) means one disintegra-
tion per second.

Certifying Entity means an inde-
pendent certifying organization meet-
ing the requirements in appendix A of
this part or an Agreement State meet-
ing the requirements in appendix A,
parts II and III of this part.

Collimator means a radiation shield
that is placed on the end of the guide
tube or directly onto a radiographic ex-
posure device to restrict the size of the
radiation beam when the sealed source
is cranked into position to make a ra-
diographic exposure.

Control (drive) cable means the cable
that is connected to the source assem-
bly and used to drive the source to and
from the exposure location.

Control drive mechanism means a de-
vice that enables the source assembly
to be moved to and from the exposure
device.

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

Exposure head means a device that lo-
cates the gamma radiography sealed
source in the selected working posi-
tion. (An exposure head is also known
as a source stop.)

Field station means a facility where
licensed material may be stored or
used and from which equipment is dis-
patched.

Gray means the SI unit of absorbed
dose. One gray is equal to an absorbed
dose of 1 Joule/kilogram. It is also
equal to 100 rads.

Guide tube (Projection sheath) means a
flexible or rigid tube (i.e., ‘‘J’’ tube) for
guiding the source assembly and the
attached control cable from the expo-
sure device to the exposure head. The
guide tube may also include the con-
nections necessary for attachment to
the exposure device and to the expo-
sure head.

Hands-on experience means experience
in all of those areas considered to be
directly involved in the radiography
process.

Independent certifying organization
means an independent organization
that meets all of the criteria of appen-
dix A to this part.

Industrial radiography (radiography)
means an examination of the structure
of materials by nondestructive meth-
ods, utilizing ionizing radiation to
make radiographic images.

Lay-barge radiography means indus-
trial radiography performed on any
water vessel used for laying pipe.

Offshore platform radiography means
industrial radiography conducted from
a platform over a body of water.
§ 34.3

Permanent radiographic installation means an enclosed shielded room, cell, or vault, not located at a temporary jobsite, in which radiography is performed.

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.

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 §34.42.

Radiographer means any individual who performs or who, in attendance at the site where the sealed source or sources are being used, personally supervises industrial radiographic operations and who is responsible to the licensee for assuring compliance with the requirements of the Commission's regulations and the conditions of the license.

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.

Radiographer's assistant means any individual who under the direct supervision of a radiographer, uses radiographic exposure devices, sealed sources or related handling tools, or radiation survey instruments in industrial radiography.

Radiographic exposure device (also called a camera, or a projector) 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.

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 transport), to include surveys to confirm the adequacy of boundaries, setting up equipment and any activity inside restricted area boundaries.

S-tube means a tube through which the radioactive source travels when inside a radiographic exposure device.

Sealed source means any byproduct material that is encased in a capsule designed to prevent leakage or escape of the byproduct material.

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

Sievert means the SI unit of any of the quantities expressed as dose equivalent. The dose equivalent in sieverts is equal to the absorbed dose in grays multiplied by the quality factor (1 Sv = 100 rems).

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.

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.

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.

Storage container means a container in which sealed sources are secured and stored.

Temporary jobsite means a location where radiographic operations are conducted and where licensed material may be stored other than those location(s) of use authorized on the license.

Underwater radiography means industrial radiography performed when the radiographic exposure device and/or related equipment are beneath the surface of the water.
§ 34.5 Interpretations.

Except as specifically authorized by the Commission in writing, no interpretation of the meaning of the regulations in this part by any officer or employee of the Commission, other than a written interpretation by the General Counsel, will be recognized to be binding upon the Commission.

§ 34.8 Information collection requirements: OMB approval.

(a) The Nuclear Regulatory Commission has submitted the information collection requirements contained in this part to the Office of Management and Budget (OMB) for approval as required by the Paperwork Reduction Act (44 U.S.C. 3501 et seq.). The NRC may nor conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. OMB has approved the information collection requirements contained in this part under control number 3150–0007.

(b) The approved information collection requirements contained in this part appear in §§ 34.13, 34.20, 34.25, 34.27, 34.29, 34.31, 34.33, 34.35, 34.41, 34.42, 34.43, 34.45, 34.47, 34.49, 34.53, 34.61, 34.63, 34.65, 34.67, 34.69, 34.71, 34.73, 34.75, 34.79, 34.81, 34.83, 34.85, 34.87, 34.89, 34.101, and appendix A.

(c) This part contains information collection requirements in addition to those approved under the control number specified in paragraph (a) of this section. The information collection requirements and the control numbers under which it is approved are as follows:

(1) In § 34.11, NRC Form 313 is approved under control number 3150–0120.
(2) [Reserved]


Subpart B—Specific Licensing Provisions

§ 34.11 Application for a specific license.

A person may file an application for specific license for use of sealed sources in industrial radiography on NRC Form 313, “Application for Material License,” in accordance with the provisions of § 30.32 of this chapter.

[68 FR 58805, Oct. 10, 2003]

§ 34.13 Specific license for industrial radiography.

An application for a specific license for the use of licensed material in industrial radiography will be approved if the applicant meets the following requirements:

(a) The applicant satisfies the general requirements specified in § 30.33 of this chapter for byproduct material, as appropriate, and any special requirements contained in this part.

(b) The applicant submits an adequate program for training radiographers and radiographers' assistants that meets the requirements of § 34.43.

(1) After May 28, 1999, a license applicant need not describe its initial training and examination program for radiographers in the subjects outlined in § 34.43(g).

(2) From June 27, 1997 to May 28, 1999 a license applicant may affirm that all individuals acting as industrial radiographers will be certified in radiation safety by a certifying entity before commencing duty as radiographers. This affirmation substitutes for a description of its initial training and examination program for radiographers in the subjects outlined in § 34.43(g).

(c) The applicant submits procedures for verifying and documenting the certification status of radiographers and for ensuring that the certification of individuals acting as radiographers remains valid.

(d) The applicant submits written operating and emergency procedures as described in § 34.45.

(e) The applicant submits a description of a program for inspections of the job performance of each radiographer and radiographers' assistant at intervals not to exceed 6 months as described in § 34.43(e).

(f) The applicant submits a description of the applicant's overall organizational structure as it applies to the radiation safety responsibilities in industrial radiography, including specified delegation of authority and responsibility.
§ 34.20 Performance requirements for industrial radiography equipment.

Equipment used in industrial radiographic operations must meet the following minimum criteria:

(a)(1) 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 has been approved for incorporation by reference by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. This publication may be purchased from the American National Standards Institute, Inc., 1430 Broadway, New York, New York 10018 Telephone (212) 642-4900. Copies of the document are available for inspection at the Nuclear Regulatory Commission Library, 11545 Rockville Pike, Rockville, Maryland 20852. A copy of the document is also on file at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

(a)(2) 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 Commission may find this an acceptable alternative to actual testing of the component pursuant to the above referenced standard.

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

(1) 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.

(2) Radiographic exposure devices intended for use as Type B transport containers must meet the applicable requirements of 10 CFR part 71.

(3) 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.

(c) In addition to the requirements specified in paragraphs (a) and (b) 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.

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

(3) The outlet fittings, lock box, and drive cable fittings 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.

(4)(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—RA-DIOACTIVE."

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

(5) 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 that are likely to be encountered during use.

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

(7) 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 industrial radiography operations.

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

(9) 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.

(d) All radiographic exposure devices and associated equipment in use after January 10, 1996, must comply with the requirements of this section.

(e) Notwithstanding paragraph (a)(1) of this section, 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.

§ 34.21 Limits on external radiation levels from storage containers and source changers.

The maximum exposure rate limits for storage containers and source changers are 2 millisieverts (200 millirem) per hour at any exterior surface, and 0.1 millisieverts (10 millirem) per hour at 1 meter from any exterior surface with the sealed source in the shielded position.

§ 34.23 Locking of radiographic exposure devices, storage containers and source changers.

(a) Each radiographic exposure device must have a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position. The exposure device and/or its container must be kept locked (and if a keyed-lock, with the key removed at all times) when not under the direct surveillance of a radiographer or a radiographer's assistant except at permanent radiographic installations as
§ 34.25 Radiation survey instruments.

(a) The licensee shall keep sufficient calibrated and operable radiation survey instruments at each location where radioactive material is present to make the radiation surveys required by this part and by 10 CFR part 20 of this chapter. Instrumentation required by this section must be capable of measuring a range from 0.02 millisieverts (2 millirems) per hour through 0.01 sievert (1 rem) per hour.

(b) The licensee shall have each radiation survey instrument required under paragraph (a) of this section calibrated—

(1) At intervals not to exceed 6 months and after instrument servicing, except for battery changes;

(2) 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 at two points of at least one decade; and for digital instruments, at 3 points between 0.02 and 10 millisieverts (2 and 1000 millirems) per hour; and

(3) So that an accuracy within plus or minus 20 percent of the calibration source can be demonstrated at each point checked.

(c) The licensee shall maintain records of the results of the instrument calibrations in accordance with § 34.65.
§ 34.33 Permanent radiographic installations.

(a) Each entrance that is used for personnel access to the high radiation area in a permanent radiographic installation must have either:

§ 34.29 Quarterly inventory.

(a) Each licensee shall conduct a quarterly physical inventory to account for all sealed sources and for devices containing depleted uranium received and possessed under this license.

(b) The licensee shall maintain records of the quarterly inventory in accordance with §34.69.

§ 34.31 Inspection and maintenance of radiographic exposure devices, transport and storage containers, associated equipment, source changers, and survey instruments.

(a) 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.

(b) Each licensee shall have written procedures for:

(1) Inspection and routine maintenance of radiographic exposure devices, source changers, associated equipment, transport and storage containers, and survey instruments at intervals not to exceed 3 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.

(2) 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.

(c) Records of equipment problems and of any maintenance performed under paragraphs (a) and (b) of this section must be made in accordance with §34.73.
§ 34.35 Labeling, storage, and transportation.

(a) 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 conventional colors, i.e., magenta, purple or black on a yellow background, having a minimum diameter of 25 mm, and the wording

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

(b) 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 CFR part 71.

(c) 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.

(d) 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.

Subpart D—Radiation Safety Requirements

§ 34.41 Conducting industrial radiographic operations.

(a) 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 §34.43(c). 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.

(b) All radiographic operations conducted at locations of use authorized on the license must be conducted in a permanent radiographic installation, unless specifically authorized by the Commission.

(c) A licensee may conduct lay-barge, offshore platform, or underwater radiography only if procedures have been approved by the Commission or by an Agreement State.

(d) Licensees will have until June 27, 1998, to meet the requirements for having two qualified individuals present at locations other than a permanent radiographic installation as specified in paragraph (a) of this section.

§ 34.42 Radiation Safety Officer for industrial radiography.

The 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.

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

(1) Completion of the training and testing requirements of § 34.43(a);

(2) 2000 hours of hands-on experience as a qualified radiographer in industrial radiographic operations; and

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

(b) The Commission will consider alternatives when the RSO has appropriate training and/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.

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

(1) Establishing and overseeing all operating, emergency, and ALARA procedures as required by 10 CFR part 20 of this chapter, and reviewing them regularly to ensure that the procedures in use conform to current 10 CFR part 20 procedures, conform to other NRC regulations and to the license conditions.

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

(3) 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;

(4) 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 § 20.2203 of this chapter; and

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

(d) Licensees will have until June 27, 1999, to meet the requirements of paragraph (a) or (b) of this section.


§ 34.43 Training.

(a) The licensee may not permit any individual to act as a radiographer until the individual—

(1) Has received training in the subjects in paragraph (g) of this section, in addition to a minimum of 2 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 appendix A of this part. (An independent organization that would like to be recognized as a certifying entity shall submit its request to the Director, Office of Nuclear Material Safety and Safeguards, by an appropriate method listed in § 30.6(a) of this chapter.) or

(2) The licensee may, until June 27, 1999, allow an individual who has not met the requirements of paragraph (a)(1) of this section, to act as a radiographer after the individual has received training in the subjects outlined in paragraph (g) of this section and demonstrated an understanding of these subjects by successful completion of a written examination that was previously submitted to and approved by the Commission.

(b) In addition, the licensee may not permit any individual to act as a radiographer until the individual—

(1) Has received copies of and instruction in the requirements described in NRC regulations contained in this part; in §§ 30.7, 30.9, and 30.10 of this chapter; in the applicable sections of 10 CFR parts 19 and 20, of this chapter, in applicable DOT regulations as referenced in 10 CFR part 71, in the NRC license(s) under which the radiographer will perform industrial radiography, and the licensee's operating and emergency procedures;

(2) Has demonstrated understanding of the licensee's license and operating
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and emergency procedures by successful completion of a written or oral examination covering this material.

(3) 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.

(4) Has demonstrated understanding of the use of radiographic exposure devices, sources, survey instruments and associated equipment described in paragraphs (b)(1) and (b)(3) of this section by successful completion of a practical examination covering this material.

(c) The licensee may not permit any individual to act as a radiographer’s assistant until the individual—

(1) Has received copies of and instruction in the requirements described in NRC regulations contained in this part, in §§ 30.7, 30.9, and 30.10 of this chapter, in the applicable sections of 10 CFR parts 19 and 20 of this chapter, in applicable DOT regulations as referenced in 10 CFR part 71, in the NRC license(s) under which the radiographer’s assistant will perform industrial radiography, and the licensee’s operating and emergency procedures;

(2) Has developed competence to use, under the personal supervision of the radiographer, the radiographic exposure devices, sealed sources, associated equipment, and radiation survey instruments that the assistant will use; and

(3) Has demonstrated understanding of the instructions provided under (c)(1) of this section by successfully completing a written test on the subjects covered and has demonstrated competence in the use of hardware described in (c)(2) of this section by successful completion of a practical examination on the use of such hardware.

(d) The licensee shall provide annual refresher safety training for each radiographer and radiographer’s assistant at intervals not to exceed 12 months.

(e) Except as provided in paragraph (e)(4), the RSO or designee shall conduct an inspection program of the job performance of each radiographer and radiographer’s assistant to ensure that the Commission’s regulations, license requirements, and the applicant’s operating and emergency procedures are followed. The inspection program must:

(1) Include observation of the performance of each radiographer and radiographer’s assistant during an actual industrial radiographic operation, at intervals not to exceed 6 months; and

(2) Provide that, if a radiographer or a radiographer’s assistant has not participated in an industrial radiographic operation for more than 6 months since the last inspection, the radiographer must demonstrate knowledge of the training requirements of §34.43(b)(3) and the radiographer’s assistant must re-demonstrate knowledge of the training requirements of §34.43(c)(2) by a practical examination before these individuals can next participate in a radiographic operation.

(3) The Commission may consider alternatives in those situations where the individual serves as both radiographer and RSO.

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

(f) The licensee shall maintain records of the above training to include certification documents, written and practical examinations, refresher safety training and inspections of job performance in accordance with §34.79.

(g) The licensee shall include the following subjects required in paragraph (a) of this section:

(1) Fundamentals of radiation safety including—

(i) Characteristics of gamma radiation;

(ii) Units of radiation dose and quantity of radioactivity;

(iii) Hazards of exposure to radiation;

(iv) Levels of radiation from licensed material; and

(v) Methods of controlling radiation dose (time, distance, and shielding);

(2) Radiation detection instruments including—

(i) Use, operation, calibration, and limitations of radiation survey instruments;

(ii) Survey techniques; and
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§ 34.47 Personnel monitoring.

(iii) Use of personnel monitoring equipment;

(3) Equipment to be used including—

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

(ii) Storage, control, and disposal of licensed material; and

(iii) Inspection and maintenance of equipment.

(4) The requirements of pertinent Federal regulations; and

(5) Case histories of accidents in radiography.

(h) Licensees will have until June 27, 1998, to comply with the additional training requirements specified in paragraphs (b)(1) and (c)(1) of this section.

(i) Licensees will have until June 27, 1999, to comply with the certification requirements specified in paragraph (a)(1) of this section. Records of radiographer certification maintained in accordance with §34.79(a) provide appropriate affirmation of certification requirements specified in paragraph (a)(1) of this section.


§ 34.45 Operating and emergency procedures.

(a) Operating and emergency procedures must include, as a minimum, instructions in the following:

(1) Appropriate handling and use of licensed sealed sources and radiographic exposure devices so that no person is likely to be exposed to radiation doses in excess of the limits established in 10 CFR part 20 of this chapter “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 radiographic exposure devices, transport and storage containers and sealed sources;

(5) Personnel monitoring and the use of personnel monitoring equipment;

(6) Transporting sealed sources to field locations, including packing of radiographic exposure devices and storage containers in the vehicles, placarding of vehicles when needed, and control of the sealed sources during transportation (refer to 49 CFR parts 171-173);

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

(8) Steps that must be taken immediately by radiography personnel in the event a pocket dosimeter is found to be off-scale or an alarm ratemeter alarms unexpectedly.

(9) The procedure(s) for identifying and reporting defects and noncompliance, as required by 10 CFR part 21 of this chapter;

(10) The procedure for notifying proper persons in the event of an accident;

(11) Minimizing exposure of persons in the event of an accident;

(12) Source recovery procedure if licensee will perform source recovery;

(13) Maintenance of records.

(b) The licensee shall maintain copies of current operating and emergency procedures in accordance with §§34.81 and 34.89.

§ 34.46 Supervision of radiographers’ assistants.

Whenever a radiographer’s assistant uses radiographic exposure devices, associated equipment or sealed sources or conducts radiation surveys required by §34.49(b) to determine that the sealed source has returned to the shielded position after an exposure, the assistant shall be under the personal supervision of a radiographer. The personal supervision must include:

(a) The radiographer’s physical presence at the site where the sealed sources are being used;

(b) The availability of the radiographer to give immediate assistance if required; and

(c) The radiographer’s direct observation of the assistant’s performance of the operations referred to in this section.

§ 34.47 Personnel monitoring.

(a) The licensee may not permit any individual to act as a radiographer or a radiographer’s assistant unless, at all
times during radiographic operations, each individual wears, on the trunk of
the body, a direct reading dosimeter, an operating alarm ratemeter, and a
personnel dosimeter that is processed and evaluated by an accredited Na-
tional Voluntary Laboratory Accreditation Program (NVLAP) processor. At
permanent radiography installations where other appropriate alarming or
warning devices are in routine use, the wearing of an alarming ratemeter is
not required.
(1) Pocket dosimeters must have a
range from zero to 2 millisieverts (200
millirems) and must be recharged at
the start of each shift. Electronic per-
sonal dosimeters may only be used in
place of ion-chamber pocket
dosimeters.
(2) Each personnel dosimeter must be
assigned to and worn only by one indi-
vidual.
(3) 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.
(4) After replacement, each personnel
dosimeter must be processed as soon as
possible.
(b) Direct reading dosimeters such as
pocket dosimeters or electronic per-
sonal dosimeters, must be read and the
exposures recorded at the beginning
and end of each shift, and records must
be maintained in accordance with § 34.83.
(c) Pocket dosimeters, or electronic
personal dosimeters, must be checked
at periods not to exceed 12 months for
correct response to radiation, and
records must be maintained in accordance with § 34.83.
(d) If an individual’s pocket chamber
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 radia-
tion exposure cannot be ruled out as
the cause, the individual’s personnel
dosimeter must be sent for processing
within 24 hours. In addition, the indi-
vidual may not resume work associated
with licensed material use until a de-
termined by the RSO
or the RSO’s designee. The results of
this determination must be included in
the records maintained in accordance with § 34.83.
(e) If the personnel dosimeter that is
required by paragraph (a) of this sec-
tion is lost or damaged, the worker
shall cease work immediately until a
replacement personnel dosimeter meet-
ing the requirements in paragraph (a)
is provided and the exposure is cal-
culated for the time period from
issuance to loss or damage of the per-
sonnel dosimeter. The results of the
calculated exposure and the time pe-
riod for which the personnel dosimeter
was lost or damaged must be included in
the records maintained in accordance with § 34.83.
(f) Dosimetry reports received from
the accredited NVLAP personnel do-
simeter processor must be retained in
accordance with § 34.83.
(g) Each alarm ratemeter must—
(1) Be checked to ensure that the
alarm functions properly (sounds) be-
fore using at the start of each shift;
(2) Be set to give an alarm signal at
a preset dose rate of 5 mSv/hr (500
mrem/hr); with an accuracy of plus or
minus 20 percent of the true radiation
doise rate;
(3) Require special means to change
the preset alarm function; and
(4) Be calibrated at periods not to ex-
ceed 12 months for correct response to
radiation. The licensee shall maintain
records of alarm ratemeter calibra-
tions in accordance with § 34.83.
FR 63751, Oct. 24, 2000]
§ 34.49 Radiation surveys.
The licensee shall:
(a) Conduct surveys with a calibrated
and operable radiation survey instru-
ment that meets the requirements of
§ 34.25.
(b) Using a survey instrument meet-
ing the requirements of paragraph (a)
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 must determine that
the sealed source has returned to its
shielded position before exchanging

films, repositioning the exposure head, or dismantling equipment.

(c) 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 (as defined in §34.3), to ensure that the sealed source is in its shielded position.

(d) Maintain records in accordance with §34.85.

§ 34.51 Surveillance.

During each radiographic operation the radiographer, or the other individual present, as required by §34.41, shall maintain continuous direct visual surveillance of the operation to protect against unauthorized entry into a high radiation area, as defined in 10 CFR part 20 of this chapter, except at permanent radiographic installations where all entryways are locked and the requirements of §34.33 are met.

§ 34.53 Posting.

All areas in which industrial radiography is being performed must be conspicuously posted as required by §20.1902(a) and (b) of this chapter. Exceptions listed in §20.1903 of this chapter do not apply to industrial radiographic operations.


Subpart E—Recordkeeping Requirements

§ 34.61 Records of the specific license for industrial radiography.

Each licensee shall maintain a copy of its license, license conditions, documents incorporated by reference, and amendments to each of these items until superseded by new documents approved by the Commission, or until the Commission terminates the license.

§ 34.63 Records of receipt and transfer of sealed sources.

(a) Each licensee shall maintain records showing the receipts and transfers of sealed sources and devices using DU for shielding and retain each record for 3 years after it is made.

(b) These records must include the date, 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 and/or device, as appropriate.

§ 34.65 Records of radiation survey instruments.

Each licensee shall maintain records of the calibrations of its radiation survey instruments that are required under §34.25 and retain each record for 3 years after it is made.

§ 34.67 Records of leak testing of sealed sources and devices containing depleted uranium.

Each licensee shall maintain records of leak test results for sealed sources and for devices containing DU. The results must be stated in units of Becquerels (microcuries). The licensee shall retain each record for 3 years after it is made or until the source in storage is removed.

§ 34.69 Records of quarterly inventory.

(a) Each licensee shall maintain records of the quarterly inventory of sealed sources and of devices containing depleted uranium as required by §34.29 and retain each record for 3 years after it is made.

(b) The record must include the date of the inventory, name of the individual conducting the inventory, radionuclide, number of Becquerels (curies) or mass (for DU) in each device, location of sealed source and/or devices, and manufacturer, model, and serial number of each sealed source and/or device, as appropriate.

§ 34.71 Utilization logs.

(a) Each licensee shall maintain utilization logs showing for each sealed source the following information:

1. A description, including the make, model, and serial number of the radiographic exposure device or transport or storage container in which the sealed source is located;
2. The identity and signature of the radiographer to whom assigned; and
3. The plant or site where used and dates of use, including the dates removed and returned to storage.
§ 34.73 Records of inspection and maintenance of radiographic exposure devices, transport and storage containers, associated equipment, source changers, and survey instruments.

(b) The licensee shall retain the logs required by paragraph (a) of this section for 3 years after the log is made.

§ 34.81 Copies of operating and emergency procedures.

Each licensee shall maintain a copy of current operating and emergency procedures until the Commission terminates the license. Superseded material must be retained for 3 years after the change is made.

§ 34.83 Records of personnel monitoring procedures.

Each licensee shall maintain the following exposure records specified in § 34.47:

(a) Direct reading dosimeter readings and yearly operability checks required by § 34.47(b) and (c) for 3 years after the record is made.

(b) Records of alarm ratemeter calibrations for 3 years after the record is made.

(c) Personnel dosimeter results received from the accredited NVLAP processor until the Commission terminates the license.

(d) Records of estimates of exposures as a result of off-scale personal direct reading dosimeters, or lost or damaged personnel dosimeters until the Commission terminates the license.

§ 34.85 Records of radiation surveys.

Each licensee shall maintain a record of each exposure device survey conducted before the device is placed in storage as specified in § 34.49(c), if that survey is the last one performed in the workday. Each record must be maintained for 3 years after it is made.

§ 34.87 Form of records.

Each record required by this part 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.

§ 34.89 Location of documents and records.

(a) Each licensee shall maintain copies of records required by this part and other applicable parts of this chapter at the location specified in §34.13(k).

(b) Each licensee shall also maintain copies of the following documents and records sufficient to demonstrate compliance at each applicable field station and each temporary jobsite:

1. The license authorizing the use of licensed material;
2. A copy of 10 CFR parts 19, 20, and 34 of NRC regulations;
3. Utilization records for each radiographic exposure device dispatched from that location as required by §34.71.
4. Records of equipment problems identified in daily checks of equipment as required by §34.73(a);
5. Records of alarm system and entrance control checks required by §34.75, if applicable;
6. Records of direct reading dosimeters such as pocket dosimeter and/or electronic personal dosimeters readings as required by §34.83;
7. Operating and emergency procedures required by §34.81;
8. Evidence of the latest calibration of the radiation survey instruments in use at the site, as required by §34.65;
9. Evidence of the latest calibrations of alarm ratemeters and operability checks of pocket dosimeters and/or electronic personal dosimeters as required by §34.83;
10. Latest survey records required by §34.85;
11. The shipping papers for the transportation of radioactive materials required by §71.5 of this chapter; and
12. When operating under reciprocity pursuant to §150.20 of this chapter, a copy of the Agreement State license authorizing the use of licensed materials.

§ 34.101 Notifications.

(a) In addition to the reporting requirements specified in §30.50 and under other sections of this chapter, such as §21.21, each licensee shall send a written report to the NRC's Office of Nuclear Material Safety and Safeguards, Division of Industrial and Medical Nuclear Safety, by an appropriate method listed in §30.6(a) of this chapter, within 30 days of the occurrence of any of the following incidents involving radiographic equipment:

1. Unintentional disconnection of the source assembly from the control cable;
2. Inability to retract the source assembly to its fully shielded position and secure it in this position; or
3. Failure of any component (critical to safe operation of the device) to properly perform its intended function;

(b) The licensee shall include the following information in each report submitted under paragraph (a) of this section, and in each report of overexposure submitted under 10 CFR 20.2203 which involves failure of safety components of radiography equipment:

1. A description of the equipment problem;
2. Cause of each incident, if known;
3. Name of the manufacturer and model number of equipment involved in the incident;
4. Place, date, and time of the incident;
5. Actions taken to establish normal operations;
6. Corrective actions taken or planned to prevent recurrence; and
7. Qualifications of personnel involved in the incident.

(c) Any licensee conducting radiographic operations or storing radioactive material at any location not listed on the license for a period in excess of 180 days in a calendar year, shall notify the appropriate NRC regional office listed in §30.6(a)(2) of this chapter prior to exceeding the 180 days.

§ 34.111

Subpart G—Exemptions

§ 34.111 Applications for exemptions.

The Commission may, upon applica-
tion of any interested person or upon
its own initiative, grant an exemption
from the requirements of the regula-
tions in this part if it determines the
exemption is authorized by law and
would not endanger life or property or
the common defense and security and
is otherwise in the public interest.

Subpart H—Violations

§ 34.121 Violations.

(a) The Commission may obtain an
injunction or other court order to pre-
vent a violation of the provisions of—
(1) The Atomic Energy Act of 1954, as
amended;
(2) Title II of the Energy Reorganiza-
tion Act of 1974, as amended; or
(3) A regulation or order issued pur-
suant to these Acts.

(b) The Commission may obtain a
court order for the payment of a civil
penalty imposed under Section 234 of
the Atomic Energy Act;
(1) For violations of—
(i) Sections 53, 57, 62, 63, 81, 82, 101,
103, 104, 107, or 109 of the Atomic En-
ergy Act of 1954, as amended;
(ii) Section 206 of the Energy Reorga-
nization Act;
(iii) Any rule, regulation, or order
issued pursuant to the sections speci-
fied in paragraph (b)(1)(i) of this sec-
tion.
(iv) Any term, condition, or limita-
tion of any license issued under the
sections specified in paragraph (b)(1)(i)
of this section.
(2) For any violation for which a li-
cense may be revoked under section 186
of the Atomic Energy Act of 1954, as
amended.

§ 34.123 Criminal penalties.

(a) Section 223 of the Atomic Energy
Act of 1952, as amended, provides for
criminal sanctions for willful violation
of, attempted violation of, or con-
spiracy to violate, any regulation
issued under one or more of §§ 161b,
161i, or 161o of the Act. For purposes of
Section 223, all the regulations in 10 CFR
part 34 are issued under one or more of
§§ 161b, 161i, or 161o, except for the sec-
tions listed in paragraph (b) of this sec-
tion.

(b) The regulations in 10 CFR part 34
that are not issued under sections 161b,
161i, or 161o for the purposes of Section
223 are as follows: §§ 34.1, 34.3, 34.5, 34.8,
34.11, 34.13, 34.111, 34.121, 34.123.

Appendix A to Part 34—Radiographer
Certification

I. Requirements for an Independent
Certifying Organization

An independent certifying organization
shall:
1. Be an organization such as a society or
association, whose members participate in,
or have an interest in, the fields of industrial
radiography;
2. Make its membership available to the
general public nationwide that is not re-
stricted because of race, color, religion, sex,
age, national origin or disability;
3. Have a certification program open to
nonmembers, as well as members;
4. Be an incorporated, nationally recog-
nized organization, that is involved in set-
ing national standards of practice within its
fields of expertise;
5. Have an adequate staff, a viable system
for financing its operations, and a policy-and
decision-making review board;
6. Have a set of written organizational by-
laws and policies that provide adequate as-
surance of lack of conflict of interest and a
system for monitoring and enforcing those
by-laws and policies;
7. 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 cer-
tification program;
8. Have a committee, whose members can
carry out their responsibilities impartially,
to review complaints against certified indi-
viduals and to determine appropriate sanc-
tions;
9. Have written procedures describing all
aspects of its certification program, main-
tain records of the current status of each in-
dividual's certification and the administra-
tion of its certification program;
10. Have procedures to ensure that certified
individuals are provided due process with re-
spect to the administration of its certifi-
cation program, including the process of be-
coming certified and any sanctions imposed
against certified individuals;
11. Have procedures for proctoring exami-
nations, including qualifications for pro-
tors. These procedures must ensure that the
individuals proctoring each examination are
not employed by the same company or cor-
poration (or a wholly-owned subsidiary of
such company or corporation) as any of the examinees;
12. Exchange information about certified individuals with the Commission and other independent certifying organizations and/or Agreement States and allow periodic review of its certification program and related records; and
13. Provide a description to the Commission of its procedures for choosing examination sites and for providing an appropriate examination environment.

II. REQUIREMENTS FOR CERTIFICATION PROGRAMS
All certification programs must:
1. Require applicants for certification to (a) receive training in the topics set forth in §34.43(g) or equivalent Agreement State regulations, and (b) satisfactorily complete a written examination covering these topics;
2. Require applicants for certification to provide documentation that demonstrates that the applicant has: (a) received training in the topics set forth in §34.43(g) or equivalent Agreement State regulations; (b) satisfactorily completed a minimum period of on-the-job training; and (c) has received verification by an Agreement State or a NRC licensee that the applicant has demonstrated the capability of independently working as a radiographer;
3. Include procedures to ensure that all examination questions are protected from disclosure;
4. Include procedures for denying an application, revoking, suspending, and reinstating a certificate;
5. Provide a certification period of not less than 3 years nor more than 5 years;
6. Include procedures for renewing certifications and, if the procedures allow renewals without examination, require evidence of recent full-time employment and annual refresher training.
7. Provide a timely response to inquiries, by telephone or letter, from members of the public, about an individual’s certification status.

III. REQUIREMENTS FOR WRITTEN EXAMINATIONS
All examinations must be:
1. Designed to test an individual’s knowledge and understanding of the topics listed in §34.43(g) or equivalent Agreement State requirements;
2. Written in a multiple-choice format;
3. Have test items drawn from a question bank containing psychometrically valid questions based on the material in §34.43(g).