

AE07-1018

JAN 25 1993 PDR

MEMORANDUM FOR: John E. Glenn, Chief, IMNS/NMSS

FROM: Donald A. Cool, Chief, RPHEB/DRA/RES

SUBJECT: REVIEW OF DRAFT REVISION TO PART 34, RADIOGRAPHY

Enclosed is a draft revision to Part 34 which incorporates comments received by the Agreement States at the November 16 and 17, 1992 workshop in Dallas, Texas. In order to meet the Commission deadline of March 31, 1993 for this rule and provide sufficient time for an Agreement States review, I am sending a draft which only includes a portion of the statements of consideration along with the proposed rule.

The format of this draft rule is similar to Part 39. A copy of the table of contents comparing the old and new rule is included. In addition, the proposed rule text is highlighted. We would propose to meet with your staff sometime in the next 2 weeks to review your comments and resolve any problems prior to submitting a complete rulemaking package for office review, which I anticipate doing by March 15, 1993. Significant comments from the Agreement States received by March 15, 1993, will be addressed.

Original Signed By:

Donald A. Cool, Chief
 Radiation Protection and
 Health Effects Branch
 Division of Regulatory Applications
 Office of Nuclear Regulatory Research

Enclosures:

1. Comparison of Old and New Rule
2. Draft Revision to Part 34

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ENCLOSURE 1

COMPARATIVE RULE TEXT

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PROPOSED RULE

PART 34 -- LICENSES AND RADIATION
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See § 34.43(d).

See § 34.4.

See § 34.30.

See § 34.51.

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See § 34.63

Authority: Secs. 81, 161, 182, 183, 68 Stat. 935, 948, 953, 954, as amended (42 U.S.C. 2111, 2201, 2232, 2233); sec. 201, 88 Stat. 1242, as amended (42 U.S.C. 5841).

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Authority: Secs. 81, 161, 182, 183, 68 Stat. 935, 948, 953, 954, as amended (42 U.S.C. 2111, 2201, 2232, 2233); sec. 201, 88 Stat. 1242, as amended (42 U.S.C. 5841).

5846).

For the purposes of sec. 223, 68 Stat. 958, as amended (42 U.S.C. 2273); Section 34.20(a)-(e), 34.21 (a) and (b), 34.22, 34.23, 34.24, 34.25 (a), (b), and (d), 34.28, 34.29, 34.31 (a) and (b), 34.32, 34.33 (a), (c), (d), and (f), 34.41, 34.42, 34.43 (a), (b), and (c) and 34.44 are issued under sec. 161b, 68 Stat. 948, as amended (42 U.S.C. 2201(b)); and Section 34.11(d), 34.25 (c) and (d), 34.26, 34.27, 34.28(b), 34.29(c), 34.30, 34.31(c), 34.33 (b) and (e) and 34.43(d) are issued under sec. 161o, 68 Stat. 950, as amended (42 U.S.C. 2201(o)).

Section 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 such sealed sources in radiography. The provisions and requirements of this part are in addition to, and not in substitution for, other requirements of this chapter. In particular, the provisions of Part 30 of this chapter apply to applications and licenses subject to this part. Nothing in this part shall apply to uses of byproduct material for medical diagnosis or therapy.

Section 34.2 Definitions.

As used in this part:

Subpart A -- General Provisions

Section 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 are in addition to, and not in substitution for, other requirements of this chapter. In particular, the requirements and provisions of Parts 19, 20, 21, 30, 71, 150, 170, and 171 of this chapter apply to applications and licenses subject to this part. This rule does not apply to medical uses of byproduct material.

Section 34.3 Definitions.

As used in this part:

ALARA (acronym for as low as reasonably achievable) means making every reasonable effort to maintain exposures to radiation as far below the dose limits specified in Part 20

as is practical consistent with the purpose 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 improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

Annual safety review means a review conducted or provided by the licensee for its employees on radiation safety aspects of radiography. The review may include, as appropriate, the results of internal inspections, new procedures or equipment, accidents or errors that have been observed, and opportunities for employees to ask safety questions.

Associated equipment means equipment 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 (crank-out device), removable source stop, "J" tube).

Becquerel (Bq) means one disintegration per second.

Certifying entity means an independent certifying organization or an Agreement State meeting the requirements in Appendix A, Parts II and III.

Collimator means a device used to limit the size, shape, and direction of the primary radiation beam.

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 locates the gamma radiography

sealed source in the selected working position. (An exposure head is also known as a source stop.)

Field examination means a demonstration through practical application of the safety rules and principles in radiography including use of all appropriate equipment and procedures.

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

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.

Independent certifying organization means an independent organization that meets the criteria of Appendix A of this part.

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

Projection sheath (guide tube) means a flexible or rigid tube (i.e., "J" tube) for guiding the source assembly and the attached control cable from the radiographic exposure device to the exposure head or working position.

Radiation Safety Officer means an individual named by the licensee who has knowledge of, responsibility for, and authority to ensure compliance with appropriate radiation protection rules, standards, and practices on behalf of the licensee and who meets the requirements of § 34.42.

Radiographer means any individual who meets the requirements of 34.43, is in attendance at the site where the sealed source or sources are being used, personally supervises radiographic operations and who is responsible to the licensee for

“Permanent radiographic installation” means a shielded installation or structure designed or intended for radiography and in which radiography is regularly performed.

“Radiographer” means any individual who performs or who, in attendance at the site where the sealed source or sources are being used, personally supervises 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’s assistant” means any individual who under the personal supervision of a radiographer, uses radiographic exposure devices, sealed sources or related handling tools, or radiation survey instruments in radiography;

“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;

“Radiography” means the examination of the structure of materials by nondestructive methods, utilizing sealed sources of byproduct materials;

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

ensuring 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 training, testing, and experience criteria.

Radiographer’s assistant means any individual, who under the personal supervision of a radiographer, uses radiographic exposure devices, sealed sources or related handling tools, or radiation survey instruments in 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 transport and use of the device, to include surveys to confirm the adequacy of boundaries, setting up equipment and any activity inside restricted area boundaries.

Radiography means the examination of the structure of materials by nondestructive methods, utilizing sealed sources of byproduct materials.

S-tube means a tube (typically made of a hard metal, such as, titanium) through which the radioactive source travels in 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. (In this position the radiation exposure will be at a minimum. This position incorporates maximum shielding for the radioactive source.)

Sievert means the SI unit of any of the quantities expressed as dose equivalent. The absorbed dose in grays multiplied by the quality factor is equal to the dose equivalent in Sieverts. For comparison 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.

“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, to transport, 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 device in which sealed sources are transported or stored.

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 device in which sealed sources are stored.

Temporary jobsite means a place where radiographic operations are conducted other than the location(s) of use authorized on the license.

Section 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 office or employee of the Commission, other than a written interpretation by the General Counsel, will be recognized to be binding upon the Commission.

Section 34.3 Applications for specific licenses.

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

See § 34.11.

Section 34.4 Maintenance of records.

Each record required by this part must be legible throughout the retention period specified by each Commission regulation. The record may be the original of a reproduced copy of a microform provided that the copy or microform is authenticated by authorized personnel and that the microform is capable of producing 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, 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.

See § 34.87.

Section 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 of 1980 (44 U.S.C. 3501 et seq.). 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 Section 34.11, 34.24, 34.25, 34.26, 34.27, 34.28, 34.29, 34.31, 34.32, 34.33, and 34.43.

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

(1) In Section 34.3, Form NRC-313R is approved under control number 3150-0023.

Subpart A -- Specific Licensing Requirements

See § 34.3.

Section 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 of 1980 (44 U.S.C. 3501 et seq.). 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, 35.41, 34.43, 34.45, 34.47, 34.49, 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, 34.91, 34.101, 34.111, 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 requirement and the control number under which it is approved are as follows:

(1) In § 34.11, NRC Form 313 is approved under control number 3150-0120.

Subpart B -- Specific Licensing Requirements

Section 34.11 Application for a specific license.

A person may file an application for specific license for use of sealed sources in radiography, in duplicate, on NRC

Form 313, "Application for Material License," in accordance with the provisions of § 30.32 of this chapter.

Section 34.11 Issuance of specific licenses for use of sealed sources in radiography.

An application for a specific license for use of sealed sources in radiography will be approved if:

(a) The applicant satisfies the general requirements specified in Section 30.33 of this chapter;

(b) The applicant will have an adequate program for training radiographers and radiographers' assistants and submits to the Commission a schedule or description of such program which specifies the:

- (1) Initial training;
- (2) Periodic training;
- (3) On-the-job training;

(4) Means to be used by the licensee to determine the radiographer's knowledge and understanding of and ability to comply with Commission regulations and licensing requirements, and the operating and emergency procedures of the applicant; and (See § 34.11(b)(6).)

See § 34.11(c).

Section 34.13 Specific license for radiography.

The Commission will approve an application for a specific license for the use of licensed material in radiography if the applicant meets the following requirements:

(a) The applicant shall satisfy 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 shall develop an adequate program for training radiographers and radiographers' assistants that meets the requirements of § 34.43, and submit to the Commission a description of this program which specifies the --

(1) Initial training;

(2) On-the-job training;

(3) Annual safety reviews; and

(4) Means the applicant will

use to demonstrate the radiographer's and radiographer's assistant's knowledge and understanding of and ability to comply with the Commission's regulations and licensing requirements and the applicant's operating and emergency procedures.

(c) The applicant shall establish and submit to the Commission a description of its procedures for verifying and documenting the certification status of its radiographers and for ensuring that the certification of individuals acting as radiographers remains valid.

(d) The applicant shall submit to the Commission written operating

See § 34.11(d).

See § 34.11(e).

(5) In lieu of describing its initial training program for radiographers in the subjects outlined in Appendix A of this part, and the description of and the means to determine the radiographer's knowledge and understanding of these subjects, the applicant affirms that all individuals acting as radiographers will be certified in radiation safety through the Certification Program for Industrial Radiography Radiation Safety Personnel of the American Society for Nondestructive Testing, Inc. (ASNT-IRRSP) prior to commencing duties as radiographers. From April 18, 1991, to the date of the renewal of an existing license, an approved license application is deemed to include the option, for individuals who are certified in radiation safety through the ASNT-IRRSP, to substitute ASNT-IRRSP certification in lieu of the described means to determine a radiographer's knowledge and understanding of the subjects in 34.31(a)(1). (This paragraph does not affect the licensee's responsibility to assure that radiographers are properly trained in accordance with § 34.31(a)).

(6) Means to be used by the licensee to determine the

and emergency procedures as described in § 34.45.

(e) The applicant shall establish and submit to the Commission its program for annual inspections of the job performance of each radiographer and radiographer's assistant as described in § 34.43(d).

(f) The applicant shall submit a description of its overall organizational structure as it applies to the radiation safety responsibilities in radiography, including specified delegations of authority and responsibility.

See § 34.13(b)(4).

radiographer's assistant's knowledge and understanding of and ability to comply with the operating and emergency procedures of the applicant;

(c) The applicant has established and submits to the Commission satisfactory written operating and emergency procedures as described in Section 34.32;

See § 34.13(d).

(d) The applicant has established and submits to the Commission a description of its inspection program adequate to ensure that its radiographers and radiographers' assistants follow the Commission's regulatory requirements and the applicant's operating and emergency procedures. The inspection program must:

See § 34.13(e).

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

(2) Provide that, if a radiographer or a radiographer's assistant has not participated in a radiographic operation for more than three months since the last inspection, that individual's performance must be observed and recorded the next time the individual participates in a radiographic operation; and

(3) Include the retention of inspection records on the performance of radiographers or radiographers' assistants for three years.

(e) The applicant submits a description of its over-all organizational structure pertaining to the radiography program, including specified delegations of authority and responsibility for operation of the program; and

See § 34.13(f).

(g) The applicant shall designate and identify a Radiation Safety Officer responsible for implementing the licensee's radiation safety program. The Radiation Safety Officer shall meet the qualifications and duties described in § 34.42.

(f) The applicant who desires to conduct his own leak tests has established adequate procedures to be followed in leak testing sealed sources, for possible leakage and contamination and submits to the Commission a description of such procedures including:

- (1) Instrumentation to be used,
- (2) Method of performing test, e.g., points on equipment to be smeared and method of taking smear, and
- (3) Pertinent experience of the person who will perform the test.

(h) If an applicant intends to perform leak testing of sealed sources, the applicant shall identify the manufacturers and the model numbers of the leak test kits to be used. If the applicant intends to analyze its own wipe samples, the applicant shall establish procedures to be followed and submit a description of these procedures to the Commission. The description must include the --

- (1) Instruments to be used;
- (2) Methods of performing the analysis; and

(3) Pertinent experience of the person who will analyze the wipe samples.

(i) The applicant shall identify the location(s) of, and describe, all field stations and permanent radiographic installations.

(j) From (insert effective date of final rule) to (2 years after the final rule is published in the Federal Register):

(1) A license applicant may affirm that all individuals acting as radiographers will be certified in radiation safety by a certifying entity before commencing duties as radiographers. This affirmation is instead of describing its initial training program for radiographers in the subjects outlined in § 34.43(f), and the means used to determine the radiographer's knowledge and understanding of these subjects, and;

(2) A licensee may substitute radiographer certification in place of the description of the means to determine the radiographer's knowledge and understanding of the subjects outlined in § 34.43(f).

(3) After (2 years after the final rule is published in the Federal Register), a license applicant and licensee shall comply with the requirement of § 34.43(a)(2).

Subpart B --
Radiation Safety Requirements

EQUIPMENT CONTROL

Section 34.20 Performance requirements for radiography equipment.

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

(a) Each radiographic exposure device and all associated equipment must meet the requirements specified in American National Standard 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). This publication may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 and 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 Public Document Room, 2120 L Street NW., Lower Level, Washington, DC 20555. A copy of the document is also on file at the

Subpart C - - Equipment

Section 34.20 Performance requirements for radiography equipment.

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

(a) Each radiographic exposure device and all associated equipment must meet the requirements specified in American National Standard 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). This publication may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 and 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, 7920 Norfolk Avenue, Lower Level, Bethesda, Maryland, 20814. A copy of the

Office of the Federal Register, 1100 L Street NW., Room 8301, Washington, DC 20408.

(b) In addition to the requirements specified in paragraph (a) of this section, the following requirements apply to radiographic exposure devices and associated equipment.

(1) Each radiographic exposure device must have attached to it by the user, 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 number and serial number of the sealed source;

(iv) Manufacturer 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 any exposure devices 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 and associated equipment that allow the source to be moved out of the device for routine operation.

(1) The coupling between the source assembly and the control

document is also on file at the Office of the Federal Register, 800 North Capitol Street NW., Washington, DC 20408.

(b) In addition to the requirements specified in paragraph (a) of this section, the following requirements apply to radiographic exposure devices and associated equipment.

(1) Each radiographic exposure device must have attached to it by the user, 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 number and serial number of the sealed source;

(iv) Manufacturer 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 and associated equipment is prohibited.

(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 routine operation.

(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) Each sealed source or source assembly must have attached to it or engraved in it, a durable, legible, visible label with the words:

"DANGER -- RADIOACTIVE." The label must not interfere with the safe operation of the exposure device or associated equipment.

(5) The guide tube must have passed the crushing tests for the control tube as specified in ANSI N432 and a kinking resistance test that closely approximates the kinking forces 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 radiographic

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) 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."
The label must not interfere with the safe operation of the exposure device or associated equipment.

(5) The guide tube must have passed the crushing tests for the control tube as specified in ANSI N432 and a kinking resistance test that closely approximates the kinking forces 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

operations.

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

(9) Source changers must provide a system for assuring 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 newly manufactured radiographic exposure devices and associated equipment acquired by licensees after January 10, 1992 must comply with the requirements of this section.

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

Section 34.21 Limits on levels of radiation for radiographic exposure devices and storage containers.

(a) Radiographic exposure devices measuring less than four (4) inches from the sealed source storage position to any exterior surface of the device shall have no radiation level in excess of 50 milliroentgens per hour at six (6) inches from any exterior surface of the device. Radiographic exposure devices measuring a minimum of four (4) inches from the sealed source storage position to any exterior surface of the device, and all storage containers for sealed sources or for radiographic

guide tube during radiographic operations.

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

(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 newly manufactured radiographic exposure devices and associated equipment acquired by licensees after January 10, 1992, must comply with the requirements of this section.

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

(f) All associated equipment acquired after January 10, 1996, must be labelled identifying that the components have met the requirements of this section.

Section 34.21 Limits on levels of radiation for radiographic exposure devices, storage containers, and source changers.

(a) Radiographic exposure devices measuring less than 10 centimeters (4 inches) from the sealed source storage position to any exterior surface of the device must not have a radiation level in excess of 0.5 millisieverts (50 millirems) per hour at 15 centimeters (6 inches) from any exterior surface of the device. Radiographic exposure devices measuring a minimum of 10 centimeters (4 inches) from the sealed source storage position to any exterior surface of the device,

exposure devices, shall have no radiation level in excess of 200 milliroentgens per hour at any exterior surface, and ten (10) milliroentgens per hour at one meter from any exterior surface. The radiation levels specified are with the sealed source in the shielded (i.e., "off") position.

(b) Paragraph (a) of this section applies to all equipment manufactured prior to January 10, 1992. After January 10, 1996, radiographic equipment other than storage containers and source changers must meet the requirements of Section 34.20, and Section 34.21 applies only to storage containers (source changers).

Section 34.22 Locking of radiographic exposure devices, storage containers, and source changers.

(a) Each radiographic exposure device shall 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 or its container shall be kept locked when not under the direct surveillance of a radiographer or a radiographer's assistant or as otherwise may be authorized in Section 34.41. In addition, during radiographic operations the sealed source assembly shall be secured in the shielded position each time the source is returned to that position.

and all storage containers for sealed sources or for radiographic exposure devices, must not have a radiation level in excess of 2 millisieverts (200 millirems) per hour at any exterior surface, and 0.1 millisieverts (10 millirems) per hour at 1 meter from any exterior surface. The radiation levels specified are with the sealed source in the shielded (i.e., "off") position.

(b) Paragraph (a) of this section applies to all equipment manufactured before January 10, 1992. After January 10, 1996, radiographic equipment other than storage containers and source changers must meet the requirements of § 34.20. Section 34.21 applies only to storage containers.

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

(a) Locked radiographic exposure devices and storage containers must be physically secured to prevent tampering.

(1) 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 or as otherwise may be authorized in § 34.51. In addition, during radiographic operations the sealed source assembly must be manually secured in the shielded position each time the source is returned to

(b) 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 when containing sealed sources except when under the direct surveillance of a radiographer or a radiographer's assistant.

that position, in those exposure devices manufactured before January 10, 1992.

(2) Each sealed source storage container and source changer must 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 must 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.

(b) Radiographic exposure devices, source changers, and storage containers, before being moved from one location to another, must have the guide tubes and control cables disconnected, safety plugs or covers applied, locked and physically secured to prevent accidental loss, tampering or removal of licensed material, and must be surveyed to assure that the sealed source is in the shielded position.

Section 34.23 Storage precautions.

Locked radiographic exposure devices and storage containers shall be physically secured to prevent tampering or removal by unauthorized personnel.

See § 34.35.

Section 34.24 Radiation survey instruments.

The licensee shall maintain sufficient calibrated and operable radiation survey instruments to make physical radiation surveys as required by this part and Part 20 of this chapter. Each radiation survey

Section 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

instrument shall be calibrated at intervals not to exceed three months and after each instrument servicing and a record shall be maintained of the results of each instrument calibration and date thereof for three years after the date of calibration. Instrumentation required by this section shall have a range such that two milliroentgens per hour through one roentgen per hour can be measured.

Section 34.25 Leak testing, repair, tagging, opening, modification and replacement of sealed sources.

(a) The replacement of any sealed source fastened to or contained in a radiographic exposure device and leak testing, repair, tagging, opening or any other

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. Survey instruments must be checked for operability before use each day. This may be accomplished by evaluating the instrument response to the previously measured fields at the projection sheath port or the control cable sheath port on a radiographic exposure device.

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

(3) So that an accuracy within plus or minus 20 percent of the calibration standard 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.

Section 34.27 Leak testing and replacement of sealed sources.

(a) The replacement of any sealed source fastened to or contained in a radiographic exposure device and leak testing of any

modification of any sealed source shall be performed only by persons specifically authorized by the Commission to do so.

(b) Each sealed source shall be tested for leakage at intervals not to exceed 6 months. In the absence of a certificate from a transferor that a test has been made within the 6 months prior to the transfer, the sealed source shall not be put into use until tested.

(c) The leak test must be capable of detecting the presence of 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, by a procedure to be approved pursuant to Section 34.11(f). Each record of leak test results must be kept in units of microcuries [or disintegrations per minute (dpm)] and retained for inspection by the Commission for three years after it is made.

(d) Any test conducted pursuant to paragraphs (b) and (c) of this section which reveals the presence of 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 of, in accordance with Commission regulations. A report shall be filed, within 5 days of the test, with the Director of Nuclear

sealed source must be performed only by persons specifically authorized by the Commission or an Agreement State to do so.

(b) Testing and recordkeeping requirements.

(1) Each licensee who uses a sealed source shall have the source tested for leakage at intervals not to exceed 6 months.

(2) The licensee shall maintain records of the leak tests in accordance with § 34.67.

(3) In the absence of a certificate from the transferor that a leak test has been made within the 6 months before the transfer, the sealed source may not be used until tested.

(c) Method of testing. The wipe of a sealed source must be performed using a leak test kit or method approved by the Commission or an Agreement State. The wipe sample must be taken from the nearest accessible point to the sealed source where contamination might accumulate. The wipe sample must be analyzed for radioactive contamination. The analysis must be capable of detecting the presence of 185 Bq (0.005 microcurie) of radioactive material on the test sample and must be performed by a person specifically authorized by the Commission or an Agreement State to perform the analysis.

(d) Any test conducted pursuant to paragraphs (b) and (c) of this section which reveals the presence of 185 Bq (0.005 microcurie) or more of removable radioactive material must be considered evidence that the sealed source is leaking. The licensee shall immediately withdraw the equipment involved from use and shall have it decontaminated and repaired or disposed of, in accordance with Commission regulations. A report must be filed with the Director of Nuclear

Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555 describing the equipment involved, the test results, and the corrective action taken. A copy of such report shall be sent to the Administrator of the appropriate Nuclear Regulatory Commission's Regional Office listed in Appendix D of Part 20 of this chapter "Standards for Protection Against Radiation."

(e) A sealed source which is not fastened to or contained in a radiographic exposure device shall have permanently attached to it a durable tag at least one (1) inch square bearing the prescribed radiation caution symbol in conventional colors, magenta or purple on a yellow background, and at least the instructions: "Danger -- Radioactive Material -- Do Not Handle -- Notify Civil Authorities if Found."

Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, within 5 days of any test with results that exceed the threshold in this subsection, describing the equipment involved, the test results, and the corrective action taken. A copy of the report must be sent to the Administrator of the appropriate Nuclear Regulatory Commission's Regional Office listed in Appendix D of Part 20 of this chapter "Standards for Protection Against Radiation."

(e) A sealed source which is not fastened to or contained in a radiographic exposure device must have permanently attached to it a durable tag at least one (1) inch square bearing the prescribed radiation caution symbol in conventional colors, magenta, purple or black on a yellow background, and at least the instructions: "Caution (or Danger) -- Radioactive Material -- Do Not Handle -- Notify Civil Authorities (or Name of Company)."

(f) Each exposure device using depleted uranium (DU) shielding and an "S" tube configuration must be periodically tested for DU contamination. This test can be performed by the licensee using available test kits or method approved by the Commission or an Agreement State, or the exposure device could be returned to the manufacturer for such testing. The analysis must be capable of detecting the presence of 185 Bq (0.005 microcuries) of radioactive material on the test sample and must be performed by a person specifically authorized by the Commission or an Agreement State to perform the analysis. This test must be undertaken at intervals not to exceed 12 months and should such testing reveal the presence of DU contamination, the exposure device must be removed from use and

arrangements for repair or proper disposal in a facility licensed under 10 CFR Part 61 must be made. A record of the DU leak-test must be made in accordance with § 34.67.

Section 34.26 Quarterly inventory.

Each licensee shall conduct a quarterly physical inventory to account for all sealed sources received and possessed under this license. The records of the inventories shall be maintained for three years from the date of the inventory for inspection by the Commission, and shall include the quantities and kinds of byproduct material, location of sealed sources, and the date of the inventory.

Section 34.27 Utilization logs.

Each licensee shall maintain current logs, which shall be kept available for three years from the date of the recorded event, for inspection by the Commission, at the address specified in the license, showing for each sealed source the following information:

(a) A description (or make and model number) of the radiographic exposure device or storage container in which the sealed source is located;

(b) The identity of the radiographer to whom assigned; and

(c) The plant or site where used and dates of use.

Section 34.28 Inspection and maintenance of radiographic exposure

Section 34.29 Quarterly inventory.

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

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

See § 34.71 .

Section 34.31 Inspection and maintenance of radiographic exposure devices, storage containers,

devices, storage containers, and source changers.

(a) The licensee shall check for obvious defects in radiographic exposure devices, storage containers, and source changers prior to use each day the equipment is used.

(b) The licensee shall conduct a program of inspection and maintenance of radiographic exposure devices, storage containers, and source changers at intervals not to exceed three months or prior to the first use thereafter to ensure proper functioning of components important to safety. The licensee shall retain records of these inspections and maintenance for three years.

Section 34.29 Permanent radiographic installations.

(a) Permanent radiographic installations having high radiation area entrance controls of the types described in Section 20.203(c)(2)(ii), (2)(iii), or (4) of this chapter shall also meet the following special requirement.

associated equipment, and source changers.

(a) The licensee shall visually check for obvious defects in radiographic exposure devices, storage containers, associated equipment, and source changers before use each day the equipment is used to ensure that the equipment is in good working condition and that required labeling is present. If defects are found, the equipment must be removed from service until repaired, and a record must be made in accordance with § 34.73.

(b) Each licensee shall have a program for inspection and routine maintenance of radiographic exposure devices, source changers, associated equipment and storage containers at intervals not to exceed 3 months or before the first use thereafter to ensure the proper functioning of components important to safety. Records of these inspections and maintenance performed must be made in accordance with § 34.73. If defects are found, the equipment must be removed from service until repaired, and a record must be made in accordance with § 34.73.

(c) The opening, repair, or modification of any sealed source must be performed by persons specifically authorized to do so by the Commission or an Agreement State.

Section 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 --

(1) Entrance controls of the type described in § 20.1601(a)(1) of this chapter; or

(b) 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 both 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.

(c) The alarm system must be tested at intervals not to exceed three months or prior to the first use thereafter of the source in the installation. The licensee shall retain records of these tests for three years.

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

(b) The alarm system must be tested for proper operation at the beginning of each day the installation is used for radiographic operations. The test must include a check of the visible and audible signals by turning on the exposure device before using the room. Entrance control devices must be tested monthly. If a control device or alarm is operating improperly, it must be immediately labeled as defective and repaired before industrial radiographic operations are resumed. Test records must be maintained in accordance with § 34.75.

REPORTING

Section 34.30 Reporting requirements.

See § 34.101.

(a) In addition to the reporting requirements specified under other sections of this chapter, each licensee shall provide a written report to the U.S. Nuclear Regulatory Commission; Division of Industrial and Medical Nuclear Safety; Medical, Academic and Commercial Use Safety Branch; Washington, DC 20555, with a copy to the Director, Office for Analysis and Evaluation of Operational Data, U.S. Nuclear Regulatory Commission, Washington, DC 20555,

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.

(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:

(1) A description of the equipment problem.

(2) Cause of each incident, if known.

(3) Manufacturer and model number of equipment involved in the incident.

(4) Place, time and date of the incident.

(5) Actions taken to establish normal operations.

(6) Corrective actions taken or planned to prevent recurrence.

(7) Qualifications of personnel involved in the incident.

(c) Reports of overexposure submitted under 10 CFR 20.405 which involve failure of safety components of radiography equipment must also include the information specified in paragraph (b) of this section.

See § 34.23.

Section 34.35 Labels, storage, and transportation precautions.

(a) Labels.

(1) The licensee may not use a source changer or container to store licensed material unless the source changer or the container has securely attached to it a durable, legible, and clearly visible label. The label must contain the radiation

symbol specified in § 20.1904 of this chapter and the wording

CAUTION (OR DANGER)

RADIOACTIVE MATERIAL--DO NOT HANDLE
NOTIFY CIVIL AUTHORITIES (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 CFR Part 71, including documentation of the Quality Assurance (QA) program requirements outlined in § 71.105.

(b) Security precautions during storage and transportation.

(1) Locked radiographic exposure devices and storage containers must be physically secured to prevent tampering or removal by unauthorized personnel in accordance with the requirements in § 34.23. The licensee shall store licensed material in a manner which will minimize danger from explosion or fire.

(2) 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

Section 34.41 Conducting 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(b). The

additional qualified individual(s) 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.

Section 34.42 Radiation Safety Officer.

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.

(a) The RSO's qualifications must include:

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

(2) 2000 hours of documented experience in industrial radiographic operations, with at least 40 hours of formal classroom training with respect to the establishment and maintenance of a radiation protection program.

(b) The specific duties of the RSO include, but are not limited to, the following:

(1) To establish and oversee operating, emergency, and ALARA procedures as required by Part 20, and to review them regularly to ensure that the procedures are current and conform with these rules;

(2) To oversee and approve all phases of the training program for radiographic personnel so that

appropriate and effective radiation protection practices are taught;

(3) To ensure that required radiation surveys and leak tests are performed and documented in accordance with these rules, including any corrective measures when levels of radiation exceed established limits;

(4) To ensure 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; and

(5) To ensure that operations are conducted safely and to assume control and have the authority to institute corrective actions including stopping of operations when necessary in emergency situations or unsafe conditions.

Section 34.31 Training.

(a) The licensee shall not permit any individual to act as a radiographer until such individual:

(1) Has been instructed in the subjects outlined in Appendix A of this part;

(2) Has received copies of and instruction in NRC regulations contained in this part and in the applicable sections of Parts 19 and 20 of this chapter, NRC license(s) under which the radiographer will perform radiography, and the

Section 34.43 Training.

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

(1) Has been instructed in the subjects outlined in paragraph (f) of this part.

(2) 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 Materials Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC. 20555.

(3) 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; in the applicable sections of Parts 19, 20, and 71 of

licensee's operating and emergency procedures;

(3) Has demonstrated competence to use the licensee's radiographic exposure devices, sealed sources, related handling tools, and survey instruments; and

(4) Has demonstrated understanding of the instructions in this paragraph (a) by successful completion of a written test and a field examination on the subjects covered.

(b) The licensee shall not permit any individual to act as a radiographer's assistant until such individual:

(1) Has received copies of and instruction in the licensee's operating and emergency procedures;

(2) Has demonstrated competence to use, under the personal supervision of the radiographer, the radiographic exposure devices, sealed sources, related handling tools, and radiation survey instruments that the assistant will use; and

(3) Has demonstrated understanding of the instructions in this paragraph (b) by successfully

this chapter, in applicable DOT regulations as referenced in 10 CFR Part 71, in the NRC license(s) under which the radiographer will perform radiography, and the licensee's operating and emergency procedures;

(4) Has demonstrated understanding of NRC regulations, the licensee's license, and the licensee's operating and emergency procedures by successful completion of a written examination.

(5) Has demonstrated competence in the use of the licensee's radiographic exposure devices, sealed sources, related handling tools, and survey instruments; and

(6) Has demonstrated understanding of the instructions in paragraph (a)(3) and (5) of this section by successful completion of a field examination.

(b) 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; in the applicable sections of Parts 19, 20, and 71 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 radiography, and the licensee's operating and emergency procedures;

(2) Has demonstrated competence to use, under the personal supervision of the radiographer, the radiographic exposure devices, sealed sources, related handling tools, and radiation survey instruments that the assistant will use; and

(3) Has demonstrated understanding of the instructions in

completing a written or oral test and a field examination on the subjects covered.

See § 34.11(d).

(c) Records of the above training, including copies of written tests and dates of oral tests and field examinations, shall be maintained for three years.

See Appendix A

this paragraph (b) of this section by successfully completing a written test and a field examination on the subjects covered.

(c) The licensee shall provide annual safety reviews for radiographers and radiographer's assistants at least once during each calendar year.

(d) The licensee shall conduct an annual 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 radiographic operation at intervals not to exceed 12 months; and

(2) Provide that, if a radiographer or a radiographer's assistant has not participated in a radiographic operation for more than 6 months since the last inspection, the individual's performance must be observed and recorded when the individual next participates in a radiographic operation.

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

(f) The licensee shall include the following subjects in the training required in paragraph (a)(1) 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
- (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 (pigtailed).
- (ii) Storage, control, and disposal of licensed material; and
- (iii) Maintenance of equipment.

(4) The requirements of pertinent Federal regulations; and

(5) Case histories of accidents in radiography.

(g) The licensee may, until (2 years after the final rule is published in the Federal Register), allow an individual who has not met the certification requirements of paragraph (a)(2) of this section to act as a radiographer after the individual has received training in the subjects outlined in paragraph (f) of this section and demonstrated understanding of those subjects by successful completion of a written examination that was previously submitted to and approved by the Commission.

Section 34.32 Operating and emergency procedures.

The licensee shall retain a copy of current operating and emergency procedures as a record until the Commission terminates the license that authorizes the activity for which the procedures were developed and, if superseded, retain the superseded material for three years after each change. These procedures must include instructions in at least the following:

- (a) The handling and use of licensed sealed sources and radiographic exposure devices to be employed such that no person is likely to be exposed to radiation doses in excess of the limits established in Part 20 of this chapter "Standards for Protection Against Radiation";
- (b) Methods and occasions for conducting radiation surveys;
- (c) Methods for controlling access to radiographic areas;
- (d) Methods and occasions for locking and securing radiographic exposure devices, storage containers and sealed sources;
- (e) Personnel monitoring and the use of personnel monitoring equipment;
- (f) Transporting sealed sources to field locations, including packing of radiographic exposure devices and storage containers in the vehicles, posting of vehicles and control of the sealed sources during transportation;
- (g) Minimizing exposure of persons in the event of an accident;
- (h) The procedure for notifying proper persons in the event of an accident; and

Section 34.45 Operating and emergency procedures.

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

- (1) The handling and use of licensed sealed sources and radiographic exposure devices to be employed such that no person is likely to be exposed to radiation doses in excess of the limits established in 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, 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);

See § 34.45(a)(11).

See § 34.45(a)(10).

(i) Maintenance of records.

See § 34.45(a)(13).

(j) The inspection and maintenance of radiographic exposure devices and storage containers.

(7) The inspection and maintenance of radiographic exposure devices and storage containers;

(k) Steps that must be taken immediately by radiography personnel in the event a pocket dosimeter is found to be off-scale.

(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;

(l) The procedure(s) for identifying and reporting defects and noncompliance, as required by Part 21 of this chapter.
See § 34.32(h).

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

See § 34.32(g).

(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; and

See § 34.32(i).

(13) Maintenance of records.

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

See § 34.44.

Section 34.46 Supervision of radiographers' assistants.

Whenever a radiographer's assistant uses radiographic exposure devices, uses sealed sources or related source handling tools, 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 personal presence at the site where the sealed sources are being used;

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

(c) The radiographer's watching the assistant's performance of the

Section 34.33 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 such individual wears a direct reading pocket dosimeter, an alarm ratemeter, and either a film badge or a thermoluminescent dosimeter (TLD) except that for permanent radiography facilities where other appropriate alarming or warning devices are in routine use, the wearing of an alarming ratemeter is not required. Pocket dosimeters must have a range from zero to at least 200 milliroentgens and must be recharged at the start of each shift. Each film badge and TLD must be assigned to and worn by only one individual.

(b) Pocket dosimeters must be read and exposures recorded daily. The licensee shall retain each record of these exposures for three years after the record is made.

(c) Pocket dosimeters shall be checked at periods not to exceed one year for correct response to radiation. Acceptable dosimeters shall read within plus or minus 30 percent of the true radiation exposure.

(d) If an individual's pocket dosimeter is discharged beyond its range, his film badge or TLD shall be immediately sent for processing.

operations referred to in this section.

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 a direct reading pocket dosimeter, an operating alarm ratemeter, and either a film badge or a thermoluminescent dosimeter (TLD). 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.

(2) Each film badge and TLD must be assigned to and worn by only one individual.

(3) Film badges and TLDs must be replaced at least monthly.

(4) After replacement, each film badge or TLD must be promptly processed.

(b) Pocket 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 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. Acceptable dosimeters must read within plus or minus 30 percent of the true radiation exposure.

(d) If an individual's pocket dosimeter is found to be off-scale and the possibility of radiation exposure cannot be ruled out as the cause, the individual's film badge

or TLD must be sent immediately for processing. In addition, the individual may not work with licensed material until a determination of the individual's radiation exposure has been made. This determination must be made 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 a film badge or TLD is lost or damaged, the worker shall cease work immediately until a replacement film badge or TLD is provided and the exposure is calculated for the time period from issuance to loss or damage of the film badge or TLD. The results of the calculated exposure and the time period for which the film badge or TLD was lost or damaged must be included in the records maintained in accordance with § 34.83.

(f) Reports received from the film badge or TLD processor must be retained in accordance with § 34.83.

(e) Reports received from the film badge or TLD processor must be retained for inspection until the Commission terminates each license that authorizes the activity that is subject to the recordkeeping requirement.

(f) Each alarm ratemeter must --

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

(2) Be set to give an alarm signal at a preset dose rate of 500 Mr/hr.;

(3) Require special means to change the preset alarm function; and

(g) Each alarm ratemeter must --

(1) Be checked to ensure that the alarm functions properly (sounds) before 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 dose rate.

(3) Be adequate to alert the individual regardless of the environmental conditions (e.g., high ambient noise levels).

(4) Require special means to change the preset alarm function; and

(4) Be calibrated at periods not to exceed one year for correct response to radiation: Acceptable ratemeters must alarm within plus or minus 20 percent of the true radiation dose rate.

(5) Be calibrated at periods not to exceed 12 months for correct response to radiation. The licensee shall maintain records of alarm ratemeter calibrations in accordance with § 34.83.

PRECAUTIONARY PROCEDURES IN RADIOGRAPHIC OPERATIONS

Section 34.41 Security.

See § 34.51.

During each radiographic operation the radiographer or radiographer's assistant shall maintain a direct surveillance of the operation to protect against unauthorized entry into a high radiation area, as defined in Part 20 of this chapter, except (a) where the high radiation area is equipped with a control device or an alarm system as described in Section 20.203(c)(2) of this chapter, or (b) where the high radiation area is locked to protect against unauthorized or accidental entry.

Section 34.42 Posting.

See § 34.53.

Notwithstanding any provisions in Section 20.204(c) of this chapter, areas in which radiography is being performed shall be conspicuously posted as required by Section 20.203(b) and (c)(1) of this chapter.

Section 34.43 Radiation surveys.

Section 34.49 Radiation surveys.

The licensee shall ensure that:
(a) At least one calibrated and operable radiation survey instrument is available at the location of its radiographic operations whenever radiographic operations are being performed, and at the storage area, as defined in Section 34.2, whenever a radiographic exposure device, a

The licensee shall:
(a) Conduct surveys with a calibrated and operable radiation survey instrument that meets the requirements of § 34.25.

storage container, or source is being placed in storage.

(b) A survey with a calibrated and operable radiation survey instrument is made after each exposure to determine that the sealed source has been returned to its shielded position. The entire circumference of the radiographic exposure device must be surveyed. If the radiographic exposure device has a source guide tube, the survey must include the guide tube.

(c) A survey with a calibrated and operable radiation survey instrument is made at any time a radiographic exposure device is placed in a storage area, as defined in Section 34.2, to determine that the sealed source is in its shielded position. The entire circumference of the radiographic exposure device must be surveyed.

(d) A record of the storage survey required in paragraph (c) of this section is made and is retained for three years when that storage survey is the last one performed in the work day.

See § 34.41.

(b) Conduct an adequate survey of the radiographic exposure device with a radiation survey instrument after each exposure to determine that the sealed source has been returned to its shielded position.

(c) Conduct a survey when approaching the guide tube before exchanging films, repositioning the collimator, or dismantling equipment.

(d) Conduct an adequate survey with a 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.

(e) Conduct a survey of the storage area to ensure that radiation levels do not exceed the limits specified in 10 CFR 20.1301. These surveys must be performed initially with radioactive material present in the storage location and thereafter at the time of the quarterly inventory and whenever storage conditions change (i.e., increases in radioactive material present or changes in shielding or arrangement of the radioactive material).

(f) Maintain records in accordance with § 34.85.

Section 34.51 Surveillance.

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 Part 20 of this chapter, except at permanent radiographic installations, where all entryways are locked and the requirements of § 34.33 are met.

See § 34.42.

Section 34.53 Posting.

Areas in which 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 radiographic operations.

Section 34.44 Supervision of radiographers' assistants.

See § 34.46.

Whenever a radiographer's assistant uses radiographic exposure devices, uses sealed sources or related source handling tools, or conducts radiation surveys required by Section 34.43(b) to determine that the sealed source has returned to the shielded position after an exposure, he shall be under the personal supervision of a radiographer. The personal supervision shall include: (a) The radiographer's personal presence at the site where the sealed sources are being used, (b) the ability of the radiographer to give immediate assistance if required, and (c) the radiographer's watching the assistant's performance of the operations referred to in this section.

EXEMPTIONS

Section 34.51 Applications for exemptions.

See § 34.111.

The Commission may, upon application by any licensee or upon its own initiative, grant such exemptions from the requirements of the regulations in this part as it determines are authorized by law and will not result in undue hazard to life or property.

Section 34.61 Violations

See § 34.121

(a) The Commission may obtain an injunction or other court order to prevent a violation of the provisions of-

(1) The Atomic Energy Act of 1954, as amended;

(2) Title II of the Energy Reorganization Act of 1974, as amended; or

(3) A regulation or order issued pursuant 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 Energy Act of 1954, as amended;

(ii) Section 206 of the Energy Reorganization Act;

(iii) Any rule, regulation, or order issued pursuant to the sections specified in paragraph (b)(1)(i) of this section.

(iv) Any term, condition, or limitation of any license issued under the sections specified in paragraph (b)(1)(i) of this section.

(2) For any violation for which a license may be revoked under Section 188 of the Atomic Energy Act of 1954, as amended.

Section 34.63 Criminal penalties.

See § 34.123

(a) Section 223 of the Atomic Energy Act of 1952, as amended, provides for criminal sanctions for

willful violation of, attempted violation of, or conspiracy to violate, any regulation issued under one or more of sections 161b, 161i, or 161o of the Act. For purposes of section 223, all the regulations in Part 34 are issued under one or more of sections 161b, 161i, or 161o, except for the sections listed in paragraph (b) of this section.

(b) The regulations in Part 34 that are not issued under sections 161b, 161i, or 161o for the purposes of section 223 are as follows:

§ 34.1, § 34.2, § 34.3, § 34.8,
§ 34.11, § 34.51, § 34.61, and
§ 34.63.

APPENDIX A

See § 34.43(f).

I. Fundamentals of Radiation Safety

A. Characteristics of gamma radiation.

B. Units of radiation dose (mrem) and quantity of radioactivity (curie).

C. Hazards of exposure to radiation.

D. Levels of radiation from licensed material.

E. Methods of controlling radiation dose:

1. Working time.
2. Working distances.
3. Shielding.

II. Radiation Detection Instrumentation To Be Used

A. Use of radiation survey instruments:

1. Operation.
2. Calibration.
3. Limitations.

B. Survey techniques.

C. Use of personnel monitoring equipment:

1. Film badges and
thermoluminescent dosimeters
(TLD's).

2. Pocket dosimeters.

3. Alarm ratemeters

III. Radiographic
Equipment To Be Used

A. Remote handling equipment.

B. Radiographic exposure
devices.

C. Storage containers.

IV. Inspection and Maintenance
Performed by the Radiographers

V. Case Histories of
Radiography Accidents

*** END OF DOCUMENT ***

Subpart E -- Records

Section 34.61 Records of specific
license for 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 or until the
Commission terminates the license.

Section 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 retain each record for 3
years after it is made.

(b) These records must include
the date, the individual making the
record, the radionuclide, number of
becquerels (curies), and make,
model, and serial number of each
sealed source and device, as
appropriate.

See § 34.24.

Section 34.65 Records of radiation survey instruments.

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

See § 34.25(c).

Section 34.67 Records of leak testing and replacement of sealed sources.

Each licensee shall maintain records of leak test results in units of becquerels (curies) and retain each record for 3 years after it is made.

See § 34.26.

Section 34.69 Records of quarterly inventory.

(a) Each licensee shall maintain records of the quarterly inventory and retain each record for 3 years after it is made.

(b) The record must include the quantities and kinds of byproduct material (including the model number, the serial number and manufacturer), location of sealed sources, the name of the individual conducting the inventory, and the date of the inventory.

See § 34.27.

Section 34.71 Utilization logs.

(a) Each licensee shall maintain current utilization logs at the address specified in the license, showing for each sealed source the following information:

(1) A description, including the make, model number, and serial number of the radiographic exposure device 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.

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

See § 34.28(b).

Section 34.73 Records of inspection and maintenance of radiographic exposure devices, storage containers, associated equipment, and source changers.

(a) Each licensee shall maintain records of defects found in daily checks and quarterly inspections and maintenance of radiographic exposure devices, storage containers, associated equipment, and source changers, and retain each record for 3 years after it is made.

(b) The record must include the date of check, name of inspector, equipment involved, any defects found, and repairs made.

See § 34.29(c).

Section 34.75 Records of alarm system checks at permanent radiographic installations.

Each licensee shall maintain records of alarm system and entrance control device tests and retain each record for 3 years after it is made.

See § 34.31(c).

Section 34.79 Records of training and certification.

Each licensee shall maintain the following records (of training and certification) for 3 years after the record is made:

(a) Records of training of each radiographer and each radiographer's assistant. The record must include radiographer certification documents, certification status verification, copies of written tests, dates of field examinations, and names of individuals conducting the field examinations, and

(b) Records of annual safety reviews and annual inspections for each radiographer and each

radiographer's assistant. The records must list the topics discussed during the annual safety review, the dates the annual safety review was conducted, and names of the instructors and attendees. For annual inspections, the records must also include a list showing the items checked and any regulatory non-compliances observed by the RSO.

See § 34.32.

Section 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.

Section 34.83 Records of personnel monitoring.

Each licensee shall maintain the following exposure records:

(a) Daily pocket dosimeter readings and yearly operability checks for 3 years after the record is made.

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

(c) Reports received from the film badge or TLD processor until the Commission terminates the license.

(d) Records of estimates of exposures as a result of off-scale pocket dosimeters or lost or damaged film badges or TLDs until the Commission terminates the license.

See § 34.33(b).

See § 34.33(e).

Section 34.85 Records of radiation surveys.

Each licensee shall maintain a record of each exposure device survey conducted before placing the device in storage in accordance with § 34.49(e) for 3 years after the record is made, if that survey is the last one performed in the work day.

See § 34.43(d).

See § 34.4.

Section 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.

Section 34.89 Documents and records required at field stations and permanent installations.

Each licensee shall maintain copies of the following documents and records sufficient to demonstrate compliance at the field station and permanent installation:

- (a) A copy of Parts 19, 20, and 34 of NRC regulations;
- (b) The license authorizing the use of licensed material;
- (c) Operating and emergency procedures required by § 34.45;
- (d) Records of radiation survey instrument calibrations required by § 34.65;
- (e) Records of leak test results required by § 34.67;
- (f) Quarterly inventory records required by § 34.69;
- (g) Utilization records required by § 34.71;
- (h) Records of inspection and maintenance required by § 34.73;
- (i) For permanent installations, records of alarm

system and entrance control checks required by § 34.75.

(j) Training and certification records required by § 34.79;

(k) Survey records required by § 34.85;

(l) Personnel monitoring records as required by § 34.83; and

(m) Records of receipt and transfer of sealed sources required by § 34.63.

Section 34.91 Documents and records required at temporary jobsites and use or storage locations exceeding 180 days.

Each licensee conducting operations at a temporary jobsite shall maintain copies of the following documents and records at the temporary jobsite until the radiographic operation is completed and at any storage location where radioactive material is stored for more than 180 days:

(a) Operating and emergency procedures required by § 34.45;

(b) Evidence of latest calibration of the radiation survey instruments in use at the site required by § 34.65;

(c) Evidence of latest calibrations of alarm ratemeters and operability checks of pocket dosimeters as required by § 34.83;

(d) Latest survey records required by § 34.85;

(e) The shipping papers for the transportation of radioactive materials required by § 71.5 of this chapter; and

(f) When operating under reciprocity pursuant to § 150.20 of this chapter, a copy of the Agreement State license authorizing use of licensed materials.

Subpart F -- Notifications

See § 34.30.

Section 34.101 Notifications

(a) In addition to the reporting requirements specified in § 30.50 and under other sections of this chapter, each licensee shall provide a written report to the U.S. Nuclear Regulatory Commission, Division of Industrial and Medical Nuclear Safety, Washington, DC 20555, with a copy to the Director, Office for Analysis and Evaluation of Operational Data, U.S. Nuclear Regulatory Commission, Washington, DC 20555, 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) The licensee shall notify the appropriate NRC regional office in writing 30 days before conducting radiographic operations or storing radioactive material at any location not listed on the license in excess of 180 days.

Subpart G -- Exemptions

See § 34.51.

Section 34.111 Applications for exemptions.

The Commission may, upon application of any interested person or upon its own initiative, grant such exemptions from the requirements of the regulations in this part as it determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest.

Subpart H - Violations

See § 34.61

§ 34.121 Violations.

(a) The Commission may obtain an injunction or other court order to prevent a violation of the provisions of

(1) The Atomic Energy Act of 1954, as amended;

(2) Title II of the Energy Reorganization Act of 1974, as amended; or

(3) A regulation or order issued pursuant 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;

(i) For violations of -

(i) Sections 53, 57, 62, 63, 81, 82, 101, 103, 104, 107, or 109 of the Atomic Energy Act of 1954, as amended;

(ii) Section 206 of the Energy Reorganization Act;

(iii) Any rule, regulation, or order issued pursuant to the

sections specified in paragraph (b)(1)(i) of this section.

(iv) Any term, condition, or limitation of any license issued under the sections specified in paragraph (b)(1)(i) of this section.

(2) For any violation for which a license may be revoked under section 188 of the Atomic Energy Act of 1954, as amended.

See § 34.63

§ 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 conspiracy to violate, any regulation issued under one or more of sections 161b, 161i, or 161o of the Act. For purposes of section 223, all the regulations in Part 34 are issued under one or more of sections 161b, 161i, or 161o, except for the sections listed in paragraph (b) of this section.

(b) The regulations in 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

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 or non-destructive testing;

2. Make its membership available to the general public nationwide that is not restricted because of race, color, religion, sex, age, national origin or handicap;

3. Have a certification program open to nonmembers;
4. Be an incorporated, nationally recognized organization, that is involved in setting national standards of practice within its fields of expertise;
5. Have a permanent full-time 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 assurance 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 certification program;
8. Have a committee, whose members can carry out their responsibilities impartially, to review complaints against certified individuals and to determine appropriate sanctions;
9. 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;
10. 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; and
11. Have procedures to 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 examines;

12. Exchange information about certified individuals with the Commission and the independent certifying organizations and allow periodic review of its certification program and related records;

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 that individuals (a) receive training in the topics set forth in § 34.34(f) of this part, 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 section 34.43(f) to this part; (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 whereby an application or certification would be considered null and void if the applicant or certified individual is prohibited from acting as a radiographer by a regulatory agency at the time of making the application;

5. Provide a certification period of not less than 3 years nor more than 5 years;

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

7. Include procedures whereby an individual's certification may be revoked, suspended, or restricted for willful or significant failure to comply with his or her employer's operating or emergency procedures, or the Commission's or an Agreement State's regulations;

8. Provide for automatic suspension of an individual's certification, based on Commission or Agreement State action prohibiting the individual from acting as a radiographer;

9. Provide for sanctions imposed against certified individuals that are at least as severe as any action taken by the Commission or an Agreement State; and

10. 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 section 34.43(f) or equivalent Agreement State requirements;

2. Written in a multiple-choice format;

3. Written at a ninth-grade reading comprehension level;

4. Scientifically-analyzed, before use, to ensure that the questions are not biased or

misleading, and that the examination of one certifying entity will produce a result equivalent to that of another certifying entity;

5. Tested by at least 50 individuals before being used in an actual examination leading to certification of individuals; and

6. Composed of questions randomly selected from a population of questions that contains ten times as many questions as may be needed for any one examination, to ensure that it is unlikely that an examinee would retake the same examination.

ENCLOSURE 2
FEDERAL REGISTER NOTICE

NUCLEAR REGULATORY COMMISSION

10 CFR Parts 34 and 150

RIN 3150-AE07

Licenses for Radiography

and

Radiation Safety Requirements for Radiographic Operations

AGENCY: Nuclear Regulatory Commission.

ACTION: Proposed rule.

SUMMARY: The Nuclear Regulatory Commission (NRC) is proposing to amend its regulations governing industrial radiography. The proposed rule would include additional safety requirements to enhance the level of protection of radiographers and the public and would clarify the regulations so that licensees may have a better understanding of what is expected in radiographic operations. The proposed rule includes a number of updated radiography regulations that have been adopted by the Agreement States. The major changes in the proposed rule include requirements for: (1) two qualified individuals to be present whenever radiography occurs at a temporary jobsite, (2) mandatory certification of radiographers, (3) permanent radiographic installations, and (4) a radiation safety officer. The format of the radiography regulations would be revised to place requirements into descriptive categories.

DATES: Submit comments by (90 days after publication). Comments received after this date will be considered if it is practical to do so, but the Commission is able to assure consideration only for comments received on or before this date.

ADDRESSES: Mail written comments to: Secretary, U.S. Nuclear Regulatory Commission, Washington DC 20555, Attention: Docketing and Service Branch. Hand deliver comments to 11555 Rockville Pike, Rockville, Maryland between 7:45 am and 4:15 pm on Federal workdays.

Examine comments received, the environmental impact, and the regulatory analysis at: The NRC Public Document Room at 2120 L Street NW. (Lower Level), Washington, DC.

FOR FURTHER INFORMATION CONTACT: Dr. Donald O. Nellis or Mary L. Thomas, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington DC 20555; Telephone: (301) 492-3628 or 492-3886.

SUPPLEMENTARY INFORMATION:

I. Background

Part 34 of Title 10 of the Code of Federal Regulations was first published in 1965 (30 FR 8192) as part of the recodification of Parts 30 and 31 for the purpose of simplifying and clarifying the format of the then-current requirements on radiography so that persons subject to byproduct material licensing regulations could conveniently use and understand them. Numerous modifications to the original Part 34 have been made since 1965, many

of which have been directed toward the safety aspects of field radiography. These modifications include performance requirements on radiography equipment and requirements for the use of alarming ratemeters published in 1990 (55 FR 843; January 10, 1993).

There are approximately 200 NRC radiography licensees with an additional 500 Agreement State licensees. Radiography licensees often conduct business under both NRC and Agreement State jurisdiction.

The NRC has not initiated an overall revision of Part 34 in many years. However, a number of Agreement States have updated their radiography regulations. The decision to develop an overall revision to 10 CFR Part 34 was made with the intent of establishing new safety requirements for radiography licensees and clarifying the regulation so that licensees will have a better understanding of what is expected in radiographic operations. The format of the radiography regulations would be revised to place requirements into descriptive categories that better describe the type of requirements found in the subpart.

The NRC solicited recommendations on radiography issues at the 1991 Agreement States' meeting in Sacramento, CA, as well as from NRC regional offices, radiography equipment manufacturers, and radiography licensees. Public comments were solicited on the issue of radiographer certification at the May 19, 1991, annual meeting of the Conference of Radiation Control Program Directors (CRCPD), Inc. in Wichita, Kansas, and a public workshop on radiographer certification was held May 27-28, 1992, in Mobile, Alabama. A separate workshop was held on November 18, 1992, in Dallas, Texas, to discuss recommendations received from the Agreement States and licensees on revision of the radiography regulations. The transcripts of these meetings, which are

available for inspection and copying in the NRC Public Document Room, were reviewed in further developing the proposed revision. The NRC utilized Part E of the "Suggested State Regulations for Control of Radiation" developed by the CRCPD, Part 31 of the Texas Regulations for Control of Radiation, Chapter 5 of the Louisiana regulations, and the Canadian "Atomic Energy Control Regulations," that apply to radiography in developing this proposed revision of Part 34.

II. Petition for Rulemaking

A petition was received on October 15, 1992, from the International Union of Operating Engineers (IUOE), Local No. 2, requesting an amendment to the radiography regulations to require a minimum of two radiographic personnel when performing industrial radiography at temporary jobsites. The petition was published in the Federal Register on December 4, 1992 (57 FR 57392). Thirty-eight comment letters were received, 35 were in favor of granting the petition. Resolution of this petition has been addressed in this proposed revision to Part 34.

The IUOE petition offered three options for the makeup of the two-person crew: (1) two radiographers; (2) one radiographer and one radiographer's assistant; and (3) one radiographer and one trainee, with the trainee having completed 40 hours of approved radiation safety training and passed an examination. The petitioners identified a number of problems associated with the use of licensed material by one radiographer at temporary jobsites. These problems included: (1) difficulty keeping the area under constant surveillance while radiographic operations are ongoing; (2) difficulty in

maintaining surveillance when working in trenches; and (3) difficulty in obtaining assistance in the event of an emergency if there is only one individual. The petitioners believe that the suggested change is necessary to ensure a safe working environment.

The comments received raised concerns regarding the combination of a radiographer and a trainee as a two-person team. Many stated that the trainee is an unskilled individual that may or may not achieve radiographer status and spending the time and money for 40 hours training may not be financially feasible for some radiography companies.

This proposed rule if adopted, would constitute a partial granting of the petition in that it proposes to require, at a minimum, a two-person crew whenever radiographic operations are being conducted outside of a permanent radiographic installation. The NRC has decided not to adopt the term "radiographer trainee," and is proposing that the second person be another qualified radiographer or an individual who has met, at a minimum, the requirements for a radiographer's assistant. The NRC recognizes that, in Agreement States, the training of those individuals designated as trainees would meet the NRC's training requirements for a radiographer's assistant.

The estimated cost of requiring the two-person crew could be significant for licensees which send only one radiographer to a temporary jobsite. However, the current regulation requires direct surveillance of the operation to prevent unauthorized entry into a high radiation area. To comply with this regulation most licensees already must use more than one qualified individual in many situations. For certain circumstances where a licensee could demonstrate that adequate surveillance can be maintained by one radiographer, the Commission could consider granting an exemption through the process

described in the proposed § 34.111. The Commission is concerned that this requirement could cause a significant impact on a number of small entities which currently do not use two-person crews, and is soliciting comments on the potential impact. Furthermore, the Commission is interested in receiving proposals for alternatives to the two-person requirement which would achieve comparable enhancements in safety with less of a burden on licensees.

In summary, the Commission believes that by requiring at least two qualified individuals to always be present when radiographic operations are being conducted, there will be a significant increase in assurance that operational safety measures and emergency procedures will be effectively implemented. The expectation is that violations involving failures to perform adequate radiation surveys of radiographic exposure devices and the surrounding area, failures to adequately post and monitor the restricted area, and failures to lock and secure the camera when not in use will become less frequent. Furthermore, if an incapacitating injury to a radiographer should occur at a remote location, the presence of a second individual could be an important factor in preventing unnecessary radiation exposures. The Commission is considering amending the Enforcement Policy as a result of this proposed rulemaking to provide, as an example of a Severity Level III violation, the conduct of radiography operations without the required second radiographer or individual with, at least, the qualifications of a radiographer's assistant as provided in the proposed § 34.41.

III. General Discussion of Proposed Rule Changes

The proposed amendments contain requirements which are intended to improve radiography safety. The first major change is a proposal to require, at a minimum, two qualified individuals (two radiographers or a radiographer and an individual who has met, at least, the requirements to be a radiographer's assistant) to be present any time radiographic operations occur outside of a permanent radiographic installation. This issue has already been addressed under Section II. Petition for Rulemaking.

On March 19, 1991 (56 FR 11504), the NRC published a final rule which provided for a voluntary third-party radiographer certification program through the ASNT, as discussed further in Section IV. Experience with such a voluntary program could provide the basis for a mandatory certification program. Several Agreement States have adopted mandatory radiographer state administered examination programs. The promulgation of these programs, as well as other changes in their radiography regulations, have contributed to an overall improvement in safety and a decrease in serious overexposures in these Agreement States.

The proposed rule would recognize other certifying organizations who meet the requirements outlined in Appendix A of the proposed rule. Independent certifying organizations would be required to meet all of the requirements listed in Appendix A, while Agreement States that wish to become certifying entities would only be required to meet the requirements listed in Part II and III of the Appendix. The NRC plans to publish annually in the Federal Register an updated list of certifying entities and to provide the

list with license application forms. The NRC also plans to investigate the feasibility of establishing a toll-free telephone number whereby licensees could obtain information on approved certifying entities.

Another issue involves the definition of a permanent radiographic installation. The proposed rule changes the definition of a "permanent radiographic installation" to mean an enclosed shielded room, cell, or vault in which radiography is performed. The terms "designed or intended for radiography" and "regularly performed" have been removed from the definition to reduce any ambiguity as to what is intended. Under the existing rule, if a licensee has a room, cell, or vault that meets the definition of a "permanent radiographic installation", then it must meet the special safety requirements of § 34.33. The proposed rule adds two additional requirements: (1) to perform a daily check of the visible and audible signals, and (2) to list all permanent facilities on the license. Under the proposed rule, radiography can only be performed in one of two ways: (1) in a permanent radiographic installation with a qualified radiographer, or (2) at any other location with at least two qualified individuals. The special safety requirements of § 34.33 would not apply to the use of a shielded room at a temporary jobsite, although licensees would be permitted to submit a license amendment requesting approval to use a shielded room which meets the requirements of § 34.33 as a permanent radiographic installation.

The proposed rule includes requirements specifying the qualifications and duties of the Radiation Safety Officer (RSO). The RSO is the key licensee individual charged with the responsibility to ensure that the requirements in the license are followed. These requirements have been based on similar commitments previously included in specific license conditions on a case-by-

case basis. The proposed rule would require additional special training for RSOs. The Commission is considering permitting existing RSOs to obtain the additional training within 2 years from the effective date of the rule and is specifically requesting comment on this proposed requirement.

IV. An Independent Certifying Entity (ASNT)

The current ASNT program for certifying industrial radiographers was approved by its Board of Directors in March 1990 and offers certification for either isotope or x-ray users. The NRC staff has extensively reviewed this program, which includes a written examination developed by the State of Texas.

The application to become a certified radiographer requires documentation of 40 hours of classroom training in radiation safety topics specified by ASNT including those topics listed in the proposed § 34.43(f), documentation of 520 hours of direct hands-on experience with radiography sources and devices under the control of an NRC or Agreement State licensee, and proof of successful completion of a practical examination on safety procedures administered by an ASNT-recognized institution. Recognized institutions, generally the candidates' employers, have been licensed by NRC or an Agreement State for the use of radiography sources.

After ASNT's approval of an application, a candidate radiographer takes the written examination. The examination is administered by ASNT or the Conference of Radiation Control Program Directors, Inc. (CRCPD) and subsequently sent to the State of Texas for grading. The results of the examination are forwarded to ASNT. The written examination covers the fundamental radiation safety principles outlined in 10 CFR Part 34, pertinent

Federal and State regulations, basic radiographic equipment operation, general operating and emergency procedures, radiation detection instrumentation, and radiation safety procedures applicable to industrial radiography. In addition, candidates are required to sign a pledge that they will abide by the ASNT Rules of Conduct. On successful completion of the required examinations and other requirements, a certified individual is provided with a wallet card identifying him/her as an ASNT-certified radiographer.

ASNT certification is valid for 3 years, unless suspended or revoked for cause. Renewal of certification may be accomplished either with or without reexamination. A candidate for renewal without reexamination must document continuous active full-time employment in radiography for at least 6 of the last 12 months. In addition, the candidate must document at least 8 hours, each year, of classroom refresher training covering basic radiation safety principles, equipment operations, emergency procedures, new safety regulations, license requirements, and other pertinent information. If these criteria are not met, the candidate must retake the written examination.

The ASNT Rules of Conduct require certified individuals to comply with NRC and Agreement State regulations and the employer's procedures for radiation safety, routine and emergency operations, and to act in a professional manner in matters pertaining to industrial radiography or to the ASNT certification.

The certification program also contains complaint and hearing procedures. For example, written allegations of unauthorized practice by an ASNT-certified individual are reviewed by the ASNT Ethics Subcommittee. In some cases a formal hearing may be held. If the ASNT Ethics Subcommittee

determines that an unauthorized practice has been committed, the subcommittee may take one of the following actions:

1. Revoke the individual's certification for a minimum of 1 year.
2. Suspend the individual's certification for 30 to 180 days.
3. Formally reprimand the individual.

More detailed information on the ASNT certification program is available from the American Society for Nondestructive Testing, Inc., 1711 Arlingate Plaza, P.O. Box 28518, Columbus, Ohio 43228-0518.

V. Discussion of the Proposed Rule

Table of Contents

The new Table of Contents contains eight subparts. The organization is as follows:

- Subpart A-General Provisions
- Subpart B-Specific Licensing Provisions
- Subpart C-Equipment
- Subpart D-Radiation Safety Requirements
- Subpart E-Recordkeeping Requirements
- Subpart F-Notifications
- Subpart G-Exemptions
- Subpart H-Violations
- Appendix A

This organization follows the same general format used in 10 CFR Part 39 concerning radiation safety requirements for well logging.

Subpart A-General Provisions

This subpart covers items of a general nature, such as listing definitions and OMB approvals. It also describes the purpose and scope of the rule.

Section 34.1, Purpose and scope, is basically unchanged from the existing regulation. Other NRC regulations that apply to radiography licenses are referenced in this section.

Section 34.3, Definitions, contains the following new terms: ALARA, Annual safety review, Becquerel, Certifying entity, Collimator, Field station, Gray, Independent certifying organization, Radiographer certification, Radiation Safety Officer, Sievert, S-tube, and Temporary jobsite. These definitions were added to define terms used in requirements not previously addressed in Part 34. The term ALARA, which means as low as reasonably achievable, has been added to describe a key element of the revised Part 20, "Standards for Protection Against Radiation," that licensees must implement by January 1994. The term Annual safety review was added to describe this activity in the proposed rule. The terms Becquerel, Gray, and Sievert were added to define the metric units used in all new or revised regulations. The terms Certifying entity, Independent certifying organization, and Radiographer certification were added to describe terms associated with revised requirements for verification of radiographer training. The term Collimator was added to the proposed rule to describe a piece of equipment that is often used in conducting radiography operations. The term S-tube was added to

describe this component of a radiographic exposure for which there are new requirements in the proposed rule. The terms Field station and Temporary jobsite were added to clarify the meaning of these terms in the proposed rule. The term Field station is being used to designate those locations where radiography equipment is stored and from which equipment is dispatched. The term Temporary jobsite is being used to describe locations not authorized on the license where radiography is conducted. The term Radiation Safety Officer (RSO) was added to describe the role of this individual in the proposed rule.

The terms Associated equipment, Control tube, Exposure head, Field examination, Projection sheath, Radiographic Operations, Shielded position, and Source assembly, while used in the existing regulation, were not previously defined. Both licensees and Agreement State representatives requested clarification of these terms. Changing the definition of radiographer's assistant was discussed at the November 1992 workshop in Dallas, Texas. Some Agreement States use the term "trainee" to refer to a radiographer's assistant and require training similar to that required of a radiographer. The NRC has decided to retain the term radiographer's assistant and has proposed upgrading the training requirements to provide additional assurance that radiographers' assistants are sufficiently knowledgeable of NRC regulations. Although the NRC is not adopting the term "trainee," the proposed rule has been written to provide the flexibility for the second person to have training beyond that of a radiographer's assistant. This position could then equally be filled by a "trainee."

The definition of a permanent radiographic installation was modified to remove ambiguities in the previous definition. The definitions of storage area and storage container were modified to remove references to

transportation. Specific transportation requirements are addressed in § 34.35.

Section 34.5, Interpretations, is standard regulatory language to state that only the General Counsel of the NRC has the authority to provide interpretations of the regulations which will be binding on the Commission.

Section 34.8, Information collection requirements: OMB approval, is unchanged from the current regulation, except for changing the section numbers to conform to the new format of the proposed rule and to list any new requirements that require OMB approval. The Commission has submitted the proposed rule for OMB clearance. Final OMB clearance will be obtained before publication of a final rule.

Subpart B-Specific Licensing Provisions

This proposed subpart provides the basic requirements for submittal of a license application. The sections in this proposed subpart are basically unchanged from those in the current Subpart A of Part 34.

Section 34.11, Application for a specific license, is worded the same as § 34.3 in the current Part 34.

Section 34.13, Specific license for radiography, has several changes from § 34.11 in the current Part 34. A proposed § 34.13(c) would specify requirements for establishing procedures to verify the certification status of radiographers. The requirement for verifying an individual's certification would only apply to previously certified radiographers whom a licensee might hire. A licensee would already know an individual's status if the individual is employed by the licensee at the time of certification. However, the licensee would be required to ensure that all radiographers are certified.

Section 34.13(e) proposes a reduction in the frequency of field inspections of radiographers and radiographer's assistants from quarterly to annually for individuals regularly conducting radiographic operations. For individuals who have not performed radiographic operations for more than six months, an inspection of job performance would be required at the time they next participate in a radiographic operation. This reduction is possible due primarily to the proposed two-person rule, adoption of mandatory certification for radiographers, and upgraded radiographer assistants training which would reduce the need for inspection of job performance. The basic requirements for conducting the field inspections have been relocated to § 34.43(d) to more accurately reflect its role in the training program. In addition, a requirement for conducting annual safety reviews has also been added in § 34.13(b)(1) and § 34.43(c) to clarify the intent of the current § 34.11(b) which requires periodic training. Section 34.13(g) is proposed to require the licensee to designate an individual on the license to fulfill the duties of the RSO. The qualifications and duties of this individual are specified in § 34.42.

Section 34.13(i) is a new paragraph which, as proposed, would require a list and description of all permanent radiographic installations and all field stations to be included in the license application.

Section 34.13(j) is a new paragraph which, as proposed, would permit licensees to have the option to use certified radiographers before the proposed rule is adopted in final form and becomes effective.

Subpart C-Equipment

This proposed subpart describes the requirements for radiographic equipment performance and use. Some of the requirements in this proposed subpart are changed from the current Part 34 as described below.

Section 34.20, Performance requirements for radiography equipment, is slightly changed from § 34.20 of the current rule. Section 34.20(b)(3) is revised to prohibit modification of any exposure device. The proposed rule was modified to remove any ambiguity regarding permission to modify safety components. The term Source assembly was added to § 34.20(c) and (e) to make clear that it is one of the pieces of equipment that must meet the requirements of § 34.20. Section 34.20(f) is added to require labeling of all associated equipment acquired after January 10, 1996, to identify that the components have met the requirements of this section.

Section 34.21, Limits on levels of radiation for radiographic exposure devices, storage containers, and source changers, is basically unchanged from § 34.21 of the current rule with the following exceptions. Metric equivalents to the values previously cited have been included. While it is recognized that radiation exposure instruments currently use units of roentgens to measure radioactivity, the rule has been modified to use the terms millisieverts and millirems. Rather than making the transition from roentgens to coulombs per kilogram (in air), the terms millisieverts and millirems were chosen because a quality factor of 1 is appropriate in dealing with gamma-ray emitting radiography sources. Under the proposed rule measurements taken in roentgens may continue to be recorded in terms of roentgens, provided the limits described in the rule, expressed in millisieverts or millirems, are not exceeded.

Section 34.23, Locking and relocation of radiographic exposure devices, storage containers, and source changers, is slightly changed from § 34.22 of the current rule, as described below. Section 34.23(a) describes locking of radiographic exposure devices. A requirement to remove the key of any keyed-lock is proposed. Should the key remain in the radiographic exposure device, there is an increased likelihood of the accidental or intentional removal of the sealed source when the radiographic device is unattended. The word "manually" is added to clarify what is meant by securing the source assembly for radiographic exposure devices manufactured before January 10, 1992. Section 34.23(b) is added which specifies requirements for ensuring that the sealed source is in the shielded position before moving the device and associated equipment because a number of overexposures have occurred while radiographic devices were being moved from one location to another.

Section 34.25, Radiation survey instruments, replaces § 34.24 in the current rule and has been updated to reflect current calibration standards for different types of survey meters. This is to specify requirements to address the variety of survey instruments currently available. An additional requirement to perform an operability check before use is proposed. While this is routinely part of all survey instrument specifications, a failure to determine whether an instrument was operable before use has been a contributing factor in overexposures during radiographic operations.

In § 34.27, Leak testing and replacement of sealed sources, the words "repair, tagging, opening, and modification" of sealed sources have been removed because these activities are only approved for individuals specifically licensed to do so. It was never intended that radiographers would be permitted to perform these activities without special authorization

from the Commission or an Agreement State. Section 34.31 was modified to include a specific prohibition on the opening, repair, or modification of sealed sources. Most of the language in the proposed rule is the same as § 34.25 of the existing rule. However, the organization has been modified for purposes of clarification. The requirement that performance of a source exchange or a leak test must be done by persons approved by the Commission has been modified to include Agreement States. Recordkeeping requirements have been moved to § 34.67.

Section 34.27(f) is proposed to require surveys for depleted uranium (DU) contamination in the "S" tube of radiographic devices at least once every 12 months. Depleted uranium is used as a shielding material in most radiographic devices and replaces the lead shielding that was used in older models. The presence of DU contamination in the "S" tube may be an indication that the control cable has worn a groove through the "S" tube into the DU shielding. This condition could cause binding of the control cable in the groove with the resultant inability to retract the source, and could result in unwarranted exposures. Recordkeeping requirements may be found in § 34.67.

Section 34.29, Quarterly inventory, is basically unchanged from the existing regulation with the exception of moving all recordkeeping requirements to § 34.69.

Section 34.31, Inspection and maintenance of radiographic exposure devices, storage containers, associated equipment, and source changers, includes several proposed changes from § 34.28 in the current rule. The term associated equipment has been included in the proposed rule, and includes various items used for specific tasks which may not be supplied with the radiographic device. Experience has shown that defects in associated

equipment can have an effect on safety. Therefore, associated equipment must be included in an inspection and maintenance program. Section 34.31(a) has been revised to clarify the intent of the daily visual check and the required actions if defects are found. In § 34.31(b), the term routine maintenance is now used to clarify that licensees are not required to perform all maintenance. Many equipment repairs may require returning the device to the manufacturer. Language has been added to specify that defective equipment must be removed from service until repaired and that a record of the defect, as well as corrective actions taken, must be made. While this appears obvious, there have been numerous instances where the use of defective equipment continued and overexposures of personnel occurred as a direct result of the defects. Recordkeeping requirements have been moved to § 34.73. The records required to be kept would now be specified in the rule, and include: date of check, individual performing check, equipment involved, any defects found, and repairs made.

Section 34.33, Permanent radiographic installations, is basically unchanged from the existing requirements in Part 34, with the exceptions noted below. Section 34.33(a) has been revised to clarify which entrance controls are required by incorporating the appropriate language from 10 CFR 20.1601 into Part 34. Section 34.33(b) is revised to require an alarm system check at the beginning of each day of use. This is to be performed by checking the warning light and audible alarm with the source exposed before using the room each day. A defective alarm would require repair before radiographic operations could resume. This requirement is included because there have been instances where failures in alarm systems have resulted in personnel overexposures upon entry into a high radiation area.

Section 34.35, Labels, storage, and transportation precautions, is a proposed new section that would place requirements that specify labeling and security precautions for radioactive material storage and transportation in Part 34 . Section 34.23 of the current rule describes storage precautions for exposure devices and storage containers but does not address transportation or labeling requirements. In § 34.35 of the proposed rule, labeling requirements for source changers and storage containers are specified. The proposed rule contains specific requirements to lock and physically secure transport packages. The proposed rule would also require licensees to store licensed material in a manner which minimizes the danger from explosions or fire. The requirement for a Quality Assurance (QA) program, as described in § 71.105, has been added to the proposed rule. While radiography licensees have always had to comply with § 71.105, there have been numerous cases where radiography licensees were unaware of this requirement and, therefore, failed to comply. The addition of requirements addressing labeling and transportation is necessary because in the past personnel and public exposures have occurred from the failure to properly safeguard radioactive material during storage and transportation.

Subpart D-Radiation Safety Requirements

This subpart describes basic radiation safety requirements for radiographic operations and includes training, safety procedures, personnel monitoring and surveys. New requirements describing the duties of the radiation safety officer are proposed.

Section 34.41, Conducting radiographic operations, would be added to address the practice of conducting radiography at sites where the special safety features of a shielded facility are not available. The proposed requirement specifies that, as a minimum, either two radiographers or a radiographer and an individual who has met the requirements to be a radiographer's assistant must be present any time radiographic operations occur outside a permanent installation. The basis for this proposed requirement is to ensure that, in the absence of the safety features outlined in § 34.33, there will be a significant increase in assurance that operational safety measures will be implemented effectively. The expectation is that violations involving failures to perform adequate radiation surveys of radiographic exposure devices and the surrounding area, failures to adequately post and monitor the restricted area, and failures to lock and secure the camera when not in use will become less frequent. Furthermore, if an incapacitating injury to a radiographer should occur at a remote location, the presence of a second individual could be an important factor in preventing unnecessary radiation exposures. Section 34.41(b) is proposed to require that radiographic operations conducted at locations listed on the license be conducted in a permanent radiographic installation. If licensees would need to perform radiography outside of a permanent facility due to some unique circumstances Commission authorization would be required, and the requirements of § 34.41(a) would need to be met.

Section 34.42, Radiation Safety Officer (RSO), lists the qualifications and duties of the RSO. This section would be added to place in the regulations the requirements for this key individual. Previously, these requirements were referenced in regulatory guides and included as license

conditions on a case-by-case basis, but not specified in the regulations. The NRC believes that the RSO is the key individual for ensuring safe operations.

The qualifications listed for the RSO in the proposed rule include:

(1) completion of the training required for a radiographer as described in Part 34; and (2) 2000 hours of documented experience in industrial radiography with at least 40 hours of formal classroom training with respect to the establishment and maintenance of radiation protection programs. It is anticipated that most existing RSOs already meet these requirements. It is proposed that licensees would have two years from the effective date of the rule to meet this 40 hour training requirement for existing RSOs. A key duty of the RSO is to ensure the safe conduct of operations and to stop unsafe operations and institute corrective actions. Other duties of the RSO in the proposed rule include overseeing procedure implementation and employee training, and monitoring radiation surveys, leak tests, and personnel monitoring results.

Section 34.43, Training, contains several new requirements. Section 34.43(a) has been revised to require radiographers to be certified by a certifying entity meeting the criteria specified in Appendix A of the proposed rule. To be recognized as a certifying entity, an independent organization meeting the criteria specified in Part I of Appendix A would have to apply as specified in § 34.43(a)(2). Certifying programs would be periodically reviewed by the NRC to ensure that the conditions of approval are being met. A list of approved certifying entities would be made available to licensees on request by contacting the appropriate regional office listed in Appendix D to 10 CFR Part 20, and would be published annually in the Federal Register. Under the proposed rule licensees would have 2 years to implement the proposed

change. The change in the verification of training requirements was included in the proposed rule to provide assurance of the quality of radiographers' training in the safe handling of radioactive material. NRC and Agreement States must reciprocally recognize valid radiographer certifications issued by either an independent certifying entity approved by the NRC or an Agreement State certification program meeting the requirements of Appendix A, Parts II and III, of the proposed rule. Also included in this section is training in §§ 30.7, 30.9, and 30.10, applicable sections of 10 CFR Part 71, and some instructions in applicable Department of Transportation (DOT) regulations as referenced in 10 CFR Part 71 in addition to other parts of NRC regulations.

Section 34.43(b), which lists training requirements for radiographers' assistants, has been revised to require training in §§ 30.7, 30.9, 30.10, and Parts 19, 20, 34, 71, and instructions in applicable DOT regulations as referenced in 10 CFR Part 71, in addition to the licensee's operating and emergency procedures. These changes are to ensure that radiographers and radiographers' assistants are knowledgeable of the safety requirements applicable to handling radioactive material in the conduct of radiography. In § 34.43(b)(3) the option of providing an oral test has been omitted. The proposed rule would only allow a written test to be given. Section 34.43(c) describes a proposed requirement to conduct annual safety reviews of radiographers and radiographers' assistants. In the current rule, periodic training is required but required topics to be addressed are not included. Because a number of violations involving personnel overexposures have resulted from licensees' failures to provide adequate training, the proposed amendment for annual safety reviews includes training on revised operating and emergency procedures, new equipment, and safety issues.

Section 34.43(d) has been relocated from § 34.11(d), and describes the requirements for routine inspections of job performance for radiographers and radiographers' assistants. The proposed rule reduces the frequency of these inspections from quarterly to annually. The NRC is proposing to reduce the frequency of inspections of job performance for individuals regularly conducting radiographic operations. For individuals who have not performed radiographic operations for more than six months, an inspection of their job performance would be required at the time of their next participation in a radiographic operation. With several of the other requirements proposed in this rulemaking, such as, certification of radiographers, and having at least two individuals at a temporary jobsite, the Commission believes that the frequency of inspection of job performance can be reduced from quarterly to annually.

Proposed § 34.43(e) specifies that recordkeeping requirements can be found in § 34.79. The requirements for records are unchanged from the current Part 34 except for the addition of records verifying the certification status of radiographers. Proposed § 34.43(f) contains the subjects currently listed in Appendix A of Part 34. Several additional requirements are proposed. These include: pictures or models of source assemblies; training in storage, control, and disposal of licensed materials; and pertinent Federal regulations, i.e., Department of Transportation. A new § 34.43(g) would be added which would allow licensees to continue to permit uncertified individuals to act as radiographers for a 2-year period after the proposed rule becomes final.

In § 34.45, Operating and emergency procedures, minor changes were made to include procedures for source recovery if the licensee intends to perform

emergency source recovery. These were added because many of the steps in a source recovery would be the same in any circumstance and, in the past, a number of personnel overexposures have occurred during emergency source recovery operations because basic radiation protection precautions were overlooked. Additional requirements are proposed for transportation procedures to include placarding of vehicles, and reference to the DOT regulations. A number of violations have resulted from licensees failing to follow DOT regulations in the transportation of radioactive material. Section 34.45(b) is proposed which specifies that the recordkeeping requirements can be found in § 34.81. Sections 34.89 and 34.91 specify that copies of current operating and emergency procedures are to be maintained at field stations, permanent installations, and temporary jobsites, to ensure that adequate documents are available where radiographic operations occur.

Section 34.46, Supervision of radiographers' assistants, is unchanged from § 34.44 of the current rule.

In § 34.47, Personnel monitoring, several changes are proposed. The existing requirement specifies that pocket dosimeters have a range from zero to at least 200 milliroentgens. The proposed rule has dropped the term "at least," to limit the range to be only from 0-200. This is to prevent the use of pocket dosimeters with very high ranges where the users would be unable to properly determine their exposure. Use of pocket dosimeters with a range higher than 200 milliroentgens will be considered on a case-by-case basis. Additional requirements are proposed on the replacement frequency for film and TLDs. The existing regulation does not specify the replacement frequency for film and TLDs. The high intensity sources used in radiography necessitate frequent monitoring. Monthly replacement is judged to be an appropriate

frequency to adequately track an individual's exposure. With the new lower limits for occupational dose, less frequent monitoring could result in a worker receiving an overexposure.

Section 34.47(b) addresses the use of pocket dosimeters. A requirement to read dosimeters at the beginning and end of each shift is proposed. This is added to ensure that the dose is correctly estimated. The existing regulation only specifies a daily reading and does not provide sufficient instruction on how licensees should handle any readings which remain on the pocket dosimeter after recharging. Because it is nearly impossible to recharge a pocket dosimeter to zero, licensees must take a reading before and after use and determine the difference to determine the dose accurately. Section 34.47(d) addresses an off-scale pocket dosimeter. The proposed rule would require that, in the case of a pocket dosimeter being off-scale, the individual will not be permitted to work with licensed material until the RSO or a designee of the RSO makes a determination of the worker's radiation exposure. The current rule requires that the worker's film badge or TLD be sent for processing, but does not specify when the individual can return to work. The proposed revision provides the criteria that must be met before permitting the individual to return to work. A provision is included which will permit the individual to return to work when the circumstances are clearly known and justified by the RSO that there was no possibility of overexposure.

Section 34.47(e) is proposed to require that a worker cease work whenever a film badge or TLD is lost or damaged until a replacement is available. This is added to ensure that there is a means to accurately determine the worker's radiation dose.

Section 34.47 (g) has a proposed revision to require alarm ratemeters to be capable of alerting the wearer regardless of the environmental conditions. In a recent radiography overexposure incident, a licensee reported that a radiographer who was wearing ear protection due to high workplace noise levels was overexposed because he was unaware that his ratemeter was alarming. For use in high ambient noise areas, ratemeters could be supplied with either a vibrating alarm that could be felt by the wearer or a small speaker built into hearing protectors to meet this requirement. NRC expects its licensees to determine the need for alarm ratemeters that incorporate these additional protective measures.

In § 34.49, Radiation surveys, there are several proposed changes. The existing regulation requires a survey of the circumference of the radiographic exposure device and the guide tube. A number of violations of NRC requirements have occurred due to a failure to comply with the requirement to survey the full circumference of the camera. In reviewing the regulation, the NRC has decided to revise the survey requirements to specify that a survey be conducted of the radiographic exposure device to determine that the sealed source has returned to the shielded position, and specify that for the radiographer to conduct a survey as he/she approaches the guide tube to exchange film, reposition the collimator, or dismantle equipment. The proposed rule places the responsibility with the licensee for ensuring that an adequate survey is conducted. In the majority of cases, a survey of the radiographic exposure device's ports should be adequate to make this determination. A proposed requirement to survey storage areas when radioactive material is initially placed in storage, during each quarterly

inventory, and whenever changes occur which could increase radiation levels, is added.

Section 34.51, Surveillance, is basically unchanged from § 34.41 of the current rule. References to Part 20 have been updated to reflect the proposed revisions in § 34.33.

Section 34.53, Posting, is basically unchanged from § 34.42 of the current rule except to incorporate current references to Part 20.

Subpart E-Recordkeeping Requirements

This subpart does not appear in the current Part 34. This subpart is proposed to place all recordkeeping and notification requirements in one location. Most of the recordkeeping requirements are unchanged from those contained in the existing Part 34. Proposed changes are discussed below.

Section 34.61, Specific license for radiography, requires the licensee to maintain a copy of the license until it is terminated by the Commission.

Section 34.63, Records of receipt and transfer of sealed sources, is added to provide a record showing the disposition of sources.

Section 34.65, Records of radiation survey instruments, is proposed as currently written in Section 34.24. Licensees would be required to maintain calibration records for radiation survey instruments for 3 years after the record is made.

Section 34.67, Records of leak testing and replacement of sealed sources is proposed as currently written in § 34.25(c) and requires licensees to maintain records of leak tests for 3 years after the record is made.

Section 34.69, Records of quarterly inventory is proposed as currently written § 34.26 and requires licensees to maintain records of quarterly inventories for 3 years after the record is made.

Section 34.71, Utilization logs, is proposed much as currently written in § 34.27. This section would require licensees to maintain utilization logs for 3 years after the record is made. The proposed rule has added several additional pieces of information to the logs including the serial number of the device in which the sealed source is located, the radiographer's signature, and the dates the device is removed and returned to storage. This information is necessary in order to verify location of sources.

Section 34.73, Records of inspection and maintenance of radiographic exposure devices, storage containers, associated equipment, and source changers, is proposed much as currently written in § 34.28(b). This section requires licensees to maintain inspection and maintenance records for 3 years after the record is made. The proposed rule would specify the information that must be included in the inspection records: date of check, name of inspector, equipment inspected, any defects found, and repairs made.

Section 34.75, Records of alarm system checks at permanent radiographic installations, is proposed as currently written in § 34.29(c) and requires licensees to maintain records of alarm system checks for 3 years after the record is made.

Section 34.79, Records of training, is proposed as currently written in § 34.31(c) with proposed additional requirements for maintaining records of radiographer certification and annual safety reviews. This paragraph would require licensees to maintain records verifying radiographer certification status. For annual safety reviews, the records would include copies of tests,

dates administered, names of instructors and attendees, and the topics covered. Under the proposed rule, records of the annual inspections would include a list of items checked, and any non-compliances observed by the RSO.

Section 34.81, Copies of operating and emergency procedures, is proposed as currently written in § 34.32 and requires licensees to maintain copies of emergency and operating procedures until the Commission terminates the license.

Section 34.83, Records of personnel monitoring, is proposed as currently written in § 34.33(b), and requires licensees to maintain records of alarm ratemeter calibrations, pocket dosimeter readings, and operability checks for 3 years from the date the record was made, and to maintain records of film badge or TLD reports until the Commission terminates the license.

Section 34.85, Records of radiation surveys, is proposed as currently written in § 34.43(d) and requires records of the exposure device surveys for 3 years from the date the record was made.

Section 34.87, Form of records, is proposed as currently written in § 34.4 and specifies how records must be maintained, including permitting records to be stored in electronic media.

Section 34.89, Documents and records required at field stations and permanent installations, would be added to list documents and records required at field stations and permanent installations. This section is necessary to ensure that licensees have available sufficient records to demonstrate compliance with NRC regulations. Field stations and permanent installations may be far removed from the home office. Therefore, records necessary to conduct operations safely should be readily available. These records include a copy of the current license, copies of pertinent regulations, copies of

operating and emergency procedures, instrument calibration records, leak test results, inventory records, utilization logs, training and survey records. These records are those required for licensees to safely handle radioactive material, and are a subset of the records required at a licensee's normal place of business.

Section 34.91, Documents and records required at temporary jobsites and use or storage locations exceeding 180 days, would be added to list documents and records required at temporary jobsites and locations where radioactive material will be in use or storage for more than 180 days. This section is necessary to ensure that licensees have available sufficient records to demonstrate compliance with NRC regulations and those records necessary to maintain safe operations. The records listed are a smaller subset of the records required for a field station or permanent installation. These records include copies of pertinent regulations, evidence of latest instrument calibrations, latest survey records, shipping papers, and Agreement State license if operating under reciprocity. These records are those required for licensees to safely handle radioactive material.

Subpart F - Notifications

This subpart is basically unchanged from § 34.30 with the exception of an additional requirement. Section 34.101(c) would require licensees to notify the appropriate NRC regional office in writing before using or storing radioactive material in one location for more than 180 days. This notification would be required within 30 days of exceeding the 180-day timeframe. This provision would be added to provide the NRC with information

in a timely manner to permit inspection of radioactive material at these locations.

Subpart G - Exemptions

This subpart addresses exemptions and is basically the same as § 34.51 in the current Part 34 with the exception of minor wording changes to make it consistent with current language used in other parts of the rule. See § 39.91.

Subpart H - Violations

This subpart addresses violations and is basically the same as § 34.61 and § 34.63 in the current Part 34 with the exception of minor wording changes to make the sections referenced consistent with the proposed rule.

Appendix A to Part 34

This appendix is new. The requirements in Appendix A to the current Part 34 have been relocated to § 34.43(f). Part I of the new Appendix A provides the proposed requirements for an independent certifying organization, and does not apply to Agreement States choosing to become a certifying entity. Parts II and III of the new Appendix A provide the proposed requirements for certification programs and written examinations for a certifying entity, which would include Agreement States. The proposed Appendix A would not impose new requirements on NRC's radiography licensees.

NRC is proposing that an independent certifying organization would have to be a national society or association involved in setting national standards of practice for industrial radiography or non-destructive testing to be

recognized. Membership in the organization could not be restricted because of race, color, religion, sex, age, national origin or handicap and the organization's certification program would need to be open to nonmembers. The independent certifying organization would need to

- (1) Be incorporated;
- (2) Have a permanent full-time staff;
- (3) Be nationally recognized;
- (4) Have a policy and decision-making review board;
- (5) Be governed by written organizational by-laws and policies; and
- (6) Have a viable system of financing its operations.

An independent certifying organization would also need to have

- (1) A committee to review and approve certification guidelines and procedures and to advise the organization's staff in implementing its certification program;
- (2) A committee to review complaints against certified individuals;
- (3) Written procedures describing its certification program; and
- (4) An agreement to exchange information about certified individuals with the Commission and the Agreement States.

For a certification program to be acceptable, NRC is proposing that it include provisions requiring individuals to receive training in the topics listed in § 34.43(f), complete a written examination, complete a practical examination or equivalent, and require a minimum period of on-the-job experience. The program would also have to include procedures that ensure due process whenever an individual's certification may need to be revoked, suspended, or restricted for willful or significant failure to comply with his

or her employer's operating or emergency procedures, or the Commission's or an Agreement State's regulations.

For the written examination, NRC is proposing that it be: (1) designed to test knowledge and understanding of the subjects listed in § 34.43(f); (2) written for a ninth-grade reading comprehension level; and (3) scientifically analyzed to ensure that the questions are not biased or misleading.

Agreement State Compatibility

The rule will be a matter of compatibility between the NRC and the Agreement States, thereby providing consistency between Federal and State safety requirements. With regard to basic radiation equipment specifications, standards and definitions, identified as matters of Division 1 level of compatibility, the Agreement States will be expected to adopt, essentially verbatim, the proposed Part 34 standards and definitions into their equivalent regulations. However, the NRC also recognizes that certain terms, such as radiographer assistant, may not be used in present Agreement State regulations. Continued use of alternative terms, such as "trainee" will be considered acceptable so long as the underlying requirements of the position are consistent with those proposed by the Commission.

3 For Agreement States that wish to develop radiographer certification programs, ^{would be expected to adopt} ~~Parts II and III of the proposed Appendix A would also be~~ Division 1 ~~items of compatibility.~~ The definitions and the requirements for certification programs and written examinations contained in this rulemaking must be the same for all NRC and Agreement State licensees to maintain

consistency. In practice, States that develop certification programs must develop regulatory language and regulations that implement Appendix A, Parts II and III criteria. States would be permitted to include additional administrative requirements (such as State-issued cards). States that do not develop certification programs would not be expected to implement Appendix A. NRC or an Agreement State must reciprocally recognize valid radiographer certifications issued by either an independent certifying entity approved by the NRC or by an Agreement State certification program meeting the requirements of Appendix A, Parts II and III, of the proposed rule.

2 ~~Part I~~ of Appendix A of proposed 10 CFR Part 34, provides the requirements for independent certifying organizations to be acceptable to NRC. The Commission reserves the right to make this determination and therefore this is a Division 4 item of compatibility. Because it concerns a regulatory function that will be reserved for the Commission pursuant to 10 CFR Part 150, the Agreement States will not need to adopt this provision of the proposed rulemaking. A new section proposed for Part 150 would make clear the Commission's intent to reserve this function and also to reserve the right to set minimum radiographer certification standards.

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FF } The remainder of the rule will be a Division 2 level of compatibility allowing the Agreement State regulators the flexibility to adopt similar or more stringent requirements based on their radiation protection experience, professional judgments, and community values.

Implementation

The Commission intends to have different implementation dates for particular requirements of this proposed rule. The proposed requirements would become effective 90 days after publication of the final rule in the Federal Register. For the proposed requirements in § 34.41 to use, as a minimum, a two-person crew for radiographic operations not conducted in a permanent facility, licensees would have 1 year from the effective date of the rule to comply. Licensees would be required to affirm that all radiographers have met the certification requirements of 34.43(a)(1) within 2 years from the effective date of the rule. This would allow radiography licensees operating in NRC jurisdiction 2 years to obtain certification for their employees who act as radiographers. This requirement would include radiographers employed by Agreement State licensees operating in non-Agreement States under reciprocity pursuant to 10 CFR 150.20. The Commission notes that the State of Texas currently provides a 90-day grace period for non-Texas licensees operating in that State under reciprocity (TRC 31.90). However, because this proposed rule will be a matter of compatibility, the requirement for mandatory certification would apply to radiography licensees nationwide.

Licensees would have one year from the effective date of the rule to comply with the additional training requirements specified in § 34.43(b). Licensees could consider combining this training with the annual safety review.

For the proposed revision to § 34.47(g) that would require alarm ratemeters be capable of alerting the wearer regardless of environmental

conditions, licensees would have 1 year to obtain or modify a sufficient number of additional alarm ratemeters to meet anticipated needs.

For use/storage locations not previously identified on the license (e.g., field stations, permanent radiographic installations, and temporary jobsites exceeding 180 days) licensees must request amendments or notify the NRC, as appropriate, by the effective date of the rule. Few amendment requests are anticipated.

All current RSOs would be granted a two-year extension to meet the proposed additional RSO training requirements specified in § 34.42(a).

The Commission requests that persons commenting on this proposed rulemaking particularly address any hardships that would result if the proposed rule were adopted and also address any hardships that would result if the proposed implementation schedule were adopted. The NRC is particularly interested in suggestions for alternative implementation schedules.

Finding of No Significant Environmental Impact: Availability

The Commission has determined under the National Environmental Policy Act of 1969, as amended, and the Commission's regulations in Subpart A of 10 CFR Part 51, that the rule, if adopted, would not be a major Federal action; therefore, an impact statement is not required. The revision of 10 CFR Part 34 should have no environmentally significant impact because radiography only involves the use of sealed sources, and no environmental impact will be involved. The environmental assessment and finding of no significant impact on which this determination is based are available for

inspection at the NRC Public Document Room at 2120 L Street, NW. (Lower Level), Washington DC.

Paperwork Reduction Act Statement

This proposed rule amends information collection requirements that are subject to the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). This rule has been submitted to the Office of Management and Budget for review and approval of the information collection requirements.

The public reporting burden for this collection of information is estimated to average 13 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Information and Records Management Branch (MNBB-7714), U.S. Nuclear Regulatory Commission, Washington, DC 20555; and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-3019, (3150-0007), Office of Management and Budget, Washington, DC 20503.

Regulatory Analysis

The Commission has prepared a draft regulatory analysis on this proposed regulation. The analysis examines the costs and benefits of the alternatives considered by the Commission. The draft analysis is available for inspection

in the NRC Public Document Room at 2120 L Street NW. (Lower Level),
Washington, DC.

Regulatory Flexibility Analysis

The NRC has prepared an initial regulatory analysis of the impact of this proposed rule on small entities. A summary of this analysis appears as Appendix A to this document. A copy of the analysis is available for inspection in the NRC Public Document Room, 2120 L Street, NW. (Lower Level), Washington, DC. Single copies of the analysis may be obtained from Donald O. Nellis or Mary L. Thomas, Division of Regulatory Application, Office of Research, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Telephone (301)-492-3785. The NRC is seeking public comment on the initial regulatory flexibility analysis. The NRC is particularly seeking comment from small entities (i.e., small businesses, small organizations, and small jurisdictions under the Regulatory Flexibility Act) as to how the regulations will affect them and how the regulations may be tiered or otherwise modified to impose less stringent requirements on small entities while still adequately protecting the public health and safety. Those small entities which offer comments on how the regulations could be modified to take into account the differing needs of small entities should specifically discuss the following items:

(a) The size of their business and how the proposed regulations would result in a significant economic burden upon them as compared to larger organizations in the same business community.

(b) How the proposed regulations could be modified to take into account their differing needs or capabilities.

(c) The benefits that would accrue, or the detriments that would be avoided, if the proposed regulations were modified as suggested by the commenter.

(d) How the proposed regulations, as modified, would more closely equalize the impact of NRC regulations or create more equal access to the benefits of Federal programs as opposed to providing special advantages to any individuals or groups.

(e) How the proposed regulations, as modified, would still adequately protect the public health and safety.

The comments should be sent to the Secretary of the Commission, U.S. Nuclear Regulatory Commission, Washington, DC 20555, Attn: Docketing and Service Branch.

Backfit Analysis

The NRC has determined that the backfit rule, 10 CFR 50.109, does not apply to this proposed rule and, therefore, that a backfit analysis is not required for this proposed rule. The proposed rule does not involve any provisions that would impose backfits as defined in 10 CFR 50.109(a)(1).

List of Subjects

10 CFR Part 34

Byproduct material, Criminal penalties, Nuclear material, Packaging and containers, Radiation protection, Radiography, Reporting and recordkeeping requirements, Scientific equipment, Security measures.

10 CFR Part 150

Criminal penalties, Hazardous materials - transportation, Intergovernmental relations, Nuclear materials, Reporting and recordkeeping requirements, Security measures, Source material, Special nuclear material.

For reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended, the Energy Reorganization Act of 1974, as amended, and 5 U.S.C. 553, the NRC is proposing to adopt the following amendments to 10 CFR 34.

PART 34--LICENSES FOR RADIOGRAPHY AND RADIATION SAFETY
REQUIREMENTS FOR RADIOGRAPHIC OPERATIONS

1. The authority citation for Part 34 is revised to read as follows:

AUTHORITY: Secs. 81, 161, 182, 183, 68 Stat. 935, 948, 953, 954, as amended (42 U.S.C. 2111, 2201, 2232, 2233); sec. 201, 88 Stat. 1242, as amended (42 U.S.C. 5841).

Section 34.45 also issued under sec. 206, 88 Stat. 1246 (42 U.S.C. 5846).

2. The existing headings for Subparts A and B and each of the existing undesignated center headings are removed.

3. A new heading for subpart A (§§ 34.1 - 34.8) is added to read as follows:

Subpart A - General Provisions.

4. Section 34.1 is revised to read as follows:

§ 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 are in addition to, and not in substitution for, other requirements of this chapter. In particular, the requirements and provisions of Parts 19, 20, 21, 30, 71, 150, 170, and 171 of

this chapter apply to applications and licenses subject to this part. This rule does not apply to medical uses of byproduct material.

5. Section 34.3 is removed.

§ 34.3 [Removed]

6. Section 34.2 is redesignated as § 34.3, and the new § 34.3 is revised to read as follows:

§ 34.3 Definitions.

ALARA (acronym for as low as reasonably achievable) means making every reasonable effort to maintain exposures to radiation as far below the dose limits specified in Part 20 as is practical consistent with the purpose 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 improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to utilization of nuclear energy and licensed materials in the public interest.

Annual safety review means a review conducted or provided by the licensee for its employees on radiation safety aspects of radiography. The review may include, as appropriate, the results of internal inspections, new procedures or equipment, accidents or errors that have been observed, and opportunities for employees to ask safety questions.

Associated equipment means equipment 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} (~~crank-out device~~), removable source stop, "J" tube).

Becquerel (Bq) means one disintegration per second.

Certifying entity means an independent certifying organization meeting the requirements in Appendix A or an Agreement State meeting the requirements in Appendix A, Parts II and III.

Collimator means a device used to limit the size, shape, and direction of the primary radiation beam.

Control tube means a protective sheath for guiding the control cable.

The control tube ^{is used to drive the source to & from the exposure location} connects the control drive mechanism to the radiographic exposure device.

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.)

Field examination means a demonstration through practical application of the safety rules and principles in radiography including use of all appropriate equipment and procedures.

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

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.

Independent certifying organization means an independent organization that meets all of the criteria in Appendix A of this part.

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

Projection sheath (guide tube) means a flexible or rigid tube (i.e., "J" tube) for guiding the source assembly and the attached control cable from the radiographic exposure device to the exposure head or working position.

Radiation Safety Officer means an individual named by the licensee who has knowledge of, responsibility for, and authority to ensure compliance with appropriate radiation protection rules, standards, and practices on behalf of the licensee and who meets the requirements of § 34.42.

Radiographer means any individual who meets the requirements of 34.43, is in attendance at the site where the sealed source or sources are being used, personally supervises radiographic operations and who is responsible to the licensee for ensuring 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 training, testing, and experience criteria.

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

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

Radiography means the examination of the structure of materials by nondestructive methods, utilizing sealed sources of byproduct materials.

S-tube means a tube (typically made of a hard metal, such as, titanium) through which the radioactive source travels in 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. (In this position the radiation exposure will be at a minimum. This position incorporates maximum shielding for the radioactive source.)

Sievert means the SI unit of any of the quantities expressed as dose equivalent. The absorbed dose in grays multiplied by the quality factor is equal to the dose equivalent in Sieverts. For comparison $1 \text{ Sv} = 100 \text{ rems}$.

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 device in which sealed sources are stored.

Temporary jobsite means a place where radiographic operations are conducted other than the location(s) of use authorized on the license.

7. Section 34.4 is removed.

§34.4 [Removed]

8. Section 34.5 is added to read as follows:

§ 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.

9. Section 34.8 is revised to read as follows:

§ 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 of 1980 (44 U.S.C. 3501 et seq.). 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,

35.41, 34.43, 34.45, 34.47, 34.49, 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, 34.91, 34.101, 34.111, 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 requirement and the control number under which it is approved are as follows:

(1) In § 34.11, NRC Form 313 is approved under control number 3150-0120.

10. A new heading for Subpart B [§§ 34.11-34.13] is added to read as follows:

Subpart B - Specific Licensing Provisions

11. Section 34.11 is revised to read as follows:

§ 34.11 Application for a specific license.

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

12. Section 34.13 is added to read as follows:

§ 34.13 Specific license for radiography.

The Commission will approve an application for a specific license for the use of licensed material in radiography if the applicant meets the following requirements:

(a) The applicant shall satisfy 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 shall develop an adequate program for training radiographers and radiographers' assistants that meets the requirements of § 34.43, and submit to the Commission a description of this program which specifies the --

- (1) Initial training;
- (2) On-the-job training;
- (3) Annual safety reviews; and

(4) Means the applicant will use to demonstrate the radiographer's and radiographer's assistant's knowledge and understanding of and ability to comply with the Commission's regulations and licensing requirements and the applicant's operating and emergency procedures.

(c) The applicant shall establish and submit to the Commission a description of its procedures for verifying and documenting the certification status of its radiographers and for ensuring that the certification of individuals acting as radiographers remains valid.

(d) The applicant shall submit to the Commission written operating and emergency procedures as described in § 34.45.

(e) The applicant shall establish and submit to the Commission its program for annual inspections of the job performance of each radiographer and radiographer's assistant as described in § 34.43(d).

(f) The applicant shall submit a description of its overall organizational structure as it applies to the radiation safety responsibilities in radiography, including specified delegations of authority and responsibility.

(g) The applicant shall designate and identify a Radiation Safety Officer responsible for implementing the licensee's radiation safety program. The Radiation Safety Officer shall meet the qualifications and duties described in § 34.42.

(h) If an applicant intends to perform leak testing of sealed sources, the applicant shall identify the manufacturers and the model numbers of the leak test kits to be used. If the applicant intends to analyze its own wipe samples, the applicant shall establish procedures to be followed and submit a description of these procedures to the Commission. The description must include the --

(1) Instruments to be used;

(2) Methods of performing the analysis; and

(3) Pertinent experience of the person who will analyze the wipe samples.

(i) The applicant shall identify the location(s) of, and describe, all field stations and permanent radiographic installations.

(j) From (insert effective date of final rule) to (2 years after the final rule is published in the Federal Register):

(1) A license applicant may affirm that all individuals acting as radiographers will be certified in radiation safety by a certifying entity before commencing duties as radiographers. This affirmation is instead of describing its initial training program for radiographers in the subjects outlined in § 34.43 (f) and the means used to determine the radiographer's knowledge and understanding of these subjects, and;

(2) A licensee may substitute radiographer certification in place of the description of the means to determine the radiographer's knowledge and understanding of the subjects outlined in § 34.43(f).

(3) After (2 years after the final rule is published in the Federal Register), a license applicant and licensee shall comply with the requirement of § 34.43(a)(2).

13. A new heading for Subpart C [§§ 34.20-34.35] is added to read as follows:

Subpart C - Equipment

14. Section 34.20 is revised to read as follows:

§ 34.20 Performance requirements for radiography equipment.

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

(a) Each radiographic exposure device and all associated equipment must meet the requirements specified in American National Standard 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). This publication may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 and 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, 7920 Norfolk Avenue, Lower Level, Bethesda, Maryland, 20814. A copy of the document is also on file at the Office of the Federal Register, 800 North Capitol Street NW., Washington, DC 20408.

(b) In addition to the requirements specified in paragraph (a) of this section, the following requirements apply to radiographic exposure devices and associated equipment.

(1) Each radiographic exposure device must have attached to it by the user, 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 number and serial number of the sealed source;
- (iv) Manufacturer 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 and associated equipment is prohibited.

(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 routine operation.

(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) 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."

The label must not interfere with the safe operation of the exposure device or associated equipment.

(5) The guide tube must have passed the crushing tests for the control tube as specified in ANSI N432 and a kinking resistance test that closely approximates the kinking forces 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 radiographic operations.

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

(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 newly manufactured radiographic exposure devices and associated equipment acquired by licensees after January 10, 1992, must comply with the requirements of this section.

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

(f) All associated equipment acquired after January 10, 1996, must be labelled to identify that the components have met the requirements of this section.

15. Section 34.21 is revised to read as follows:

§ 34.21 Limits on levels of radiation for radiographic exposure devices, storage containers, and source changers.

(a) Radiographic exposure devices measuring less than 10 centimeters (4 inches) from the sealed source storage position to any exterior surface of the device must not have a radiation level in excess of 0.5 millisieverts (50 millirems) per hour at 15 centimeters (6 inches) from any exterior surface of the device. Radiographic exposure devices measuring a minimum of 10 centimeters (4 inches) from the sealed source storage position to any exterior surface of the device, and all storage containers for sealed sources or for radiographic exposure devices, must not have a radiation level in excess of 2 millisieverts (200 millirems) per hour at any exterior surface, and 0.1 millisieverts (10 millirems) per hour at 1 meter from any exterior surface. The radiation levels specified are with the sealed source in the shielded (i.e., "off") position.

(b) Paragraph (a) of this section applies to all equipment manufactured before January 10, 1992. After January 10, 1996, radiographic equipment other than storage containers and source changers must meet the requirements of § 34.20. Section 34.21 applies only to storage containers.

16. Section 34.22 is removed.

§ 34.22 [Removed]

17. Section 34.23 is revised to read as follows:

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

(a) Locked radiographic exposure devices and storage containers must be physically secured to prevent tampering.

(1) 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 or as otherwise may be authorized in § 34.51. In addition, during radiographic operations the sealed source assembly must be manually secured in the shielded position each time the source is returned to that position, in those exposure devices manufactured before January 10, 1992.

(2) Each sealed source storage container and source changer must 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 must 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.

(b) Radiographic exposure devices, source changers, and storage containers, before being moved from one location to another, must have the guide tubes and control cables disconnected, safety plugs or covers applied,

locked and physically secured to prevent accidental loss, tampering or removal of licensed material, and must be surveyed to assure that the sealed source is in the shielded position.

18. Section 34.24 is removed.

§ 34.24 [Removed]

19. Section 34.25 is revised to read as follows:

§ 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 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. Survey instruments must be checked for operability before use each day. This may be accomplished by evaluating the instrument response to the previously measured fields at the projection sheath port or the control cable sheath port on a radiographic exposure device.

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

(3) So that an accuracy within plus or minus 20 percent of the calibration standard 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.

20. Section 34.26 is removed.

§ 34.26 [Removed]

21. Section § 34.27 is revised to read as follows:

§ 34.27 Leak testing and replacement of sealed sources.

(a) The replacement of any sealed source fastened to or contained in a radiographic exposure device and leak testing of any sealed source must be performed only by persons specifically authorized by the Commission or an Agreement State to do so.

(b) Testing and recordkeeping requirements.

(1) Each licensee who uses a sealed source shall have the source tested for leakage at intervals not to exceed 6 months.

(2) The licensee shall maintain records of the leak tests in accordance with § 34.67.

(3) In the absence of a certificate from the transferor that a leak test has been made within the 6 months before the transfer, the sealed source may not be used until tested.

(c) Method of testing. The wipe of a sealed source must be performed using a leak test kit or method approved by the Commission or an Agreement State. The wipe sample must be taken from the nearest accessible point to the sealed source where contamination might accumulate. The wipe sample must be

analyzed for radioactive contamination. The analysis must be capable of detecting the presence of 185 Bq (0.005 microcurie) of radioactive material on the test sample and must be performed by a person specifically authorized by the Commission or an Agreement State to perform the analysis.

(d) Any test conducted pursuant to paragraphs (b) and (c) of this section which reveals the presence of 185 Bq (0.005 microcurie) or more of removable radioactive material must be considered evidence that the sealed source is leaking. The licensee shall immediately withdraw the equipment involved from use and shall have it decontaminated and repaired or disposed of, in accordance with Commission regulations. A report must be filed with the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, within 5 days of any test with results that exceed the threshold in this subsection, describing the equipment involved, the test results, and the corrective action taken. A copy of the report must be sent to the Administrator of the appropriate Nuclear Regulatory Commission's Regional Office listed in Appendix D of Part 20 of this chapter "Standards for Protection Against Radiation."

(e) A sealed source which is not fastened to or contained in a radiographic exposure device must have permanently attached to it a durable tag at least one (1) inch square bearing the prescribed radiation caution symbol in conventional colors, magenta, purple or black on a yellow background, and at least the instructions: "Caution (or Danger) -- Radioactive Material -- Do Not Handle -- Notify Civil Authorities (or Name of Company)."

(f) Each exposure device using depleted uranium (DU) shielding and an "S" tube configuration must be periodically tested for DU contamination. This test can be performed by the licensee using available test kits or method

approved by the Commission or an Agreement State, or the exposure device could be returned to the manufacturer for such testing. The analysis must be capable of detecting the presence of 185 Bq (0.005 microcuries) of radioactive material on the test sample and must be performed by a person specifically authorized by the Commission or an Agreement State to perform the analysis. This test must be undertaken at intervals not to exceed 12 months and should such testing reveal the presence of DU contamination, the exposure device must be removed from use and arrangements for repair or proper disposal in a facility licensed under 10 CFR Part 61 must be made. A record of the DU leak-test must be made in accordance with § 34.67.

22. Section 34.28 is removed.

§ 34.28 [Removed]

23. Section 34.29 is revised to read as follows:

§ 34.29 Quarterly inventory.

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

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

24. Section 34.30 is removed.

§ 34.30 [Removed]

25. Section 34.31 is revised to read as follows:

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

(a) The licensee shall visually check for obvious defects in radiographic exposure devices, storage containers, associated equipment, and source changers before use each day the equipment is used to ensure that the equipment is in good working condition and that required labeling is present. If defects are found, the equipment must be removed from service until repaired, and a record must be made in accordance with § 34.73.

(b) Each licensee shall have a program for inspection and routine maintenance of radiographic exposure devices, source changers, associated equipment and storage containers at intervals not to exceed 3 months or before the first use thereafter to ensure the proper functioning of components important to safety. Records of these inspections and maintenance performed must be made in accordance with § 34.73. If defects are found, the equipment must be removed from service until repaired, and a record must be made in accordance with § 34.73.

(c) The opening, repair, or modification of any sealed source must be performed by persons specifically authorized to do so by the Commission or an Agreement State.

26. Section 34.32 is removed.

§ 34.32 [Removed]

27. Section 34.33 is revised to read as follows:

§ 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

(1) Entrance controls of the type described in § 20.1601(a)(1) of this chapter; or

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

(b) The alarm system must be tested for proper operation at the beginning of each day the installation is used for radiographic operations. The test must include a check of the visible and audible signals by turning on the exposure device before using the room. Entrance control devices must be tested monthly. If a control device or alarm is operating improperly, it must be immediately labeled as defective and repaired before industrial radiographic operations are resumed. Test records must be maintained in accordance with § 34.75.

28. Section 34.35 is added to read as follows:

§ 34.35 Labels, storage, and transportation precautions.

(a) Labels.

(1) The licensee may not use a source changer or container to store licensed material unless the source changer or the container has securely attached to it a durable, legible, and clearly visible label. The label must

contain the radiation symbol specified in § 20.1904 of this chapter and the wording

CAUTION (OR DANGER)

RADIOACTIVE MATERIAL--DO NOT HANDLE

NOTIFY CIVIL AUTHORITIES (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 CFR Part 71, including documentation of the Quality Assurance (QA) program requirements outlined in § 71.105.

(b) Security precautions during storage and transportation.

(1) Locked radiographic exposure devices and storage containers must be physically secured to prevent tampering or removal by unauthorized personnel in accordance with the requirements in § 34.23. The licensee shall store licensed material in a manner which will minimize danger from explosion or fire.

(2) 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.

29. A new heading for Subpart D [§§ 34.41-34.57] is added to read as follows:

Subpart D - Radiation Safety Requirements

30. Section 34.41 is revised to read as follows:

§ 34.41 Conducting 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(b). The additional qualified individual(s) 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.

31. Section 34.42 is revised to read as follows:

§ 34.42 Radiation Safety Officer.

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.

(a) The RSO's qualifications must include:

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

and

(2) 2000 hours of documented experience in industrial radiographic operations, with at least 40 hours of formal classroom training with respect to the establishment and maintenance of a radiation protection program.

(b) The specific duties of the RSO include, but are not limited to, the following:

(1) To establish and oversee operating, emergency, and ALARA procedures as required by Part 20, and to review them regularly to ensure that the procedures are current and conform with these rules;

(2) To oversee and approve all phases of the training program for radiographic personnel so that appropriate and effective radiation protection practices are taught;

(3) To ensure that required radiation surveys and leak tests are performed and documented in accordance with these rules, including any corrective measures when levels of radiation exceed established limits;

(4) To ensure 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; and

(5) To ensure that operations are conducted safely and to assume control and have the authority to institute corrective actions including stopping of operations when necessary in emergency situations or unsafe conditions.

32. Section 34.43 is revised to read as follows:

§ 34.43 Training.

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

(1) Has been instructed in the subjects outlined in paragraph (f) of this part.

(2) 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 Materials Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC. 20555.

(3) 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; in the applicable sections of Parts 19, 20, and 71 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 radiography, and the licensee's operating and emergency procedures;

(4) Has demonstrated understanding of NRC regulations, the licensee's license, and the licensee's operating and emergency procedures by successful completion of a written examination.

(5) Has demonstrated competence in the use of the licensee's radiographic exposure devices, sealed sources, related handling tools, and survey instruments; and

(6) Has demonstrated understanding of the instructions in paragraph (a)(3) and (a)(5) of this section by successful completion of a field examination.

(b) 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; in the applicable sections of Parts 19, 20, and 71 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 radiography, and the licensee's operating and emergency procedures;

(2) Has demonstrated competence to use, under the personal supervision of the radiographer, the radiographic exposure devices, sealed sources, related handling tools, and radiation survey instruments that the assistant will use; and

(3) Has demonstrated understanding of the instructions in this paragraph (b) of this section by successfully completing a written test and a field examination on the subjects covered.

(c) The licensee shall provide annual safety reviews for radiographers and radiographer's assistants at least once during each calendar year.

(d) The licensee shall conduct an annual 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 radiographic operation at intervals not to exceed 12 months; and

(2) Provide that, if a radiographer or a radiographer's assistant has not participated in a radiographic operation for more than 6 months since the last inspection, the individual's performance must be observed and recorded when the individual next participates in a radiographic operation.

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

(f) The licensee shall include the following subjects in the training required in paragraph (a)(1) 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

(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 (pigtailed).

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

(iii) Maintenance of equipment.

(4) The requirements of pertinent Federal regulations; and

(5) Case histories of accidents in radiography.

(g) The licensee may, until (2 years after the final rule is published in the Federal Register), allow an individual who has not met the certification requirements of paragraph (a)(2) of this section to act as a radiographer after the individual has received training in the subjects outlined in

paragraph (f) of this section and demonstrated understanding of those subjects by successful completion of a written examination that was previously submitted to and approved by the Commission.

34. Section 34.44 is removed

§ 34.44 [Removed]

35. Section 34.45 is added to read as follows:

§ 34.45 Operating and emergency procedures.

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

(1) The handling and use of licensed sealed sources and radiographic exposure devices to be employed such that no person is likely to be exposed to radiation doses in excess of the limits established in 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, 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 and maintenance of radiographic exposure devices 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;

(9) The procedure(s) for identifying and reporting defects and noncompliance, as required by 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;
and

(13) Maintenance of records.

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

36. Section 34.46 is added to read as follows:

§ 34.46 Supervision of radiographers' assistants.

Whenever a radiographer's assistant uses radiographic exposure devices, uses sealed sources or related source handling tools, 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 personal presence at the site where the sealed sources are being used;

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

(c) The radiographer's watching the assistant's performance of the operations referred to in this section.

37. Section 34.47 is added to read as follows:

§ 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 a direct reading pocket dosimeter, an operating alarm ratemeter, and either a film badge or a thermoluminescent dosimeter (TLD). 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.

(2) Each film badge and TLD must be assigned to and worn by only one individual.

(3) Film badges and TLDs must be replaced at least monthly.

(4) After replacement, each film badge or TLD must be promptly processed.

(b) Pocket 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 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. Acceptable dosimeters must read within plus or minus 30 percent of the true radiation exposure.

(d) If an individual's pocket dosimeter is found to be off-scale and the possibility of radiation exposure cannot be ruled out as the cause, the individual's film badge or TLD must be sent immediately for processing. In addition, the individual may not work with licensed material until a determination of the individual's radiation exposure has been made. This determination must be made 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 a film badge or TLD is lost or damaged, the worker shall cease work immediately until a replacement film badge or TLD is provided and the exposure is calculated for the time period from issuance to loss or damage of the film badge or TLD. The results of the calculated exposure and the time period for which the film badge or TLD was lost or damaged must be included in the records maintained in accordance with § 34.83.

(f) Reports received from the film badge or TLD 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) before 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 dose rate.

(3) Be adequate to alert the individual regardless of the environmental conditions (e.g., high ambient noise levels).

(4) Require special means to change the preset alarm function; and

(5) Be calibrated at periods not to exceed 12 months for correct response to radiation. The licensee shall maintain records of alarm ratemeter calibrations in accordance with § 34.83.

38. Section 34.49 is added to read as follows:

§ 34.49 Radiation surveys.

The licensee shall:

(a) Conduct surveys with a calibrated and operable radiation survey instrument that meets the requirements of § 34.25.

(b) Conduct an adequate survey of the radiographic exposure device with a radiation survey instrument after each exposure to determine that the sealed source has been returned to its shielded position.

(c) Conduct a survey when approaching the guide tube before exchanging films, repositioning the collimator, or dismantling equipment.

(d) Conduct an adequate survey with a 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.

(e) Conduct a survey of the storage area to ensure that radiation levels do not exceed the limits specified in 10 CFR 20.1301. These surveys must be performed initially with radioactive material present in the storage location and thereafter at the time of the quarterly inventory and whenever storage conditions change (i.e., increases in radioactive material present or changes in shielding or arrangement of the radioactive material).

(f) Maintain records in accordance with § 34.85.

39. Section 34.51 is revised to read as follows:

§ 34.51 Surveillance.

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 Part 20 of this chapter, except at permanent radiographic installations where all entryways are locked and the requirements of § 34.33 are met.

40. Section 34.53 is added to read as follows:

§ 34.53 Posting.

Areas in which 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 radiographic operations.

41. A new heading for Subpart E (§§ 34.61-34.91) is added to read as follows:

Subpart E - Recordkeeping Requirements

42. Section 34.61 is revised to read as follows:

§ 34.61 Records of specific license for 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 or until the Commission terminates the license.

43. Section 34.63 is revised to read as follows:

§ 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 retain each record for 3 years after it is made.

(b) These records must include the date, the individual making the record, the radionuclide, number of becquerels (curies), and make, model, and serial number of each sealed source and device, as appropriate.

44. Sections 34.65 - 34.91 are added to Subpart E to read as follows:

§ 34.65 Records of radiation survey instruments.

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

§ 34.67 Records of leak testing of sealed sources.

Each licensee shall maintain records of leak test results in units of becquerels (curies) and retain each record for 3 years after it is made.

§ 34.69 Records of quarterly inventory.

(a) Each licensee shall maintain records of the quarterly inventory and retain each record for 3 years after it is made.

(b) The record must include the quantities and kinds of byproduct material (including the model number, the serial number and manufacturer), location of sealed sources, the name of the individual conducting the inventory, and the date of the inventory.

§ 34.71 Utilization logs.

(a) Each licensee shall maintain current utilization logs at the address specified in the license, showing for each sealed source the following information:

(1) A description, including the make, model number, and serial number of the radiographic exposure device 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.

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

§ 34.73 Records of inspection and maintenance of radiographic exposure devices, storage containers, associated equipment, and source changers.

(a) Each licensee shall maintain records of defects found in daily checks and quarterly inspections and maintenance of radiographic exposure devices, storage containers, associated equipment, and source changers, and retain each record for 3 years after it is made.

(b) The record must include the date of check, name of inspector, equipment involved, any defects found, and repairs made.

§ 34.75 Records of alarm system and entrance control checks at permanent radiographic installations.

Each licensee shall maintain records of alarm system and entrance control device tests and retain each record for 3 years after it is made.

§ 34.79 Records of training and certification.

Each licensee shall maintain the following records (of training and certification) for 3 years after the record is made:

(a) Records of training of each radiographer and each radiographer's assistant. The record must include radiographer certification documents, certification status verification, copies of written tests, dates of field examinations, and names of individuals conducting the field examinations, and

(b) Records of annual safety reviews and annual inspections for each radiographer and each radiographer's assistant. The records must list the topics discussed during the annual safety review, the dates the annual safety review was conducted, and names of the instructors and attendees. For annual inspections, the records must also include a list showing the items checked and any regulatory non-compliances observed by the RSO.

§ 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.

Each licensee shall maintain the following exposure records:

(a) Daily pocket dosimeter readings and yearly operability checks for 3 years after the record is made.

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

(c) Reports received from the film badge or TLD processor until the Commission terminates the license.

(d) Records of estimates of exposures as a result of off-scale pocket dosimeters or lost or damaged film badges or TLDs 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 placing the device in storage in accordance with § 34.49(e) for 3 years after the record is made, if that survey is the last one performed in the work day.

§ 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 Documents and records required at field stations and permanent installations.

Each licensee shall maintain copies of the following documents and records sufficient to demonstrate compliance at the field station and permanent installation:

- (a) A copy of Parts 19, 20, and 34 of NRC regulations;
- (b) The license authorizing the use of licensed material;
- (c) Operating and emergency procedures required by § 34.45;
- (d) Records of radiation survey instrument calibrations required by § 34.65;
- (e) Records of leak test results required by § 34.67;
- (f) Quarterly inventory records required by § 34.69;
- (g) Utilization records required by § 34.71;
- (h) Records of inspection and maintenance required by § 34.73;
- (i) For permanent installations, records of alarm system and entrance control checks required by § 34.75;
- (j) Training and certification records required by § 34.79;
- (k) Survey records required by § 34.85;
- (l) Personnel monitoring records as required by § 34.83; and
- (m) Records of receipt and transfer of sealed sources required by § 34.63.

§ 34.91 Documents and records required at temporary jobsites and use or storage locations exceeding 180 days.

Each licensee conducting operations at a temporary jobsite shall maintain copies of the following documents and records at the temporary jobsite until

the radiographic operation is completed and at any storage location where radioactive material is stored for more than 180 days:

- (a) Operating and emergency procedures required by § 34.45;
- (b) Evidence of latest calibration of the radiation survey instruments in use at the site required by § 34.65;
- (c) Evidence of latest calibrations of alarm ratemeters and operability checks of pocket dosimeters as required by § 34.83;
- (d) Latest survey records required by § 34.85;
- (e) The shipping papers for the transportation of radioactive materials required by § 71.5 of this chapter; and
- (f) When operating under reciprocity pursuant to § 150.20 of this chapter, a copy of the Agreement State license authorizing use of licensed materials.

45. A new Subpart F is added to read as follows:

Subpart F - NOTIFICATIONS

46. Section 34.101 is added to read as follows:

§ 34.101 Notifications.

(a) In addition to the reporting requirements specified in § 30.50 and under other sections of this chapter, each licensee shall provide a written report to the U.S. Nuclear Regulatory Commission, Division of Industrial and Medical Nuclear Safety, Washington, DC 20555, with a copy to the Director, Office for Analysis and Evaluation of Operational Data, U.S. Nuclear

Regulatory Commission, Washington, DC 20555, 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) The licensee shall notify the appropriate NRC regional office in writing 30 days before conducting radiographic operations or storing radioactive material at any location not listed on the license in excess of 180 days.

47. A new subpart G is added to read as follows:

Subpart G - EXEMPTIONS

48. Section 34.111 is added to read as follows:

§ 34.111 Applications for exemptions.

The Commission may, upon application of any interested person or upon its own initiative, grant such exemptions from the requirements of the regulations in this part as it determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest.

49. A new Subpart H is added to read as follows:

Subpart H - Violations

50. Section 34.121 is added to read as follows:

§ 34.121 Violations.

(a) The Commission may obtain an injunction or other court order to prevent a violation of the provisions of

- (1) The Atomic Energy Act of 1954, as amended;
- (2) Title II of the Energy Reorganization Act of 1974, as amended; or
- (3) A regulation or order issued pursuant 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 Energy Act of 1954, as amended;

(ii) Section 206 of the Energy Reorganization Act;

(iii) Any rule, regulation, or order issued pursuant to the sections specified in paragraph (b)(1)(i) of this section.

(iv) Any term, condition, or limitation of any license issued under the sections specified in paragraph (b)(1)(i) of this section.

(2) For any violation for which a license may be revoked under section 188 of the Atomic Energy Act of 1954, as amended.

51. Section 34.123 is added to read as follows:

§ 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 conspiracy to violate, any regulation issued under one or more of sections 161b, 161i, or 161o of the Act. For purposes of section 223, all the regulations in Part 34 are issued under one or more of sections 161b, 161i, or 161o, except for the sections listed in paragraph (b) of this section.

(b) The regulations in 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.

52. Appendix A is revised to read as follows:

APPENDIX A to Part 34

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 or non-destructive testing;
2. Make its membership available to the general public nationwide that is not restricted because of race, color, religion, sex, age, national origin or handicap;
3. Have a certification program open to nonmembers;
4. Be an incorporated, nationally recognized organization, that is involved in setting national standards of practice within its fields of expertise;
5. Have a permanent full-time 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 assurance 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 certification program;
8. Have a committee, whose members can carry out their responsibilities impartially, to review complaints against certified individuals and to determine appropriate sanctions;

9. 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;

10. 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; and

11. Have procedures to 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;

12. Exchange information about certified individuals with the Commission and the ^{Government State} ~~independent certifying~~ organizations and allow periodic review of its certification program and related records;

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 that individuals (a) receive training in the topics set forth in § 34.34(f) of this part, 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 section 34.43(f) to this part; (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 whereby an application or certification would be considered null and void if the applicant or certified individual is prohibited from acting as a radiographer by a regulatory agency at the time of making the application;

5. Provide a certification period of not less than 3 years nor more than 5 years;

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

7. Include procedures whereby an individual's certification may be revoked, suspended, or restricted for willful or significant failure to comply with his or her employer's operating or emergency procedures, or the Commission's or an Agreement State's regulations;

8. Provide for automatic suspension of an individual's certification, based on Commission or Agreement State action prohibiting the individual from acting as a radiographer;

9. Provide for sanctions imposed against certified individuals that are at least as severe as any action taken by the Commission or an Agreement State; and

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

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 whereby an application or certification would be considered null and void if the applicant or certified individual is prohibited from acting as a radiographer by a regulatory agency at the time of making the application;

5. Provide a certification period of not less than 3 years nor more than 5 years;

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

7. Include procedures whereby an individual's certification may be revoked, suspended, or restricted for willful or significant failure to comply with his or her employer's operating or emergency procedures, or the Commission's or an Agreement State's regulations;

8. Provide for automatic suspension of an individual's certification, based on Commission or Agreement State action prohibiting the individual from acting as a radiographer;

9. Provide for sanctions imposed against certified individuals that are at least as severe as any action taken by the Commission or an Agreement State; and

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

9. 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;

10. 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; and

11. Have procedures to 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;

12. Exchange information about certified individuals with the Commission and the ~~independent certifying organizations~~ ^{Agreement State} and allow periodic review of its certification program and related records;

13. Provide a description to the Commission of its procedures for choosing examination sites and for providing an appropriate examination environment.

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All certification programs must:

1. Require that individuals (a) receive training in the topics set forth in § 34.34(f) of this part, 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 section 34.43(f) to this part; (b) satisfactorily completed a minimum period of on-the-job training; and (c) has received verification by an

III. Requirements for Written Examinations.

All examinations must be:

1. Designed to test an individual's knowledge and understanding of the topics listed in section 34.43(f) or equivalent Agreement State requirements;
2. Written in a multiple-choice format;
3. Written at a ninth-grade reading comprehension level;
4. Scientifically-analyzed, before use, to ensure that the questions are not biased or misleading, and that the examination of one certifying entity will produce a result equivalent to that of another certifying entity;
5. Tested by at least 50 individuals before being used in an actual examination leading to certification of individuals; and
6. Composed of questions randomly selected from a population of questions that contains ten times as many questions as may be needed for any one examination, to ensure that it is unlikely that an examinee would retake the same examination.

PART 150 -- EXEMPTIONS AND CONTINUED REGULATORY AUTHORITY IN AGREEMENT STATES AND IN OFFSHORE WATERS UNDER SECTION 274

53. The authority citation for part 150 continues to read as follows:
AUTHORITY: Sec. 161, 68 Stat. 948, as amended, sec. 274, 73 Stat. 688 (42 U.S.C. 2201, 2021); sec. 201, 88 Stat. 1242, as amended (42 U.S.C. 5841).
Sections 150.3, 150.15, 150.15a, 150.31, 150.32 also issued under secs. 11e(2), 81, 68 Stat. 923, 935, as amended, secs. 83, 84, 92 Stat. 3033, 3039 (42 U.S.C. 2014e(2), 2111, 2113, 2114). Section 150.14 also issued under

sec. 53, 68 Stat. 930, as amended (42 U.S.C. 2073). Section 150.15 also issued under secs. 135, 141, Pub. L. 97-425, 96 Stat. 2232, 2241 (42 U.S.C. 10155, 10161). Section 150.17a also issued under sec. 122, 68 Stat. 939 (42 U.S.C. 2152). Section 150.30 also issued under sec. 234, 83 Stat. 444 (42 U.S.C. 2282).

54. A new § 150.15b is added to read as follows:

§ 150.15b Continued Commission authority pertaining to independent certifying organizations.

The Commission reserves the authority to establish minimum standards regarding industrial radiographer certification programs and independent certifying organizations, as described in Part 34 of this Chapter, and to identify acceptable certifying entities.

55. In § 150.33, paragraph (b) is revised to read as follows:

§ 150.33 Criminal penalties.

* * * * *

(b) The regulations in part 150 that are not issued under sections 161b, 161i, or 161o for the purposes of section 223 are as follows: § § 150.1, 150.2, 150.3, 150.4, 150.5, 150.7, 150.8, 150.10, 150.11, 150.15, 150.15a, 150.15b, 150.30, 150.31, 150.32, 150.33.

Dated at Rockville, Maryland, this ____ day of _____ 1993.

For the Nuclear Regulatory Commission.

Samuel J. Chilk,
Secretary of the Commission.

Appendix A - Initial Regulatory Flexibility Analysis
for Revision of 10 CFR Part 34

The Nuclear Regulatory Commission (NRC) is proposing to amend its regulations governing industrial radiography. The proposed rule would include additional safety requirements to enhance the level of protection of radiographers and the public and would clarify the regulations so that licensees may have a better understanding of what is expected in radiographic operations. The proposed rule includes a number of updated radiography regulations that have been adopted by many Agreement States. The format of the radiography regulations would be adjusted to place requirements into descriptive categories.

The radiography industry in the United States consists of approximately 700 firms, employing about 20,000 individuals, that perform radioisotope radiography either at fixed locations or at multiple temporary job sites. Of these firms, approximately 200 are NRC licensees employing about 3,400 radiographers with an additional 2,000 radiography supervisors and radiographers' assistants. This estimate is based on 1990 data for the number of individuals monitored for radiation exposure to comply with 10 CFR Part 20. The industry uses an estimated 3,500 radiographic exposure devices that employ either cobalt-60 or iridium-192 radioisotope sources. Roughly one-quarter of the firms conduct radiography at a single location and the other three-quarters work at multiple locations generally referred to as temporary jobsites.

Approximately 90 percent are considered to be "small entities" under the criterion established in Section 605(b) of the Regulatory Flexibility Act of

1980. Most of the radiography licensees are in the business of non-destructive testing in which radiography represents only a part of their total income. A few small firms work only in radiography. Much of the work in the field involves the inspection of welds in bridges, oil, gas, and other pipelines and in the steel framework of commercial buildings under construction so that the success and viability of the industry is closely tied to the economic health of the country. NRC surveys indicated that 76 percent of NRC radiography licensees had annual receipts of over \$500,000, and most of the remainder had annual receipts exceeding \$250,000.

In accordance with the Regulatory Flexibility Act of 1980 (5 U.S.C. 605 (b)), the Commission believes that this rule may, if promulgated, have a significant economic impact on a substantial number of small entities.

The proposed revisions to Part 34 are intended to provide additional safety requirements to enhance the level of protection of radiographers and the public and to clarify the regulations so that licensees may have a better understanding of what is expected in radiographic operations. The proposed rule includes a number of radiography regulations which have been adopted by the Agreement States.

The proposed revisions to Part 34 can be grouped into major and minor impacts. Of the five major impacts, the proposed requirement to have a second qualified individual at temporary jobsites may have a significant effect on small entities, who would be more likely to use single-person crews. It should be recognized that under the current rule many licensees already need to have, at least, two qualified individuals present at a temporary jobsite to maintain direct surveillance of radiographic operations so as to protect against any unauthorized entry into the restricted area. Therefore, this

proposed requirement will only impact those operations where two individuals are not currently required. It was assumed in the draft Regulatory Analysis that approximately 25 percent of NRC licensees who perform radiography at temporary jobsites will need to hire and train additional staff to meet the proposed requirement. Other assumptions used in the draft Regulatory Analysis were that each of these 50 licensees would need to hire 3-4 additional workers, and that the cost of each assistant is \$24,000 per year including benefits.

The other major impacts include mandatory certification requirements for radiographers, additional training for radiographers' assistants, a specific requirement for a Radiation Safety Officer (RSO) who meets certain training requirements, requirements for permanent installation alarms, and additional requirements for alarm ratemeters. The estimated costs for all of these changes are significantly less than the costs associated with adopting the two-person rule. The initial costs to certify radiographers is approximately \$4080. The initial costs for each licensee to provide an additional eight hours of training for radiographers' assistants is approximately \$1,200. The initial costs to provide the additional training required to meet the proposed RSO requirements is \$3,700 per RSO. The initial costs to install alarms in permanent installations is estimated to be \$3,000. The initial costs to purchase additional upgraded alarm ratemeters is estimated to be \$1800. The other proposed revisions which are of a minor nature, would result in initial costs of \$700-\$800 per licensee.

In addition, the proposed rule includes a reduction in the number of field inspections to be conducted, from quarterly to annual. This reduction would lead to an estimated annual savings to each NRC licensee of

approximately \$16,000. The proposed rule also includes a reduction in the frequency for radiation survey instrument calibrations from 3 months to 6 months. This reduction would lead to an estimated annual savings to each NRC licensee of approximately \$1400.

Of these changes, the costs to adopt the two-person rule may have the most impact on a substantial number of "small entities"; however, the Commission believes that by requiring at least two qualified individuals to always be present when radiographic operations are being conducted, there will be a significant increase in assurance that operational safety measures and emergency procedures will be implemented effectively. The potential for a lowering of the risk of unintended public exposure can be viewed as a potential cost savings to the industry. This proposed rule does not duplicate or conflict with other Federal rules. No other alternative regulatory provisions that would minimize the economic impact on small entities were considered.

ENCLOSURE 3
DRAFT REGULATORY ANALYSIS

DRAFT REGULATORY ANALYSIS
OVERALL REVISION OF 10 CFR PART 34

1.0 Statement of the Problem

Part 34 of Title 10 of the Code of Federal Regulations was first published in 1965 as part of the recodification of Parts 30 and 31 for the purpose of simplifying and clarifying the format of the then-current regulations regarding radiography so that persons subject to byproduct material licensing regulations could better use and understand them. Numerous modifications of the original Part 34 have been issued since 1965, such as the performance requirements for radiography equipment and additional requirements related to equipment malfunctions, both of which were published in 1990, and the modification which was published in 1991, gives licensees the option to have their radiographers certified by the American Society for Non-Destructive Testing (ASNT) in lieu of certain training requirements.

In spite of numerous modifications to the original Part 34, certain regulatory requirements have been frequently misinterpreted and have led to increased numbers of enforcement actions. Also, the radiography industry seems to be prone to incidents involving radiation overexposures of its personnel. In the period 1980 through 1988, Nuclear Regulatory Commission (NRC) exposure data indicate that radiography accounted for over 25 percent of all radiation overexposures reported by NRC licensees, although radiographers make up only 4 percent of NRC non-reactor licensees. It is believed that misinterpretation of some of the regulatory requirements could be at least partially responsible. In view of this, it has been recommended that an

overall revision to Part 34 be undertaken to make it clearer and more compatible with other radiography regulations currently in use. Following the recommendations of the Commission, the staff has reviewed Part E of the "Suggested State Regulations for Control of Radiation" developed by the Conference of Radiation Control Program Directors Inc. (CRCPD), Part 31 of the Texas Regulations for the Control of Radiation, Chapter 5 of the Louisiana Radiation Regulations, and Section 18 of the Canadian "Atomic Energy Control Regulations" for the purpose of determining what revisions should be made to Part 34. In addition, recommendations made at the CRCPD Annual Meeting held in Wichita, Kansas on May 14, 1991; the All Agreement States Meeting held in Sacramento, California, in October 1991; and at the Office of State Programs' Workshops held in Mobile, Alabama, in May 1992, and Dallas, Texas, in November 1992, have been taken into consideration in developing the proposed revision.

1.1 The Industry

The radiography industry, which is the concern of this regulatory analysis, consists of approximately 700 firms in the United States that perform radioisotope radiography either at fixed locations or at multiple temporary jobsites. This industry employs full-time about 20,000 radiographers and radiographers' assistants. Of these firms approximately 200 are NRC licensees, employing about 6,000 workers and the remainder are licensees of the Agreement States. Roughly one quarter of the firms conduct radiography at a single location, the other three quarters work at multiple locations generally referred to as temporary jobsites. Approximately 90 percent of the licensees are considered to be "small entities" under the criterion established in Section 605(b) of the Regulatory Flexibility Act of

1980. The industry uses an estimated 3,500 devices, 1,400 of which are in use by NRC licensees. Typically, radiographic exposure devices employ either cobalt-60 or iridium-192 radioisotope sources. Most of the radiography licensees are in the business of non-destructive testing, in which radiography represents only part of their total income. However, a few small firms work only in radiography. Much of the work in the field (e.g., temporary jobsites) involves the inspection of welds in bridges, oil, gas and other pipelines, and in the steel framework of commercial buildings under construction.

1.2 Proposed Changes

The changes proposed in this revision of 10 CFR Part 34 are directed toward improving the safety performance in industrial radiography. The proposed revision specifies new requirements for two-person crews, requirements for mandatory certification of radiographers, a re-definition of a permanent radiographic installation, the designation of and the qualifications for a Radiation Safety Officer (RSO), specification of required documents at various radiographic operations sites, some additional training for radiographers' assistants, recordkeeping and labeling requirements, and a new requirement for leak testing of radiographic exposure devices. In addition, a number of the changes involve a reorganization of the regulations for the purpose of clarification, and also includes some new definitions, as well as redefinition of some terms in the present regulation.

2.0 Objectives

The NRC is proposing to revise its regulations governing industrial radiography. The revision would include additional safety requirements to

enhance the level of protection of radiographers and the public and would clarify the regulations so that licensees will have a better understanding of what is expected in radiographic operations. There has not been an overall revision of Part 34 in many years during which time the Agreement States have updated their radiography regulations. This revision incorporates certain provisions of the updated Agreement State regulations. The format of the proposed revision has been modified to place requirements into categories which describe the type of requirements that are found in each subpart.

3.0 Alternatives

The alternatives are to revise Part 34 as planned, to take no action at this time and continue in the status quo, or to clarify and update the existing Part 34, but impose no new substantive requirements.

Alternative 1 - Revise Part 34 as Planned

Adoption of this alternative would result in a comprehensive revision of 10 CFR Part 34. Since many of the proposed changes involve rearrangement of sections of the current regulation and rewording to make them more understandable, adoption of this alternative should serve to reduce the number of misinterpretations of the regulation which often result in enforcement actions for failing to follow safety requirements. The revision would also make Part 34 more consistent with Agreement State regulations.

The requirements for two-person crews, mandatory certification of radiographers, and Radiation Safety Officers are the most costly changes to Part 34. Most of the changes to Part 34 that would be brought about by this

rulemaking, e.g., recordkeeping, labeling, additional training for radiographers' assistants, and additional testing of certain radiographic exposure devices, should not have significant impacts on either large or small licensees. When compared to the potential safety benefits to be derived, the requirements for two-person crews should not pose an unnecessarily onerous burden since many licensees already use radiographers' assistants. The major impact of imposing the two-person rule will be on small licensees which currently only employ one or two radiographers and might need to double their workforce by hiring radiographers' assistants.

Alternative 2 - No Action

Alternative 2 is to take no action at this time and continue in the status quo. The principal impact of taking this alternative would be to continue a situation in which radiography contributes disproportionately to the number of overexposures occurring each year. In addition, this alternative would leave in place those portions of the current Part 34 that are inconsistent with the regulations of many Agreement States, which would continue to lead to confusion on what requirements are in place when radiographers work both in Agreement States and in States which are under NRC jurisdiction.

Alternative 3 - Clarify and Update the Existing Part 34, but Not Impose the Two-Person Rule.

Under this alternative, the NRC would modify the current Part 34 to clarify and update ambiguous and out-moded requirements. However, the provision for the two-person rule that would impact on licensees would not be

proposed. This alternative ignores some of the primary benefits sought in the revision of Part 34.

4.0 Impacts

Alternative 1 - Revise Part 34 as Planned

1. NRC

Adopting Alternative 1 should not have a significant impact on NRC resources to review license applications since most of the additional requirements in the proposed revision will not require license amendments. Little additional time will be needed to inspect implementation of the additional requirements. Currently, it takes a week to review a license application, and three-quarters to 1 day to inspect a licensee. The additional requirements specified in the proposed rule should not substantially increase either application review or inspection time.

2. Licensees

The discussion of the impacts of the proposed rulemaking on NRC licensees is divided into those that will have major impacts resulting from substantive new requirements, and those that will have minor impacts resulting from requirements such as additional recordkeeping and device testing. The impacts for Agreement States were not included in this assessment since many Agreement States already require a number of the proposed requirements. Although only the States of Texas, Illinois, and North Dakota have adopted mandatory radiographer certification requirements, the number of radiographers tested represent approximately 25 percent of the radiographers in all Agreement States.

a. Major Impacts

i. Two Person Crews

Two-person crews may add to the costs of performing radiography at locations where there is no permanent radiographic installation. Nonetheless, a number of Agreement States have had such a requirement in their regulations for several years, and consider it both necessary and beneficial. In many of these States the requirement is to have a minimum of two fully-qualified radiographers to be in compliance. In these States radiographers' assistants or radiographer trainees, although present and working at the jobsite, are not considered to be part of the required two-person crews. The NRC, however, is proposing that the two-person crew needs to be composed of only one qualified radiographer and that the other person may be an individual who meets at least the qualifications of a radiographer's assistant. Radiographer's helpers, who are used by some of the larger radiography licensees to patrol and survey radiation boundaries and who are not trained in radiation safety to the level of a radiographer's assistant, would not be considered to be members of the two-person crews.

As stated previously, some three-quarters of the industrial isotope radiography occurs at locations other than permanent radiographic installations. It is assumed that approximately one-third (2,000) of the radiography personnel discussed in Section 1.1 are radiographers' assistants. It is further assumed, for the purpose of estimating the cost of the two-person crew amendment, that assistants are utilized at 85 percent of the jobsites under the present regulations. NRC regulations have always required licensees to maintain surveillance of radiographic operations to protect

against unauthorized entry into a high radiation area. In many cases, this would require the presence of more than one qualified individual, so that many NRC licensees are already using two or more individuals at temporary job sites. This means that two-person crews that meet the minimal NRC requirements specified in the previous paragraph already exist. Therefore, imposition of this requirement will impose additional costs only in those cases where licensees are in the habit of using only single person crews. Further, it was pointed out at a recent All Agreement States meeting, that if this requirement were imposed on all radiography licensees uniformly (which would include Agreement State licensees, many of whom already require two-person crews), all licensees would be operating on "a level playing field" with no licensee having an economic advantage over the others by virtue of being able to use a single person crew. The additional cost of implementing this requirement is estimated to be \$24,000 per licensee to hire an additional assistant. This figure was arrived at using the following: a radiographer's assistant who is paid \$12 per hour (including benefits), and works 2,000 hours per year, earns \$24,000 per year. For the majority of licensees, this should not result in any impact since many are already using two-person crews. It is estimated that approximately 25 percent of licensees who perform radiography at temporary jobsites would be required to hire additional staff to meet this requirement. These licensees could be expected to hire 3-4 additional workers, and at \$24,000 per assistant per year, the resulting licensee cost would be \$96,000. The annual cost to industry would be approximately \$4.8 million, if 50 NRC licensees each were required to hire 4 radiographers' assistants at a cost of \$24,000 per assistant per year.

The primary reason for specifying a two-person crew is to reduce the likelihood that members of the public would be inadvertently exposed to radiation resulting from improper surveillance of the restricted area, or if an incapacitating injury to a radiographer should occur at a remote location while the source is exposed, the presence of a second individual could be an important factor in preventing unnecessary radiation exposures. It should be noted that while the cost of hiring and maintaining an additional assistant may be more expensive than installing and maintaining alarms on a "permanent installation" (see below), licensees would have the option of constructing a "permanent installation" at jobsites, where feasible, in lieu of providing a second person. However, the NRC recognizes that establishing a "permanent installation" per § 34.33 at a jobsite is not possible in many, if not most, instances.

ii. Mandatory certification for radiographers.

The proposed revision to the training requirements in section 34.43(a) to require mandatory certification for radiographers would require all radiographers to be certified. Currently, certification has been optional under Part 34, and to date about three hundred radiographers have been certified through the voluntary ASNT program.

In developing the voluntary radiographer certification rule (see 56 FR 11504; March 19, 1991), the ASNT estimated that the cost to the industry for certification to be approximately \$300 to \$400 per radiographer. These estimated costs consist of \$95 for examination and certification fees for ASNT members and \$140 for examination and certification fees for non-members. The remainder represents estimates for travel, food, and lodging for persons

applying for certification. Travel costs, which represented a significant fraction of the total cost, could not be estimated with certainty because the number of locations at which the examination would be offered was uncertain. However, ASNT has indicated that it expects to offer the examination at as many locations as possible. Therefore, most examinees could travel to and from the testing site by automobile the same day, thus eliminating lodging costs. Under these circumstances, the staff estimates the cost of travel and food to be about \$100. The ASNT certification is valid for 3 years, and those who qualify for re-certification without examination will be charged \$55 for members and \$100 for non-members. Individuals who fail the examination will be charged \$60 to re-take the examination. For the purpose of this analysis, the cost is estimated to be \$240 (\$140 ASNT fee and \$100 travel costs) per radiographer, and \$4,080 per NRC licensee, assuming 17 radiographers per NRC licensee. The cost for re-certification is estimated to be \$200 (\$100 ASNT fee + \$100 travel costs) per radiographer. This may be an overestimate since many radiographers will not require re-testing. This would result in an initial industry fee of \$816,000 for all NRC licensees, and an annual estimated O&M cost of \$220,000, based on 1,100 radiographers being re-certified per year with each certification remaining valid for 3 years. This translates into an annual cost for each licensee of \$1,100.

iii. Additional Training of Radiographers' Assistants

The proposed paragraph 34.43(b)(1) will require that the radiographers' assistants be given instruction in the following portions of 10 CFR: §§ 30.7, 30.9, 30.10, and applicable sections of Parts 19, 20, and 71. They must also be given instruction in applicable Department of Transportation

(DOT) regulations and in the NRC license(s) under which the radiographer will perform radiography. This is in addition to the current requirements to provide instruction in the licensees operating and emergency procedures. It is estimated that this requirement will require an additional day of training for all radiographers' assistants. By assuming that there are 2,000 assistants for 200 NRC licensees, that the assistants are paid a salary of \$12 per hour (including benefits), and given 8 hours of instruction, this would result in a cost of \$96 per assistant per licensee, plus a cost of \$240 (\$30/hr X 8 hours) in salary and benefits of the Radiation Safety Officer's time to conduct the training. By using the estimate that one-third of the workers are assistants, this would result in a one-time cost of \$1,200 per licensee, assuming the RSO conducted the training of all assistants at the same time. This would result in an additional one-time impact of \$240,000 for the estimated 200 NRC licensees. For licensees required to hire additional assistants (using the assumptions in Section i.), the cost would be an additional \$624 per NRC licensee, or an additional one-time cost to industry of \$31,200, assuming that 25 percent of licensees would need to hire additional workers. There could be an additional annual cost of \$336 per licensee to train any additional staff hired, which would result in an annual industry cost of \$67,200, assuming each licensee had to hire one radiographer's assistant per year.

iv. Radiation Safety Officer

The requirement in Section 34.13(g) to designate a Radiation Safety Officer (RSO) is new. Currently, Regulatory Guide 10.6, which describes the information applicants must submit in applying for a license, requests the applicants to submit the name of the individual who would be responsible for

the supervision of the radiation safety program. In addition, the guide states that this individual should be a qualified radiographer and have had a minimum of one year of actual experience as a radiographer, but the guide does not specifically list the duties of this individual. Proposed Section 34.42 would list both the qualifications and the specific duties of the RSO.

The first item listed under the RSO's qualifications in proposed Section 34.42, namely, the requirement to complete the training and testing requirements for a qualified radiographer, should not have any significant impact. The second item requires that the RSO have 2 years of documented experience in industrial radiography as a qualified radiographer with at least 40 hours of additional formal classroom training with respect to management of radiation protection programs. It is believed that the additional required 40 hours of formal classroom training in management of radiation protection programs will cost each licensee \$3,700 -- \$1,500 for the training, \$500 for the transportation to and from the training, \$500 for the per diem while attending the training, and \$1,200 in salary and benefits (\$30/hr X 40 hours). This results in an initial cost of \$740,000 for the estimated 200 NRC licensees. (It should be noted that this training is a one-time cost.) Also, this estimate assumes that there are currently no RSOs who would meet the requirements of the proposed revision, which is unlikely.

v. Permanent Radiographic Installations

Although the current regulation requires both visible and audible warning signals to be installed at "permanent radiographic installations," some licensees have misinterpreted the requirement and used as temporary

jobsites, what the NRC considered to be permanent installations without the necessary warning signals. The proposed rulemaking would both revise the definition of permanent radiographic installations and require two-person crews when radiographic operations are being conducted outside of a permanent radiographic installation. As noted above, one-quarter, or 50, of the NRC licensees operate at single locations. This would result in an initial cost of \$3,000 per facility for installation of alarms, and an annual cost of \$200 for maintenance and testing per NRC licensee. It is unlikely that all NRC licensees will need to install additional alarms. If an assumption is made that the 50 licensees cited above are the only ones with radiography cells, and that one-half would need to install additional alarms to meet the proposed requirements, there would be an initial industry cost of \$75,000, and an annual maintenance cost of \$5,000 for these licensees.

vi. Alarm Ratemeters

The proposed section 34.47(g)(1) would require that the alarm ratemeter be capable of alerting the wearer regardless of the environmental conditions. For use in high ambient noise areas, ratemeters could be equipped with either a vibrating alarm that could be felt by the wearer or a small speaker built into hearing protectors to meet this requirement.

By assuming that each licensee has an average of seven two-person teams, and three of these teams would need to have alarm ratemeters equipped with an alternate means of alerting the wearer, each licensee would need to purchase six of the newly equipped devices. The current cost of an alarm ratemeter is approximately \$150. It can be expected the cost for an alarm ratemeter with

an alternate means of alerting the wearer would be double that or \$300. The impact on the industry will then be \$360,000 based on 200 licensees needing six devices each at a cost of \$300 per device (\$1,800 per licensee). The annual operating and maintenance (O&M) cost for these devices is assumed to be \$100 per device. This results in the industry spending \$120,000 on annual O&M based on 200 licensees having six devices each at an O&M cost of \$100 per device (\$600 per licensee).

2.b. Minor Impacts

i. Monthly Replacement of TLDs

Exchange periods for either personnel film badge dosimeters or personnel thermoluminescent dosimeters (TLDs) are not included in the existing 10 CFR Part 34, but the proposed revision will require that both types of personnel dosimeters be replaced monthly. Current practice is for film badge dosimeters to be replaced on a monthly basis because of their sensitivity to environmental factors which cause them to fog or fade, so that it is unlikely there will be an impact on licensees who use film for their personnel dosimeters. In the case of TLDs, however, the replacement period has customarily been three months, in part because the old 10 CFR 20.401 required reporting for periods of time not exceeding 1 calendar quarter. Recent surveys of the dosimetry processing industry indicate that approximately 80 percent of personnel dosimetry is conducted using film badges and only 20 percent use TLDs. In the case of NRC licensees this means that some 20 percent of the 6,000 radiographers and assistants (or 1200) use TLDs. If NRC licensees are assumed to use a quarterly exchange of TLDs, the annual cost involves processing 4,800 (4 X 1,200) dosimeters at an average cost of \$4 per

processing or a total of \$19,200. The proposed revision would require the processing of 9,600 (8 X 1,200) additional TLDs at an annual cost of \$38,400 to NRC licensees, or \$192 per licensee.

ii. Testing for Depleted Uranium (DU)

The proposed revision requires that licensees leak-test those radiographic exposure devices containing DU shielding in which the source is moved from its shielded position in the device to an unshielded position outside the device by means of a control cable. The purpose of the leak-test is to verify that the "S" tube, through which the cable moves, has not been degraded to a state where the control cable is eroding the depleted uranium shielding. Such leak-tests are to be performed at intervals not to exceed 12 months and may be performed by the licensee using acceptable leak-test kits. Alternatively, the licensee may return the device to the manufacturer for performance of the leak-test. The estimated cost for such a leak-test is estimated to be \$25 if the licensee performs the leak-test and \$75 if the leak-test is performed by the manufacturer. Using an average cost of \$50, the cost to NRC licensees to perform the leak-test on the approximately 1,400 devices in use is \$70,000 annually, or approximately \$350 per licensee.

iii. Documents Required at Field Stations, Permanent Installations, and Temporary Jobsites

Sections 34.89 and 34.91, respectively, will require certain documents to be available at field stations, permanent installations, and temporary jobsites. A field station is a location where radiography equipment is stored and from which equipment is dispatched to temporary jobsites where radiography is to be conducted. Since most permanent installations are located at a

licensee's place of business where all records are normally stored, this proposed requirement would only be an impact on any additional permanent installations at other locations. The impact on NRC licensees to have these documents available will be a \$150 cost per licensee per year and to all NRC licensees the cost would be \$3,000. This was determined assuming a \$10 per hour labor rate (including benefits), accomplished in 15 hours.

iv. Recordkeeping, Notifications and Labeling

Other changes that appear in the proposed revision fall into the realm of recordkeeping and include the addition of required signatures, listing of serial numbers of devices in use in the utilization logs, records of DU tests performed, and written notifications whenever a material will be used or stored for more than 180 days at a location not listed on the license. Except for new requirements for making certain documents and records present at field stations, permanent installations, and temporary jobsites (previously discussed), these changes should have little impact on licensees. The impacts for the additional recordkeeping requirements are addressed in the OMB Clearance Package required under the Paperwork Reduction Act (P.L. 96-511).

v. Field Inspections of Radiographers and Radiographers' Assistants

The frequency of field inspections of radiographers and radiographers' assistants has been changed from every 3 months to annual. These changes will provide some relief to licensees by reducing the costs of field inspections of radiographers by 75 percent. Assuming that the licensee's RSO performs the field inspections and assuming further that each inspection takes 3 hours and the RSO's salary and benefits are of the order of \$30 per hour, the cost to

each NRC licensee is about \$590 per inspection, assuming a cost of \$500 for travel expenses for the RSO per inspection. Under the current regulation, inspections are required every 3 months for each worker. Assuming that each licensee has an average of seven teams in the field based on the number of registered radiography devices, the current cost to each licensee is \$165,200 per year or about \$6,608,000 to the NRC licensed industry. The proposed revision to change the inspection period to annually would result in an annual savings to all NRC licensees of \$4,956,000 per year, or an average of about \$24,780 per licensee.

vi. Radiation Survey Instruments

The existing rule requires that radiation survey instruments be calibrated at 3 month intervals and a record maintained of the calibrations. The calibration interval is being extended from 3 months to 6 months because survey instruments are now sturdier and more reliable. These changes will provide some relief to licensees by reducing the costs of radiation survey instrument calibration by 50 percent. The cost of calibrating a radiation survey instrument is approximately \$100 per instrument. Assuming that there are 1,400 radiation survey instruments that must be calibrated every 6 months instead of every 3 months the reduction in burden would be \$280,000 per year for all licensees or \$1,400 per licensee.

Alternative 2 - No Action

The primary consequences of this alternative would be that the NRC would not implement the Agreement States' recommendations and would deny the International Union of Operating Engineers (IUOE) petition for rulemaking.

Licenses would be free to voluntarily implement some or all of the recommendations, however, they would not be required to do so under 10 CFR Part 34. This would continue the status quo of having different standards in the Agreement States and would not have the potential benefit of reducing the frequency of overexposures in radiography.

Alternative 3 - Clarify and Update the Existing Part 34, but Not Impose the Two-Person Rule.

The consequences of this alternative would be threefold. First, the modification would lessen the consistency of the revision with the Agreement States' regulations. A number of Agreement States presently have incorporated a two-person rule. Second, the IUOE petition for the two-person rule would not be addressed. As identified in the petition, this could result in the following problems occurring: 1) When working in a congested area, it is extremely difficult to keep the area under constant surveillance; 2) When working in deep trenches, it is difficult to keep above ground areas under surveillance; 3) Whenever possible, radiographers often work after other trades and crafts have left the area. In case of an accident involving licensed material, the radiographer cannot leave the area if a radiation danger exists in order to notify the proper authorities; and 4) In the event of an accident involving physical injury at a remote jobsite, the radiographer could be placed in a life-threatening situation. Third, in the case of a radiographer being injured, the source may be left exposed and there would be no one available to place the source in its stored position or to prevent the public from entering into the area and receiving an unwarranted exposure to radiation.

5.0 Decision Rationale

As indicated in the Alternative section above, the decisions available are to revise 10 CFR Part 34, take no action at this time, or modify the revision and proceed with the rulemaking. The first alternative incorporates the recommendations of the Agreement States and thus improves the consistency of the revision with Agreement States' regulations. It also provides additional assurance of protection of public health and safety with the incorporation of the two-person rule. The second alternative is to make no changes at all. The third alternative would not incorporate the two-person rule, thereby eliminating the added assurance of protection of public health and safety. In addition, modification of the proposed revision would lessen the consistency of the revision with the Agreement States' regulations. The changes presented in the proposed revision were carefully chosen on the basis of recommendations from the radiography industry, including users and manufacturers of radiography equipment, and the Agreement States.

6.0 Implementation

The proposed revision will be published in the Federal Register and comments will be solicited on the rule as well as on the supporting documents, including this draft regulatory analysis. Appropriate changes will be made to the proposed revision based on comments received, after which a final rule will be published in the Federal Register. The final rule will include an effective date for implementation of the changes to allow licensees time to make the required changes.

7.0 Costs

A summary of the costs of the above amendments, based on the estimates made above are given in Tables 1 and 2.

Table 1
Implementation and Annual Operating and Maintenance Costs
for the New Requirements

New Requirement	Implementation Costs (US Dollars)		Annual Operating and Maintenance Costs (US Dollars)	
	All NRC Licensees	Per NRC Licensee	All NRC Licensees	Per NRC Licensee
Two-Person Rule(a)	4,800,000	96,000	4,800,000	96,000
Mandatory Certification of Radiographers	816,000	4,080	220,000	1,110
Radiation Safety Officer	740,000	3,700	0	0
Permanent Facility Alarms(b)	75,000	3,000	5,000	200
Additional Training for Radiographers' Assistants(c)	240,000 31,200	1,200 624	67,200	336
Alarm Ratemeters	360,000	1,800	120,000	600
Additional TLD Exchanges	38,400	192	38,400	192
Depleted Uranium Tests	70,000	350	70,000	350
Documents required at Field Stations and Temporary Jobsites	30,000	150	30,000	150
Recordkeeping and Labelling(d)				
Reduced Rad. Survey Inst. Calibrations	-280,000	-1,400	-280,000	-1,400
Reduced Field Inspection Costs	-4,956,000	-24,780	-4,956,000	-24,780
Total(e)	1,964,600	84,916	1,368,600	72,748

(a) The costs for the Two-Person Rule only reflect those licensees (25%) that would have to hire additional radiographer's assistants.

(b) The cost of \$3000 would only apply to those licensees who have permanent installations. It is assumed that this would affect 25 licensees.

(c) The cost of \$1,200 would apply to all NRC licensees. The additional costs of \$31,200 and \$624 only applies to those licensees that would have to hire additional radiographers' assistants.

(d) The cost for these is insignificant and has not been itemized.

Table 2
Implementation Costs for An Individual NRC Licensee

New Requirement	An NRC Licensee that would have to hire four additional assistants (US Dollars)	An NRC Licensee that would not have to hire four additional assistants (US Dollars)
Two-Person Rule	96,000	0
Mandatory Certification of Radiographers	4,080	4,080
Radiation Safety Officer	3,700	3,700
Permanent Facility Alarms	3,000	3,000
Additional Training of Radiographers' Assistants	1,824	1,200
Alarm Ratemeters	1,800	1,800
Additional TLD Exchanges	192	192
Depleted Uranium Tests	350	350
Documents Required at Field Stations	150	150
Recordkeeping and Labeling(f)		
Reduced Rad. Survey Inst. Calibrations	-1,400	-1,400
Reduced Field Inspection Costs	-24,780	-24,780
Total	84,916	-11,708

(e) The total costs represent costs likely to be incurred by those licensees that would have to hire four additional radiographers' assistants. It is unlikely that these high costs will apply to more than 25% of NRC licensees. For the majority of licensees, the initial costs will be \$332, with a net annual saving due to the reduction in field inspections.

(f) The cost for these is insignificant and has not been itemized.

ENCLOSURE 4
ENVIRONMENTAL ASSESSMENT

ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT
REVISION OF 10 CFR PART 34
SAFETY REQUIREMENTS FOR INDUSTRIAL RADIOGRAPHY

The Nuclear Regulatory Commission is amending its regulations that apply to industrial radiography to improve radiography safety.

Environmental Assessment

Identification of Final Action

Part 34 of Title 10 of the Code of Federal Regulations specifies the radiation safety requirements for radiographic operations, including performance requirements for industrial radiographic exposure devices, personal radiation safety requirements for radiographers and precautionary procedures in radiographic operations. This revision will specify requirements for the use of, at least, two qualified individuals at temporary jobsites, additional training for radiographers' assistants (§ 34.43), designation of a Radiation Safety Officer (§ 34.42), and describing permanent radiographic installations including installation of alarms or access control devices.

Need for the Final Action

A number of revisions to the Suggested State Regulations have made the NRC regulations different from many of the Agreement States' regulations. There has not been an overall revision of Part 34 in many years while a number

of other NRC rules have been updated. A decision was made to develop an overall revision to 10 CFR Part 34 with the intent of clarifying the regulation so that licensees may have a better understanding of what is expected in radiographic operations. In addition, the format of the proposed rule has been revised to place requirements into categories which describe the type of requirements that are found in the subpart.

Environmental Impacts of the Final Action

The revision of 10 CFR Part 34 should have no environmentally significant impact. The changes proposed in this revision of 10 CFR Part 34 are directed toward improving the safety performance in industrial radiography. The proposed revision specifies new requirements for two-person crews, a re-definition of a permanent radiographic installation, the designation of and the qualifications for a Radiation Safety Officer (RSO), specification of required documents at various radiographic operations sites, some additional training for radiographers' assistants, recordkeeping and labeling requirements, and a new requirement for leak testing of radiographic exposure devices. In addition, a number of the changes involve a reorganization of the regulations for the purpose of clarification, and also includes some new definitions, as well as redefinition of some terms in the present regulation.

Any of the proposed changes involving requirements which would effect energy, water, or materials will be insignificant and no environmental or radiation impact will be involved.

Alternatives to the Final Action

As required by § 102(2)(E) of NEPA (42 USC 4322(2)(E)), possible alternatives to the final action have been considered. The first alternative was to adopt the revisions.

A second alternative considered was to take no action.

A third alternative considered was to clarify and update the existing Part 34, but to impose no new substantive requirements.

Amendment of the existing regulations was chosen as the best alternative, because it was the only option which would address the primary benefits sought in the revision to Part 34.

Alternative Use of Resources

No alternative use of resources was considered.

Agencies and Persons Consulted

Consultations on the rule have been held with both Agreement State and industry representatives at the November 1992 workshop, which was held in Dallas, Texas.

Finding of No Significant Impact

The Commission has determined not to prepare an environmental impact statement for the final rule.

Based on the foregoing environmental assessment, we conclude that this amendment will not have a significant effect of the quality of the environment.

ENCLOSURE 5
DRAFT PUBLIC ANNOUNCEMENT

NRC PROPOSES AMENDMENTS TO REGULATIONS
GOVERNING SAFETY OF RADIOGRAPHY OPERATIONS

The Nuclear Regulatory Commission is proposing to amend its regulations governing the safety of radiography operations to further enhance the safety of radiographers and the public and to provide licensees with a better understanding of what is expected in radiography operations.

Radiography involves the use of radioactive materials to produce shadow images on film. The NRC has approximately 200 radiography licensees, and the 29 Agreement States (states which have assumed, by agreement, part of the NRC's regulatory authority) have an additional 500 licensees. Both NRC and Agreement State licensees often conduct business under both NRC and Agreement State jurisdiction.

The radiography regulations first were promulgated in 1965 and numerous modifications have been made since that time, the most recent in 1990 when requirements governing the performance of radiography equipment and additional reporting requirements governing equipment malfunctions were added.

As proposed, the new amendments, which have been coordinated with the Agreement States and are responsive to a 1992 petition for rulemaking from the International Union of Operating Engineers, would, among other things:

-- require that two radiographers, or a radiographer and a radiographer's assistant, be present any time radiographic operations are conducted outside of a permanent radiographic installation, which would provide a significant increase in

assurance that operational safety measures and emergency procedures would be implemented effectively;

-- require that radiographers, in addition to meeting the existing training and qualification requirements, be certified by a certifying entity, which could be either an independent certifying organization or an Agreement State;

-- change the definition of "permanent radiographic installation" to be an enclosed shielded room, cell or vault in which radiography is performed, which should reduce any ambiguity as to what the term is intended to mean; in addition, a requirement for a daily check of visible and audible alarm signals would be added;

-- add a requirement to provide additional training for radiographers' assistants; instead of just receiving copies of the licensees' operating and emergency procedures and being tested on those documents, assistants would have to receive additional training to ensure that they are knowledgeable in regard to all pertinent NRC requirements; and

-- specify the duties of the radiation safety officer (RSO) and require additional training for this position.

Written comments on the proposed amendments to Part 34 of the Commission's regulations should be received by (date). They should be addressed to the Secretary of the Commission, Nuclear Regulatory Commission, Washington, D.C. 20555, Attention; Docketing and Service Branch.

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ENCLOSURE 6
DRAFT CONGRESSIONAL LETTER



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

The Honorable Joseph I. Lieberman, Chairman
Subcommittee on Clean Air and Nuclear Regulation
Committee on Environment and Public Works
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

The NRC has sent to the Office of the Federal Register for publication the enclosed proposed amendment to the Commission's rules in 10 CFR Part 34. The amendment if adopted would, in part, require licensees to require at least two radiographers or a radiographer and a radiographer's assistant to be present any time radiographic operations occur outside of a permanent radiographic installation; to designate a Radiation Safety Officer (RSO); to describe all permanent radiographic installations; and to require all radiographers to be certified by a certifying entity.

The Commission is issuing the proposed rule for public comment.

Sincerely,

Dennis K. Rathbun, Director
Office of Congressional Affairs

Enclosures:

1. Public Announcement
2. Federal Register Notice

cc: Senator Alan K. Simpson



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D. C. 20555-0001

The Honorable Philip R. Sharp, Chairman
Subcommittee on Energy and Power
Committee on Energy and Commerce
United States House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

The NRC has sent to the Office of the Federal Register for publication the enclosed proposed amendment to the Commission's rules in 10 CFR Part 34. The amendment if adopted would, in part, require licensees to require at least two radiographers or a radiographer and a radiographer's assistant to be present any time radiographic operations occur outside of a permanent radiographic installation; to designate a Radiation Safety Officer (RSO); to describe all permanent radiographic installations; and to require all radiographers to be certified by a certifying entity.

The Commission is issuing the proposed rule for public comment.

Sincerely,

Dennis K. Rathbun, Director
Office of Congressional Affairs

Enclosures:

1. Public Announcement
2. Federal Register Notice

cc: Representative Michael Bilirakis



UNITED STATES
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D. C. 20555-0001

The Honorable Richard H. Lehman, Chairman
Subcommittee on Energy and Mineral Resources
Committee on Natural Resources
United States House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

The NRC has sent to the Office of the Federal Register for publication the enclosed proposed amendment to the Commission's rules in 10 CFR Part 34. The amendment if adopted would, in part, require licensees to require at least two radiographers or a radiographer and a radiographer's assistant to be present any time radiographic operations occur outside of a permanent radiographic installation; to designate a Radiation Safety Officer (RSO); to describe all permanent radiographic installations; and to require all radiographers to be certified by a certifying entity.

The Commission is issuing the proposed rule for public comment.

Sincerely,

Dennis K. Rathbun, Director
Office of Congressional Affairs

Enclosures:

1. Public Announcement
2. Federal Register Notice

cc: Representative Barbara Vucanovich