UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR MATERIAL SAFETY AND SAFEGUARDS
WASHINGTON, D.C. 20555

August 15, 1991

NRC INFORMATION NOTICE NO. 91-49: ENFORCEMENT OF SAFETY REQUIREMENTS FOR RADIOGRAPHERS

Addressees:

All Nuclear Regulatory Commission (NRC) licensees authorized to use sealed sources for industrial radiography.

Purpose:

This information notice is being issued to alert licensees to new safety requirements, to remind licensees to perform required radiation safety surveys, and to describe related changes to NRC's Enforcement Policy. New rules went into effect on January 10, 1991, that, among other items: (a) require radiographers to wear audible alarm ratemeters, in addition to using survey meters; (b) provide for new reporting requirements; and (c) specify performance requirements for radiography equipment. It is expected that licensees will review this notice, distribute it to responsible staff, and consider actions, as appropriate, to ensure compliance with NRC requirements. Suggestions contained in this information notice do not constitute any new NRC requirements. However, you are responsible for ensuring that radiographic operations are performed in a safe manner, in accordance with license conditions and NRC regulations. No written response to this information notice is required.

Background:

On January 10, 1990, NRC published a final rule in the Federal Register (55 FR 843), establishing additional safety requirements for industrial radiography equipment (see Attachment 1). The rule requires use of audible alarm ratemeters (Section 34.33) and establishes reporting requirements for certain incidents (Section 34.30), and became effective on January 10, 1991. The rule also establishes new safety requirements for radiography equipment (Sections 34.20 and 34.21), which will be phased in from 1992 to 1996.

In addition to the new radiography safety requirements, the final rule also modified NRC's Enforcement Policy (10 CFR Part 2, Appendix C) to reflect the regulatory changes. Specifically, the modified Enforcement Policy put licensees on notice that the failure to implement the requirements for dosimetry and equipment by the required date will be considered a serious violation. Licensees who fail to use required radiation safety equipment and personnel monitoring devices will now be cited with a Severity Level III violation, which may lead to a civil penalty (monetary fine) or other appropriate enforcement action.

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Finally, licensees are reminded of the existing requirements to conduct radiation surveys, as stated in 10 CFR 34.43 and 20.201(b). Failure to survey will be now cited as a serious violation under the modified Enforcement Policy. Compliance with the 10 CFR Part 34 radiation safety survey requirements is critical for safe radiography operations.

Discussion:

NRC wants to emphasize to licensees that it is extremely important to perform appropriate surveys and use appropriate personnel monitoring equipment when using radiography sources. A number of significant overexposure incidents occurred in this past year, that might have been avoided if proper surveys had been performed and if alarming ratemeters had been worn (see Information Notice 91-23, "Accidental Radiation Overexposures to Personnel due to Industrial Radiography Accessory Equipment Malfunctions"). Since the final rule became effective on January 10, 1991, the use of alarm ratemeters is now required.

You should be aware that NRC staff takes strong enforcement action for failures to perform adequate surveys. In the past 18 months, NRC removed six radiographers from licensed activities for, among other reasons, failing to perform radiation surveys and willfully violating NRC regulations. In some cases, these violations caused significant overexposures or led to unnecessary exposure to a member of the general public. We issued orders suspending or modifying licenses for these failures, and we proposed substantial civil penalties.

The Enforcement Policy now gives the following example of a Severity Level III violation, which could lead to a civil penalty or other strong enforcement action:

> "Failure, during radiographic operations, to have present or use radiographic equipment, radiation survey instruments, and/or personal monitoring devices as required by Part 34."

In cases of willfulness, concealment, or repetition of similar serious violations, we will consider actions stronger than civil penalties, such as orders to modify, suspend, or revoke radiography licenses.

Based on inspections in the past year, we are concerned that radiographers working independently in the field are not always complying with regulations and license conditions. These lapses in radiation safety concern us, and we will take appropriate, strong enforcement action to prevent continued degradations in safety. To ensure that your radiography sources are used safely, we recommend that management conduct audits of your field radiography programs, in addition to the audits already required by 10 CFR 34.11(d). Licensee management should also meet with licensee radiographers to discuss management expectations and NRC's heightened concern regarding the safe use of these sources.

Radiography involves relatively large quantities of radioactive material that can be dangerous if not properly controlled. Performing radiography requires constant attention to detail and vigilant care because of its repetitive nature, frequently in difficult field conditions. Through strong internal radiation safety programs, including management audits, you can ensure that licensed material is being used in a safe manner.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the technical contact listed below or the appropriate regional office.

Richard E. Cunningham

Richard E. Cunningham, Director
Division of Industrial and
Medical Nuclear Safety
Office of Nuclear Material Safety
and Safeguards

Technical Contact: Scott W. Moore, NMSS
301-492-0514

Attachments:
1. 10 CFR Part 34
2. List of Recently Issued NMSS Information Notices
3. List of Recently Issued NRC Information Notices

UNITED STATES NUCLEAR REGULATORY COMMISSION

RULES and REGULATIONS

TITLE 10, CHAPTER 1, CODE OF FEDERAL REGULATIONS—ENERGY

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

Sec.

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

For the purposes of sec. 223, 68 Stat. 958, as amended (42 U.S.C. 2273): §§ 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 §§ 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)).

54 FR 854

§ 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.

30 FR 8185

§ 34.2 Definitions.

As used in this part:

"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;

"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.

51 FR 21736

51 FR 21736

51 FR 21736

§ 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 § 30.32 of this chapter.

49 FR 27923

§ 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.

53 FR 23382

§ 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

49 FR 19623

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 §§ 34.11, 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 § 34.3, Form NRC-313R is approved under control number 3150-0023.

[49 FR 19623]

Subpart A—Specific Licensing Requirements

§ 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 §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

[30 FR 8185]

(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 used 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 ANST-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)).

[56 FR 11504]

(6) Means to be used by the licensee to determine the radiographer's assistant's knowledge and understanding of and ability to comply with the operating and emergency procedures of the applicant;

[56 FR 11504]

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

[30FR8185]

(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:

(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.

[51 FR 21736]

(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

(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.

[30 FR 8185]

Subpart B—Radiation Safety Requirements

EQUIPMENT CONTROL

§ 34.20 Performance requirements for radiography equipment.

[55 FR 843]

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 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 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

[55 FR 843]

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 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.

55 FR 843

§ 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 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, 1993, radiographic equipment other than storage containers and source changers must meet the requirements of § 34.20, and § 34.21 applies only to storage containers (source changers).

55 FR 843

§ 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 § 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.

(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.

44 FR 50995

§ 34.23 Storage precautions.

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

§ 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 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.

53 FR 19240

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

30 FR 8185

(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 § 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.

53 FR 19240

(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 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."

30 FR 8185

(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."

53 FR 19240

§ 34.26 Quarterly inventory.

Each licensee shall conduct a quarterly physical inventory to account for all sealed sources received and possessed under his license. The records of the inventories shall be maintained for three

53 FR 19240

years from the date of the inventory for inspection by the Commission, and shall include the quantities and kinds of by-product material, location of sealed sources, and the date of the inventory.

§ 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:

53 FR 19240

(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.

10 FR 8185

§ 34.28 Inspection and maintenance of radiographic exposure devices, storage containers, and source changers.

44 FR 50805

(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.

53 FR 19240

(b) The licensee shall conduct a program for 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.

§ 34.29 Permanent radiographic installations.

44 FR 50805

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

(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.

53FR19240

(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.

Reporting

55 FR 843

§ 34.30 Reporting requirements.

(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.

PERSONAL RADIATION SAFETY REQUIREMENTS FOR RADIOGRAPHERS AND RADIOGRAPHERS' ASSISTANTS

§ 34.31 Training.

44 FR 50805

(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 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

44 FR 50805

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

(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.

§ 34.32 Operating and emergency procedures.

53 FR 19240

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:

41 FR 18645

(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;

30 FR 8185

(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

(i) Maintenance of records.

(j) The inspection and maintenance of radiographic exposure devices and storage containers. [35FR17397]

(k) Steps that must be taken immediately by radiography personnel in the event a pocket dosimeter is found to be off-scale. [44FR50805]

(l) The procedure(s) for identifying and reporting defects and noncompliance, as required by Part 21 of this chapter. [42FR28891]

§ 34.33 Personnel monitoring. [55 FR 843]

(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. [53FR19240]

(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. [44 FR 50805]

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

(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. [53FR19240]

(f) Each alarm ratemeter must— [55 FR 843]

(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

(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. [55FR843]

Precautionary Procedures in Radiographic Operations

§ 34.41 Security.

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 § 20.203(c)(2) of this chapter, or (b) where the high radiation area is locked to protect against unauthorized or accidental entry.

§ 34.42 Posting.

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

§ 34.43 Radiation surveys. [51 FR 21736]

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 § 34.2, whenever a radiographic exposure device, a 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 § 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) is made and is retained for three years when that storage survey is the last one performed in the work day.

§ 34.44 Supervision of radiographers' assistants. [44 FR 50805]

Whenever a radiographer's assistant uses radiographic exposure devices, uses sealed sources or related source handling tools, or conducts radiation surveys required by § 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

§ 34.51 Applications for exemptions.

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.

Appendix A

[30 FR 8185]

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: [55FR843]
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. [30 FR 8185]

IV. Inspection and Maintenance Performed by the Radiographers

V. Case Histories of Radiography Accidents

[Note removed 49 FR 19623]

LIST OF RECENTLY ISSUED NMSS INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
91-44	Improper Control of Chemicals in Nuclear Fuel Fabrication	07/07/91	All nuclear fuel facilities.
91-39	Compliance with 10 CFR Part 21, "Reporting of Defects and Noncompliance"	06/17/91	All Nuclear Regulatory Commission (NRC) material licensees.
91-35	Labeling Requirements for Transporting Multi-Hazard Radioactive Materials	06/07/91	All U.S. Nuclear Regulatory Commission (NRC) licensees.
91-30	Inadequate Calibration of Thermoluminescent Dosimeters Utilized to Monitor Extremity Dose at Uranium Processing and Fabrication Facilities	04/23/91	All fuel cycle licensees routinely handling unshielded uranium materials.
91-26	Potential Nonconservative Errors in the Working Format Hansen-Roach Cross-Section Set Provided with The Keno and Scale Codes	04/02/91	All fuel cycle licensees and other licensees, including all holders of operating licenses for nuclear power reactors, who use physics codes to support criticality safety in the use of fissile material.
91-23	Accidental Radiation Overexposures to Personnel due to Industrial Radiography Accessory Equipment Malfunctions	03/26/91	All Nuclear Regulatory Commission (NRC) licensees authorized to use sealed sources for industrial radiography.
91-16	Unmonitored Release Pathways from Slightly Contaminated Recycle and Recirculation Water Systems At A Fuel Facility	03/06/91	All fuel cycle facilities.
91-14	Recent Safety-Related Incidents at Large Irradiators	03/05/91	All Nuclear Regulatory Commission (NRC) licensees authorized to possess and use sealed sources at large irradiators.

LIST OF RECENTLY ISSUED NRC INFORMATION NOTICES

Information Notice No.	Subject	Date of Issuance	Issued to
91-48	False Certificates of Conformance Provided by Westinghouse Electric Supply Company for Refurbished Commercial-Grade Circuit Breakers	08/09/91	All holders of OLs or CPs for nuclear power reactors.
91-47	Failure of Thermo-Lag Fire Barrier Material to Pass Fire Endurance Test	08/06/91	All holders of OLs or CPs for nuclear power reactors.
89-56, Supp. 2	Questionable Certification of Material Supplied to the Defense Department by Nuclear Suppliers	07/19/91	All holders of OLs or CPs for nuclear power reactors.
91-46	Degradation of Emergency Diesel Generator Fuel Oil Delivery Systems	07/18/91	All holders of OLs or CPs for nuclear power reactors.
91-45	Possible Malfunction of Westinghouse ARD, BFD, and NBFD Relays, and A200 DC and DPC 250 Magnetic Contactors	07/05/91	All holders of OLs or CPs for nuclear power reactors.
91-44	Improper Control of Chemicals in Nuclear Fuel Fabrication	07/08/91	All nuclear fuel facilities.
91-43	Recent Incidents Involving Rapid Increases in Primary-to-Secondary Leak Rate	07/05/91	All holders of OLs or CPs for pressurized-water reactors (PWRs).
91-42	Plant Outage Events Involving Poor Coordination Between Operations and Maintenance Personnel During Valve Testing and Manipulations	06/27/91	All holders of OLs or CPs for nuclear power reactors.

OL = Operating License
CP = Construction Permit

Radiography involves relatively large quantities of radioactive material that can be dangerous if not properly controlled. Performing radiography requires constant attention to detail and vigilant care because of its repetitive nature, frequently in difficult field conditions. Through strong internal radiation safety programs, including management audits, you can ensure that licensed material is being used in a safe manner.

No written response is required by this information notice. If you have any questions about this matter, please contact the appropriate regional office or this office.

Richard E. Cunningham, Director
Division of Industrial and
Medical Nuclear Safety
Office of Nuclear Material Safety
and Safeguards

Technical Contact: Scott W. Moore, NMSS
301-492-0514

Attachments:
1. 10 CFR Part 34
2. List of Recently Issued NMSS Information Notices
3. List of Recently Issued NRC Information Notices

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FC	IMOB*	IMOB*	IMAB*	IMOB	IMNS	OE	IMNS
AME	SMoore/sm/11	CJones	JGlenn	JHickey	JGreeves	JLieberman	RCunningham
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Radiography involves relatively large quantities of radioactive material that can be dangerous if not properly controlled. Performing radiography requires constant attention to detail and vigilant care because of its repetitive nature, frequently in difficult field conditions. Through strong internal radiation safety programs, including management audits, you can ensure that licensed material is being used in a safe manner.

No specific action or written response is required by this information notice. If you have any questions about this matter, please contact the technical contact listed below or the appropriate regional office.

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take appropriate, strong enforcement action to prevent continued degradations in safety. To ensure that your radiography sources are used safely, we recommend that management conduct audits of your field radiography programs, in addition to the audits already required by 10 CFR 34.11(d). Licensee management should also meet with licensee radiographers to discuss management expectations and NRC's heightened concern regarding the safe use of these sources.

Radiography involves relatively large quantities of radioactive material that can be dangerous if not properly controlled. Performing radiography requires constant attention to detail and vigilant care, because of its repetitive nature, frequently in difficult field conditions. Through strong internal radiation safety programs, including management audits, you can ensure that licensed material is being used in a safe manner.

No written response is required by this information notice. If you have any questions about this matter, please contact the appropriate regional office or this office.

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Although radiography is not complex, it does use relatively large quantities of radioactive material that can be dangerous if not properly controlled. Performing radiography requires constant attention to detail and vigilant care, because of its repetitive nature. Through strong internal radiation safety programs, including management audits, you can ensure that licensed material is being used in a safe manner in a field environment.

No written response is required by this information notice. If you have any questions about this matter, please contact the appropriate regional office or this office.

Richard E. Cunningham, Director
Division of Industrial and
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