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NUCLEAR REGULATORY COMMISSION
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MEMORANDUM FOR: Mary Thomas
Office of Nuclear Regulatory Research

FROM: Michael T. Lesar, Chief
Rules Review Section
Rules Review and Directives Branch
Division of Freedom of Information
and Publications Services
Office of Administration

SUBJECT: REVIEW OF DRAFT PROPOSED RULE ON LICENSES FOR
RADIOGRAPHY AND RADIATION SAFETY REQUIREMENTS
FOR RADIOGRAPHIC OPERATIONS

The Rules Review Section has reviewed the draft proposed rule that would amend 10 CFR Part 34. We have attached a marked copy of the package that presents a number of editorial comments and format corrections.

In order to assist you in preparing the list of documents centrally relevant to this proposed rule that is required by NRC's regulatory history procedures, you should place the designator "AE07-1" in the upper right-hand corner of each document concerning the rule that you forward to the Nuclear Documents System.

When the document is forwarded for publication, please include a 3.5 inch diskette that contains a copy of the document in WordPerfect 5.0 and 5.1 as part of the transmittal package. The diskette will be forwarded to the OFR and the Government Printing Office for their use in typesetting the document.

If you have any questions concerning this matter, please contact Alice Katoski (27928) or me (27758).

Michael T. Lesar
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Office of Administration

Attachment: As stated

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set justification
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ACCESSION #: 9109170343

1. Part 34 is revised to read as follows:

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

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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).

Subpart A -- General Provisions

In WP, AIF-21 creates the section symbol

§) 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~~^{the} sealed sources in industrial radiography. ~~(This rule is not to be applied~~^{apply} to medical uses of byproduct material). ~~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.~~ ^{does} (This rule is not to be applied to medical uses of byproduct material). 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.

§) Section 34.3 Definitions.

As used in this part: *stat*

"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.

"Associated Equipment" ^{means} equipment used in conjunction with a radiographic exposure device to make radiographic exposures that drives, guides or comes in contact with the source, (i.e., guide tube, control tube, crank, removable source stop, "J" tube).

"Becquerel" (Bq) ^{means} one disintegration per second.

"Control (crank-out) device" ^{means} the control cable, the protective sheath, and control drive mechanism used to move the sealed source from its shielded position in the radiographic device or camera to an unshielded position outside the device for the purpose of making a radiographic exposure.

"Control tube" ^{means} 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 of practical application of the principles learned in the classroom that should include 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.

"Periodic training" ^{means} a periodic 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.

"Permanent radiographic installation" ^{means} an enclosed shielded room, cell, or vault 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 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 §34.41.

"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 ^{on} 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. (6)

"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, (i.e., a camera or a projector). (6)

"Radiography" ^{means} the examination of the structure of materials by nondestructive methods, utilizing sealed sources of byproduct materials. (6)

"Sealed source" ^{means} any byproduct material that is encased in a capsule designed to prevent leakage or escape of the byproduct material. (6)

"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.) (6)

"Sievert" ^{means} the SI unit of any of the quantities expressed as dose equivalent. The dose equivalent in rems is equal to the absorbed dose in rads multiplied by the quality factor (1 Sv = 100 rems). (6)

that attaches the source to the control table
"Source assembly" *means* consists of the sealed source and a connector. *The source assembly* May also include a stop ball used to secure the source in the shielded position. ~~The connector attaches to the control cable.~~

means
"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.

means
"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.

means
"Storage container" *means* a device in which sealed sources are stored.

means
"Temporary jobsite" *means* a place where licensed materials are present for the purpose of performing radiography other than any permanent radiographic installation.

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

§ ~~Section~~ 34.7 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 ³¹⁵⁰⁻⁰⁰²³ XXXX-XXXX.

(b) The approved information collection requirements contained in this part appear in ~~Section~~ ^{§§} 34.13, 34.25, 34.27, 34.29, 34.31, 34.33, 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, and 34.85.

(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~~ [§] 34.11, Form NRC-313 is approved under control number ³¹⁵⁰⁻⁰¹²⁷ XXXX-XXXX.

(2) *Reserved.*

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 34.13~~ 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 radiographer^s assistants and submit to the Commission a description of this program which specifies the --

(1) Initial and periodic training;

(2) On-the-job training;

(3) Means the applicant will use to demonstrate the radiographer'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; and

(4) Means the applicant will use to determine the radiographer's assistant's knowledge and understanding of and ability to comply with the

applicant's operating and emergency procedures.

(c) In lieu of describing its initial training program for radiographers in the subjects outlined in ~~§34.43(f) of this part,~~^e and the description of and the means to determine the radiographer's knowledge and understanding of these subjects, the applicant ^{may} affirm 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 ~~§34.43(a)(1).~~^e (This paragraph does not affect the licensee's responsibility to ^{en} assure that radiographers are properly trained in accordance with ~~§34.43(a).~~^e)

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

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

*Done
to § 34.43(d)*

spread of contamination, and means of obtaining professional assistance, if needed.

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

(i) The applicant shall submit to the Commission a list and description of permanent radiographic installations and permanent use and storage locations. A storage or use location is considered permanent if radioactive material is in use or storage for more than 180 days in a calendar year.

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,

*Library, 7920 Northpark Avenue,
Bethesda, Maryland 20814.*

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 8201,~~ Washington, DC 20408.

↳ 800 North Capitol Street, NW

(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 the 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 in Type B transport containers must meet the applicable requirements of 10 CFR Part 71, including documentation of the QA program requirements outlined in §71.105.

(3) Modification of any 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~~ ^{may} 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 ^{en} 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, ^{5/1} must comply with the requirements of this section.

(e) All radiographic exposure devices, source assemblies, and associated equipment in use after January 10, 1996 ⁷ must comply with the requirements of this section.

(f) All associated equipment acquired after January 10, 1996 ⁷ must be labelled 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.

(a) Radiographic exposure devices measuring less than 10 centimeters (4 inches) from the sealed source storage position to any exterior surface of the device shall ^{may not} have _a no 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, shall ^{may not} have _a no radiation level in excess of 2 millisieverts (200 millirems) per hour at any exterior surface, and 0.1 millisieverts (10 millirems) 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 §34.20^(s)
and §34.21 applies only to storage containers.

7 Section

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

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

(1) 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, (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 shall be manually secured in the shielded position each time the source is returned to that position, in those exposure devices manufactured prior to January 10, 1992. ^(must)

(2) Each sealed source storage container and source changer shall have a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position. Storage containers and source changers shall be kept locked when containing sealed sources except when under the direct surveillance of a radiographer or a radiographer's assistant. ^(must)

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

§) ~~Section 34.25 Radiation survey instruments.~~

(a) The licensee shall keep sufficient calibrated and operable radiation survey instruments at each field station and temporary jobsite to make the radiation surveys required by this part and by Part 20 of this chapter. Instrumentation required by this section shall ^{must be capable of measuring} have a range such that 0.02 millisieverts (2 millirems) per hour through 0.01 Sievert (1 rem) per hour ^{from} can be measured. Survey instruments shall ^{must} be checked for operability prior to use. 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 1/3 and 2/3 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 appropriate points; and

(3) So that an accuracy within plus or minus 20 percent of the calibration standard can be demonstrated on each scale.

(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 sealed source shall be performed only by persons specifically authorized by the Commission or an Agreement State to do so. *may* ²⁰

(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 test has been made within the 6 months before the transfer, the sealed source may not be used until tested. *e. m. This is a legal document.*

(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 microcuries) of radioactive material on the test sample and must be performed by a person approved 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 microcuries) or more of removable radioactive material ~~shall~~^{must} 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~~^{must} 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 ~~the~~ report ~~shall~~^{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."

§ ~~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.

§ ~~Section 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 prior to 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 and prior to the first use thereafter to ensure the proper functioning of components important to safety. Records of these inspection 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) Each exposure device using DU shielding and an "S" tube configuration shall be periodically tested for depleted uranium contamination. This test ~~could~~^{may} be performed by the licensee using available test kits or the exposure device ~~could~~^{may} be returned to the manufacturer for such testing. This test shall be ~~undertaken~~^{must} 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 proper disposal in accordance with 10 CFR part 61 must be made.

5
Section 34.33 Permanent radiographic installations.

(a) Permanent radiographic installations ~~shall~~^{must} have high radiation area entrance controls of the types described in §20.1601(a)(2), (a)(3), or (b) of this chapter and ~~shall~~^{must} also meet the following special requirements.

(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~~^{must} have both visible and audible warning signals to warn of the presence of radiation. The visible signal ~~shall~~^{must} be actuated by radiation whenever the source is exposed. The audible signal ~~shall~~^{must} be actuated when an attempt is made to enter the installation while the source is exposed.

(c) The alarm system must be tested for proper operation at intervals not to exceed 3 months and the beginning of each day of equipment use. The daily test ~~shall~~^{must} include a check of the visible and audible signals by a crank out of the exposure device prior to use of the room. If a control device or alarm is operating improperly, it ~~shall~~^{must} be immediately labeled as defective and repaired before industrial radiographic operations are resumed. Test records ~~shall~~^{must} be maintained in accordance with §34.75.

5
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, labeled, marked, and accompanied with appropriate shipping papers in accordance with regulations set out in 10 CFR Part 71, including documentation of the QA program requirements outlined in §71.105.

(b) Security precautions during storage and transportation.

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

(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 Radiation Safety Officer.

The Radiation Safety Officer 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} ~~shall~~ include:

- (1) ¹ completion of the training and testing requirements of §34.43(a); and
- (2) ^{Two} 2 years of documented experience in industrial radiographic operations, with at least 40 hours of formal classroom training with respect to the oversight of radiation protection programs.

(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, 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) ¹to 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~~ 34.43 Training.

(a) The licensee ^{may} shall not permit any individual to act as a radiographer until ^{the} ~~such~~ individual: --

- (1) Has been instructed in the subjects outlined in §34.43(f) of this part;
- (2) Has received copies of and instruction in NRC regulations contained in this part; in §30.7, 30.9, and 30.10; and in the applicable sections of Parts 19, 20, and 71 of this chapter, in 49 CFR Part 173, in the 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

(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 in §34.43(f); --

(b) The licensee ^{may} shall not permit any individual to act as a radiographer's assistant until ^{the} ~~such~~ individual: --

- (1) Has received copies of and instruction in NRC regulations contained in this part; in §30.7, 30.9, and 30.10; and in the applicable sections of Parts 19, 20 and 71 of this chapter, in 49 CFR Part 173, in the NRC license(s) under which

the radiographer 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) by successfully completing a written or oral test and a field examination on the subjects covered in §34.43(f).

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

(d) The licensee shall conduct a semi-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 6 months; and

(2) Provide that, if a radiographer or a radiographer's assistant has not participated in a radiographic operation for more than 3 months since the last inspection, that individual's performance must be observed and recorded the next time the individual participates in a radiographic operation.

(e) The licensee shall maintain records of the above training to include written, oral and field examinations, periodic training, and semi-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.

~~Section~~ ^{34.45} Operating and emergency procedures.

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

- (1) The handling and use of licensed sealed sources and radiographic

exposure devices to be employed ^{so} 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 Part 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;
- (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) Form of records.

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

Section 34.47 Personnel monitoring.

(a) The licensee ^{may} ~~shall~~ ^{no} 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} ~~shall~~ have a range from zero to 2 millisieverts (200 millirems) and ^{must} ~~shall~~ be recharged at the start of each shift. In cases where the exposure will be greater than 2 millisieverts (200 millirems) an exemption ^{must} ~~must~~ be applied for to use a pocket dosimeter with a higher endpoint. Each film badge and TLD ^{must} ~~shall~~ be assigned to and worn by only one individual. Film badges and TLDs ^{must} ~~must~~ be replaced at least monthly. After replacement, each film badge or TLD ^{must} ~~must~~ be promptly processed.

(b) Pocket dosimeters ^{must} ~~must~~ be read and the exposures recorded at the beginning and end of each shift, and records ^{must} ~~shall~~ be maintained in accordance with §34.83.

(c) Pocket dosimeters ^{must} ~~shall~~ be checked at periods not to exceed 12 months for correct response to radiation, and records ^{must} ~~shall~~ be maintained in accordance with §34.83. Acceptable dosimeters ^{must} ~~shall~~ 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} ~~his~~ film

badge or TLD ^{must} shall be immediately sent for processing. In addition, the individual shall not work with licensed material until a determination of ^{The individual's} his radiation exposure has been made. This determination ^{must} shall be made by the RSO or ~~his/her~~ 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.

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

(4) 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.

³
Section 34.49 Radiation surveys.

The licensee shall:

(a) Maintain at least one calibrated and operable radiation survey instrument that meets the requirements of §34.25 at each location of its radiographic operations whenever radiographic operations are being performed, including a source exchange, and at the storage area, (as defined in §34.3), whenever a radiographic exposure device, a storage container, or source is being placed in storage.

(b) Conduct a survey of the camera 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 as you approach the guide tube prior to exchanging films, repositioning the collimator, or dismantling equipment.

(d) Conduct a 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 determine that the sealed source is in its shielded position.

(e) For recordkeeping requirements see §34.85.

⁵
Section 34.51 Security.

During each radiographic operation the radiographer or radiographer's assistant shall maintain a 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 (a) where the high radiation area is equipped with a control device or an alarm system as described in §20.1601(a)(1), (a)(2), or (a)(3) of this chapter, or (b) where the high radiation area is locked to protect against unauthorized or accidental entry.

⁵
Section 34.53 Posting.

Notwithstanding any provisions in §20.1903 of this chapter, areas in which radiography is being performed shall be conspicuously posted as required by §20.1902(a) and (b) of this chapter.

⁵
Section 34.55 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 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.

~~Section~~ 34.57 Temporary jobsite.

Whenever radiography will be performed at a temporary jobsite, the radiographer must be accompanied by another qualified radiographer or a radiographer's assistant, who is observing the operations and is capable of providing immediate assistance to prevent unauthorized entry. Radiography may not be performed if only one qualified individual is present at the temporary jobsite.

Subpart E -- Records

3 *Records of*
Section 34.61 ~~Specific~~ license for radiography.

Each licensee shall maintain a copy of ^{its} ~~their~~ license that meets the requirements of §34.13 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.

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

(c) The licensee shall retain the records required by paragraph (a) of this section for 3 years after the record is made.

Section 34.65 Records of radiation survey instruments.

(a) Each licensee shall maintain records of the calibrations of ^{its} ~~their~~ radiation survey instruments.

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

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

(a) Each licensee shall maintain records of leak test results in units of Becquerels (curies).

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

⁵
~~Section~~ 34.69 Records of quarterly inventory.

(a) Each licensee shall maintain records of the quarterly inventory.

(b) The record ^{must} ~~shall~~ 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.

(c) The licensee shall retain the records required by paragraph (a) of this section for 3 years after the record is made.

⁵
~~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;

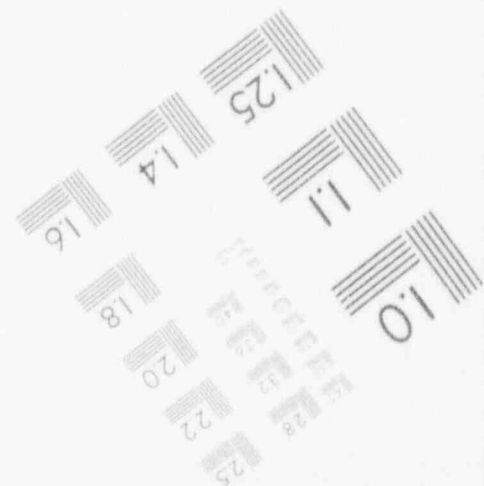
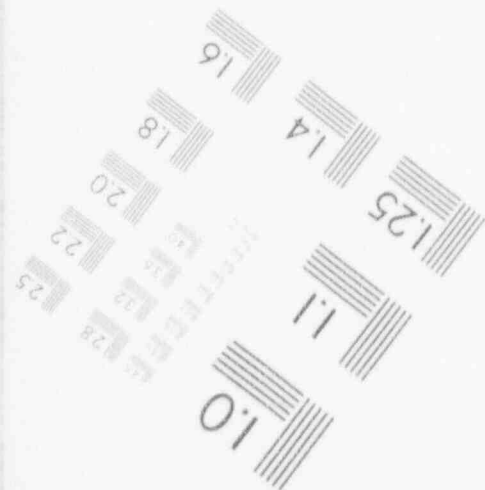
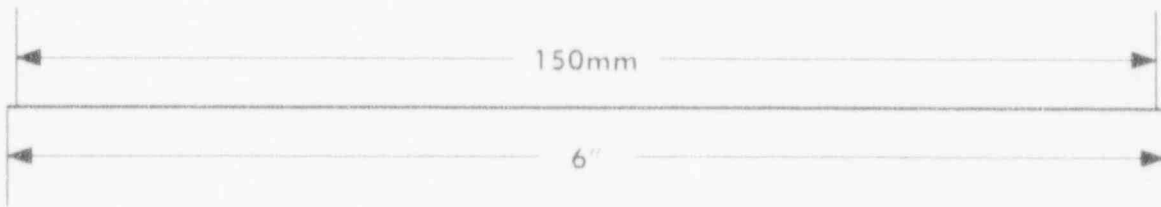
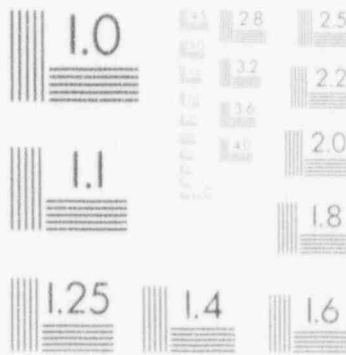
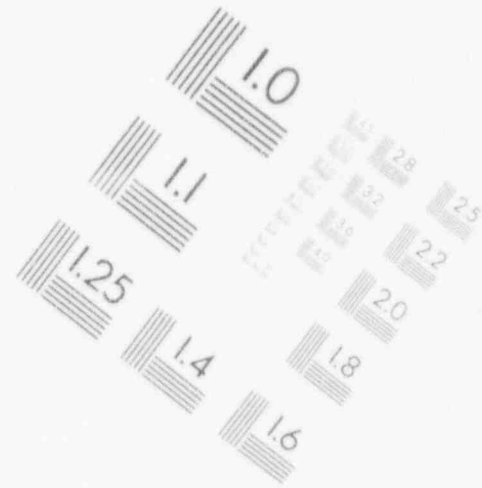
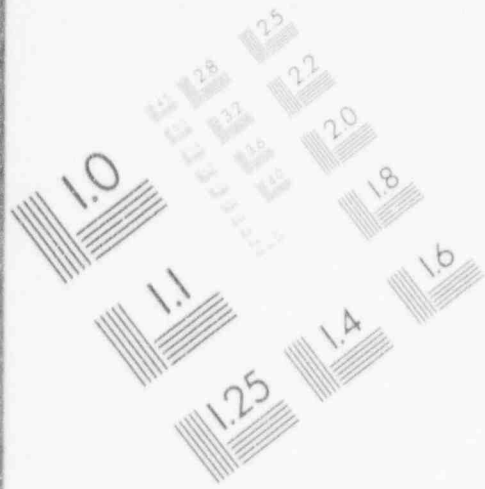
(2) The identity and signature of the radiographer to whom assigned; and

(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.

2

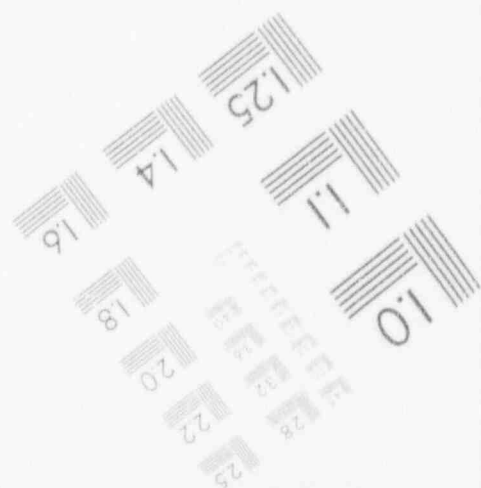
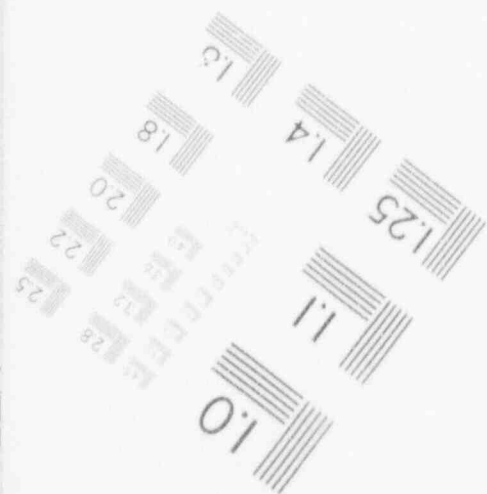
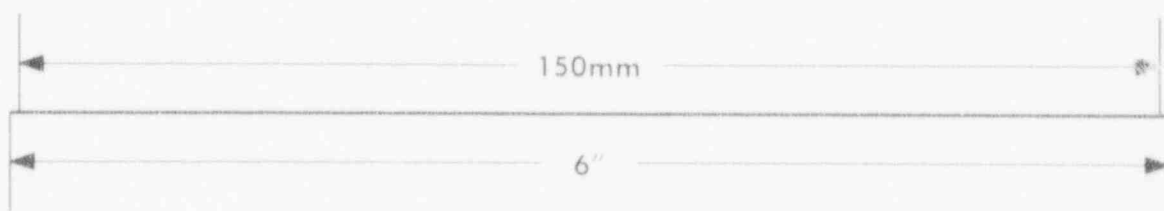
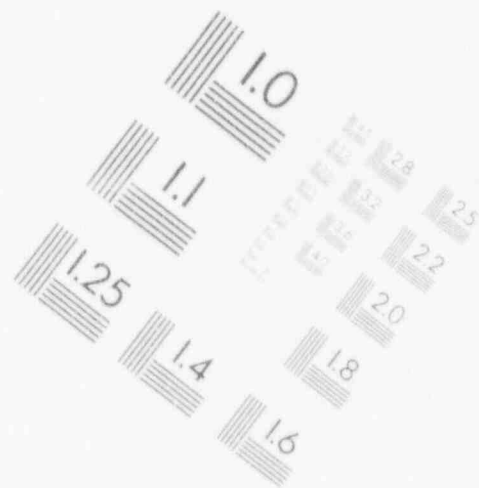
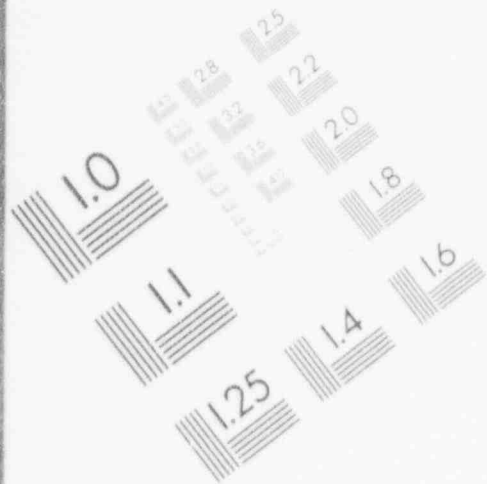
IMAGE EVALUATION TEST TARGET (MT-3)



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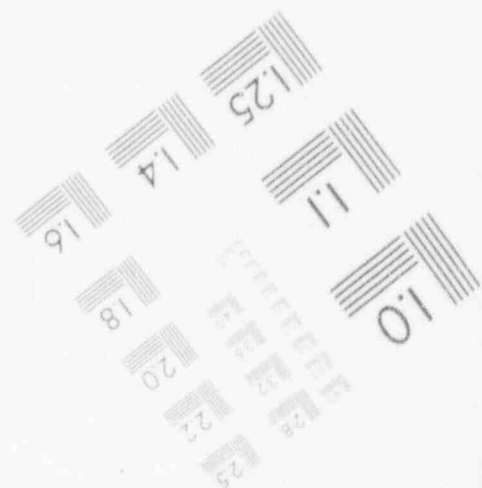
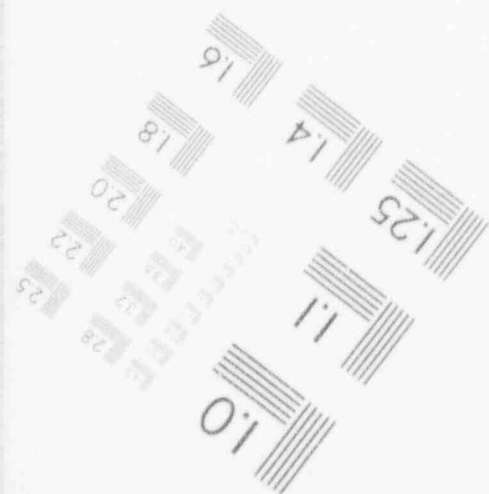
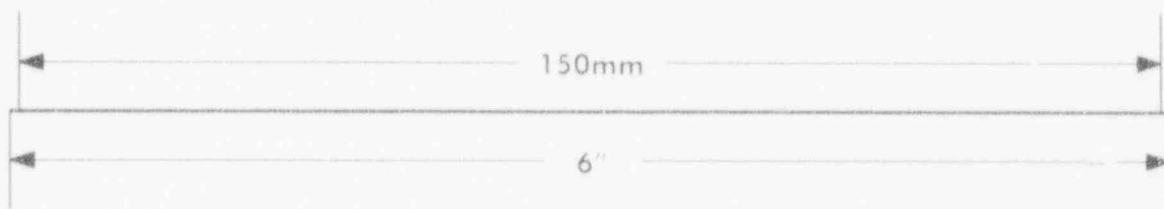
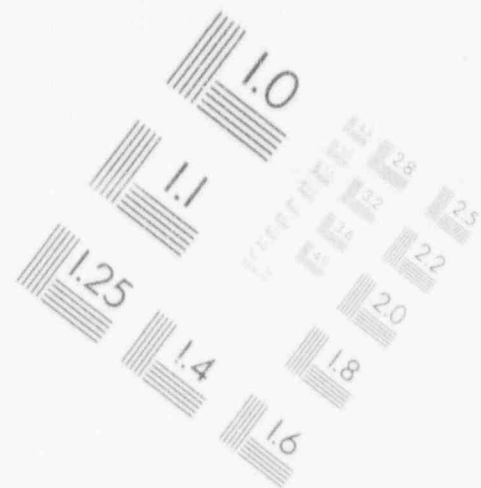
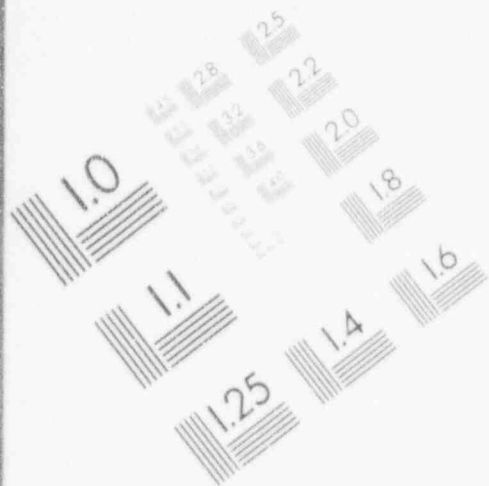
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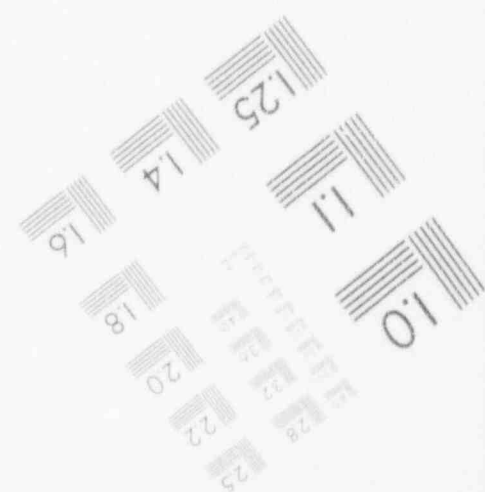
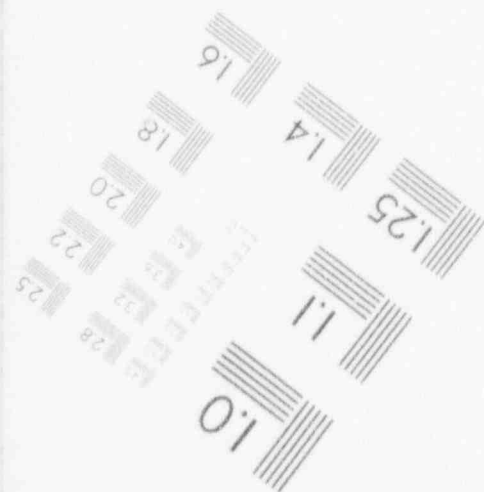
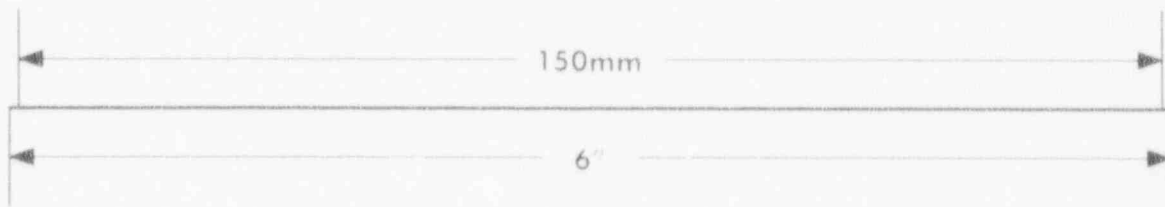
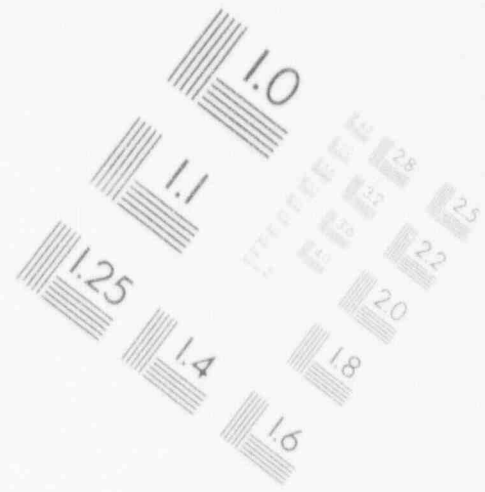
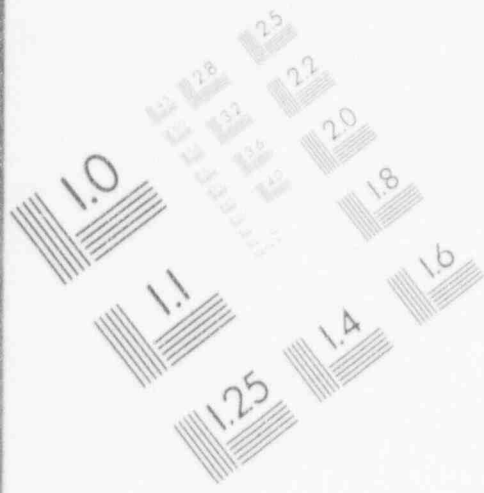
IMAGE EVALUATION TEST TARGET (MT-3)



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IMAGE EVALUATION TEST TARGET (MT-3)



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⁵
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 inspection and maintenance of radiographic exposure devices, storage containers, associated equipment, and source changers.

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

(c) The licensee shall retain the records required by paragraph (a) of this section for 3 years after the record is made.

⁵
Section 34.75 Records of permanent radiographic installations.

(a) Each licensee shall maintain records of alarm system tests.

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

⁵
Section 34.79 Records of training.

(a) Each licensee shall maintain records of training of each radiographer and each radiographer's assistant, to include copies of written tests, dates of oral tests, and field examinations.

(b) Each licensee shall maintain records of periodic training for each radiographer and each radiographer's assistant. The records must list the topics discussed, the dates of the reviews, and the attendees.

(c) The licensee shall retain the records required by paragraphs (a) and (b) of this section for 3 years after the record is made.

⁵
Section 34.81 Copies of operating and emergency procedures.

(a) Each licensee shall maintain a copy of current operating and emergency procedures.

(b) The licensee shall retain the records until the Commission terminates the license.

(c) If procedures are superseded, the licensee shall retain the superseded material for 3 years after each change.

⁵
~~Section~~ 34.83 Records of personnel monitoring.

(a) Each licensee shall maintain records of daily exposures recorded from pocket dosimeter readings and yearly operability checks.

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

(c) Each licensee shall maintain records of reports received from the film badge or TLD processor.

(d) The licensee shall retain the records required by paragraph (c) until the Commission terminates the license.

⁵
~~Section~~ 34.85 Records of radiation surveys.

(a) Each licensee shall maintain records of exposure device surveys when it is the last one performed in the work day and prior to placing the device in storage.

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

⁵
~~Section~~ 34.87 Form^s 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.

Each licensee shall maintain copies of the following documents and records at the field station:

- (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) The record of radiation survey instrument calibrations required by §34.65;
- (e) The record of leak test results required by §34.67;
- (f) Physical inventory records required by §34.69;
- (g) Utilization records required by §34.71;
- (h) Records of inspection and maintenance required by §34.73;
- (i) Training records required by §34.79; and

(j) Survey records required by §34.85.

Section 34.91 Documents and records required at temporary jobsites.

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:

- (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) Latest survey records required by §34.85;
- (d) The shipping papers for the transportation of radioactive materials required by §71.5 of this chapter; and
- (e) 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 -- Notification of incidents

Section 34.101 Notification of incidents.

(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; 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; *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 involve failure of safety components of radiography equipment:

(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; *and*

(7) Qualifications of personnel involved in the incident.

Subpart G -- Exemptions

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 -- Enforcement

~~Section~~ 34.121 Violations.

(a) An injunction or other court order may be obtained to prohibit a violation of any provision of this part.

(b) A court order may be obtained for the payment of a civil penalty imposed for violation of this part.

(c) Any person who willfully violates any provision of this part issued under section 161 b., i., or o. of the Atomic Energy Act of 1954, as amended, or the provisions cited in the authority citation at the beginning of this part may be guilty of a crime and, upon conviction, may be punished by fine or imprisonment, or both, as provided by law.

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