



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

AE07-1 021

PDR

APR 28 1993

MEMORANDUM FOR: Brenda J. Shelton, Chief  
Information and Records Management Branch  
Division of Information Support Services  
Office of Information Resources Management

FROM: Mark Au  
Information Management Coordinator  
Office of Nuclear Regulatory Research

SUBJECT: 10 CFR 34, LICENSES FOR RADIOGRAPHY AND  
RADIATION SAFETY REQUIREMENTS FOR  
RADIOGRAPHIC OPERATIONS, PROPOSED RULE

We have reviewed your comments on the proposed rule and OMB Supporting Statement. Changes have been made accordingly. Specific responses to your comments are provided as follows:

Response to the comments:

The numbering for section 34.7, "Information Collection Requirements: OMB Approval" has been changed back to 34.8.

Regarding the comment on § 34.13(g), "permanent radiographic installations," the paragraph has been redesignated 34.13(i) and reads as follows:

"The applicant shall submit to the Commission a list and description of permanent radiographic installations which are at their place of business and storage locations where radioactive material is stored for more than 180 days in a calendar year."

The comment regarding § 34.23(b) "records surveys of devices as they are moved" was not incorporated. A record of this survey is not necessary. This is simply a precautionary move on the part of the licensee to maintain compliance with ALARA.

The comment regarding § 34.31(c) "testing of "S" tubes" was incorporated into § 34.27(f).

The comment regarding § 34.43(a)(1) referring to § 34.43(h) was correct. There is no § 34.43(h). Paragraph 34.43(a)(1) refers to §34.43(f).

The comment regarding § 34.47(e) "records of lost or damaged film badges or TLDs" was incorporated into both § 34.47(e) and §34.83.

The comment regarding § 34.53 referring to § 20.1903 was not valid. Section 20.1603 was deleted not § 20.1903.

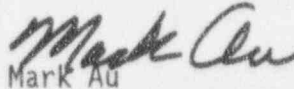
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The comment regarding § 34.81 was incorporated into § 34.81.

The comment regarding reformatting of the recordkeeping requirements subpart E has been incorporated.

The comment regarding § 34.83(f) was not clear. There is no § 34.83(f).

The other comments that were made throughout the text were also addressed. Attached is the draft OMB Supporting Statement and the latest version of the proposed rule in a side-by-side format to make it easier to see the changes. The package only addresses those new requirements in the proposed rule for which an OMB clearance has not been obtained.



Mark Au

Information Management Coordinator  
Office of Nuclear Regulatory Research

Attachments:

1. OMB Supporting Statement
2. Side-by-Side Format

cc: MLThomas, RES  
MLesar, ADM

OMB SUPPORTING STATEMENT FOR 10 CFR PART 34  
LICENSES FOR RADIOGRAPHY AND RADIATION SAFETY REQUIREMENTS  
FOR RADIOGRAPHIC OPERATIONS

(3150-XXXX)  
0007

Description of the Information Collection

~~General requirements for radiation protection which are applicable to all NRC licensees are contained in 10 CFR Part 34, "Licenses for Radiography and Radiation Safety Requirements for Radiographic Operations."~~

~~This clearance package covers the requirements for all sections of 10 CFR Part 34.~~

~~The recordkeeping and reporting requirements for sections 34.1 through 34.121 are imbedded throughout these sections.~~

*This should be rewritten to indicate that this 10 CFR Part covers  
(see ~~10 CFR Part 34.1~~) indicate this is a complete revision  
of Part 34 and why it is being done.*

*(First paragraph of existing Pt 34 extension could be used.)*

Each new or modified requirement should be justified in the section describing the requirement

A. JUSTIFICATION

The purpose of this revision is to clarify and update the NRC's requirements for radiography.

1. Need for the Collection of Information

The information collection requirements of the revised 10 CFR Part 34 are identified below.

§34.11 Application for a specific license, and §34.13 Specific license for radiography.

*(currently at §34.3 and 34.11)*

Taken together, these two sections require a license applicant to submit an application on NRC Form 313. The purpose of the application is to permit the NRC to determine whether the applicant's equipment, procedures, and personnel are adequate to protect public health and safety. As part of the application there is a new requirement in §34.13(g) to designate a Radiation Safety Officer.

*There appear also to be several modified or added reqs, i.e., 34.13 (b)(3) addition, 34.13 (d) modification, 34.13 (f) mod. Add need for changes not new was 34.11 (c)*

§34.15 Request for written statements.

*34.11 (c)*

*reflects a new requirement for*

This section requires licensees to submit, upon request, any additional information that NRC may need to determine whether or not the license should be modified, suspended, or revoked. The purpose of this section is to allow the NRC to obtain additional information if there is a question about whether public health and safety are being adequately protected.

*now longer to clarify the request. - use for minor word changes*

§34.20 Performance requirements for radiography equipment.

Paragraph (b)(1) of this section requires that each radiographic exposure device have an attached label bearing information identifying the radionuclide in the device, its activity, the manufacturer and model number, and the licensee's name, address, and telephone number. This information will serve as a safety notice to users and members of the public. The label requirement has been incorporated in the regulations, in part, in conformance with ANSI Standard N432. Paragraph (c)(4) requires that each sealed source or source assembly have an attached label bearing the words: "DANGER -- RADIOACTIVE" <sup>to alert the user to its danger.</sup> *There are no changes in requirements for these subsections.*

*§34.23 requires a survey. do a record made for the survey? If so, include.*  
§34.25 Radiation survey instruments and §34.65 Records of radiation survey instruments.

*. Not an info. collection*  
~~Paragraph (a) of §34.25 requires the licensee maintain sufficient calibrated and operational radiation survey instruments to make physical radiation surveys as required by 10 CFR Parts 34 and 20. Paragraphs (b) <sup>and (c)</sup> of §34.25 requires that each radiation survey instrument be calibrated at intervals not to exceed 6 months and after each instrument servicing, and that a record shall be maintained in accordance with §34.65.~~ *The calibration interval is being reduced from 3 mos to 6 mos. Add why.*  
The making of radiation surveys is one of the most important aspects of radiation safety and the instruments must provide reasonable accuracy in the measurement of the levels of radiation to which individuals are exposed during conduct of radiographic operations. The records allow NRC inspectors to verify that required calibrations have been performed. The licensee will use the records to assure itself that the instruments available to radiographers and radiographer's assistants are properly calibrated.

§34.27 Leak testing, repair, tagging, opening, modification, and replacement of sealed sources; and §34.67 Records of leak testing, repair, tagging, opening, modification, and replacement of sealed sources.

Paragraph (b) of §34.27 requires the licensee to maintain records of leak test results in accordance with §34.67. A leak test is the only effective method of determining the integrity of the sealed source. Serious radiological hazards could result from a leaking source. The records allow NRC inspectors to verify that required tests to detect radioactive contamination have been done. Paragraph (d) of §34.27 requires that licensees report within 5 days of the leak testing any result which would indicate that a source is leaking. The report must describe the equipment involved, the test results, and the corrective action taken. The NRC staff uses the report in assessing whether the corrective actions initiated by the licensee are adequate to protect workers and the public from the hazards of a leaking source. The NRC staff also uses the report to identify generic problems with respect to source design, radiographic equipment design,

or problems in source manufacturing and quality control. *OK. Add labeling requirements at (e). Indicate there are no changes in these info requirements which are at 34.25 in the current regulation. Where are requirements at 34.67? Address deletion of current 34.27 - What are the requirements?*  
§34.29 Quarterly inventory and §34.69 Records of quarterly inventories.

Paragraph ~~34.29~~<sup>29</sup> of §34.29 requires the licensee to conduct a quarterly physical inventory to account for all sealed sources received and possessed under the license, and to maintain records of the inventories in accordance with §34.69. The inventories are used by the licensee to verify the location of the sources and to control the type, quantity and use of byproduct material. The records allow NRC inspectors to verify that the required inventories have been conducted

and to ensure that the licensee is in compliance with authorized possession limits. *There is no change in this requirement currently at 34.26.*

*Add requirement of §34.69.*

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

Paragraph (a) of §34.31 requires that the licensee have a program to inspect for obvious defects of radiographic exposure devices, source changers, <sup>associated</sup> auxiliary equipment and storage containers 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, and to remove defective equipment from service until it is repaired, and to make a record of the defect in accordance with §34.73. The records assist the licensee in keeping track of when the equipment was last inspected and maintained and when inspection is next due. The records are used by NRC staff to determine the extent of compliance by the licensee, and to detect problems that may be generic to the equipment so that corrective action might be taken.

*The Add the revisions to the §, namely - also check for auxiliary equipment, ~~that~~ that labels are present and record of defects. Add reason for change.*

NOT  
NEW

*Does ~~§~~ require a record? If so, add. moved to 34.27 back to text*

*Add requirements at 34.73. Spell out the records.*

*The new requirements are to inspect the associated equipment & to ensure that the required labels are present.*

*The record keeping reports ~~of~~*

DRAFT 34.73 is added which reflects in record keeping reports present ~~is~~ in the current rule @ 34. Thursday, February 11, 1993 12:53pm

§34.33 Permanent radiographic installations and §34.75 Records of permanent radiographic installations.

§34.33 requires that the alarms on permanent radiographic installations required by §34.33(b) be tested at intervals not to exceed 3 months and at the beginning of each day of equipment use. *Defective control devices or alarms shall be immediately labeled.* Records of the alarm test shall be maintained in accordance with §34.75. These alarms are an important backup to the radiation survey instrument and are intended to prevent inadvertent entry into a radiographic installation (cell) while a source is in the unshielded position. The records are use by the licensee to keep track of when the tests were last performed and when they are next due. Paragraph (b) of §34.75 requires that the licensee retain these records for a period of 3 years after the record is made, so that they may be reviewed by NRC inspectors to determine compliance with required testing of important safety equipment. *Revised section requires additional tests. Should be indicated with reason.*

§34.35 Labels, storage, and transportation precautions.

This section requires that labels used to identify radioactive material containers use formats and wording which is consistent with 20.1904. This is to minimize the potential for worker confusion by using consistent warning labels.

*And 34.41 - a RSO qualifications to lic. application requirement,*  
§34.43 Training and §34.79 Records of training.

*(currently at 34.31)*  
*(currently at 34.32)*  
Paragraph (e) of §34.43 requires that the licensee maintain records of training to include written, oral and field examinations, annual safety reviews, and annual evaluations of job performance. The licensee shall maintain records of



the aforementioned items in accordance with §34.79. The <sup>newly required</sup> records of the annual evaluations will be used by the licensee to keep track of deficiencies, if noted, so that they can be corrected. Paragraph (c) of §34.79 requires that the licensee retain these records for a period of 3 years after the record is made so that the NRC can inspect to ensure that these individuals are properly trained.

*What about records of annual safety reviews? Aren't these new? Add need for revision. (List of topics & dates of reviews)*

§34.45 Operating and emergency procedures and §34.81 Records of operating and emergency procedures.

*(currently at §34.32)*  
This section requires that licensees develop procedures for routine operations and emergencies for employees to follow in performing safety functions. These include the safe handling and use of sealed sources and radiographic exposure devices; conducting radiation surveys; controlling access to radiographic areas; locking and securing radiographic exposure devices, storage containers, and sealed sources; personnel monitoring; transporting sealed sources; minimizing exposure; accident procedures; source recovery procedures; inspection and maintenance of radiographic exposure devices and storage containers; steps to be taken if a pocket dosimeter is off-scale; and procedures for identifying and reporting defects and noncompliance. The licensee must maintain copies of current operating and emergency procedures in accordance with §34.81. Paragraph (b) of §34.81 requires that the licensee retain these until the Commission terminates the license. Paragraph (c) of §34.81 requires that the licensee retain copies of superseded material for 3 years after each change. The records allow the operators to have access to an up-to-date set of written operating procedures so that they can operate the radiography equipment properly.

DRAFT *Add. items to be included in procedures 34.45 (k)(6), (l) need to be addressed with need. These will show burden for updating procs.*

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§34.47 Personnel monitoring and §34.83 Records of personnel monitoring.

*New requirements  
for exemption requests  
to be added to  
head*

*Personnel monitoring requirements are currently at §34.33*

The NRC has reevaluated these requirements in view of questions raised by OMB in the previous clearance. §34.47(a) requires that radiographers wear several types of devices to monitor their exposure to radiation. One of these devices is a pocket dosimeter, which is important because it tells the radiographers how much radiation dose they have accumulated during their shift. Paragraph (b) of §34.47 requires radiographers to read and record the exposure on the their pocket dosimeters at the beginning and end of each shift, and that records shall be maintained in accordance with §34.83. Paragraph (c) of §34.47 requires that the pocket dosimeters be checked at periods not to exceed 12 months for correct response to radiation, and that records shall be maintained in accordance with §34.83. When the radiographer records the pocket dosimeter reading, the licensee then knows the amount of exposure a worker received during a given shift and the licensee can take needed actions (e.g., adjust the worker's assignments so as to maintain their accumulated dose within regulatory limits; provide training to improve their work habits and thus reduce their dose). Radiographers are also required to wear a film badge or TLD which is used as their permanent record of their occupational exposure.

*Add (f) and (g)(4) - new*

*included in last part of this section*

The records serve as an important mechanism for controlling exposure on a day-to-day basis, provide indications of inadvertent exposure, and provide a backup record of estimated exposure in case a film badge or thermoluminescent dosimeter is lost. Pocket dosimeter readings are often the first indication a radiographer has of an overexposure or improperly stored source. Records of pocket dosimeter readings are needed in investigations of incidents and overexposures.

~~*Requirements are currently at §34.33*~~

The last of the devices used by radiographers is the alarm ratemeter, which is important because it tells the radiographer that they are in an radiation area where the dose is greater than or equal to 500 milliroentgen-hour (mR/hr). This device allows the radiographer to quickly leave the area to minimize their dose.

Paragraph (g) of §34.47 requires that these devices be calibrated at periods not to exceed one year for correct response to radiation. The licensee must maintain records of the calibrations in accordance with §34.83. Paragraph (b) of §34.83 requires that the licensee retain these records for 3 years after the record is made. Paragraph (c) of §34.83 requires that the licensee maintain records of reports received from the film badge or TLD processor. Paragraph (d) of §34.83 requires that the licensee retain these records until the Commission terminates the license. The records allow NRC inspectors to verify that the licensee is complying with the NRC's radiation dose limits and to determine the effectiveness of the licensee's exposure control program.

§34.49 Radiation surveys and §34.85 Records of radiation surveys.

The NRC has reevaluated the requirements of this section in view of questions raised by OMB in the previous clearance. Paragraph (d) of §34.49 requires that radiography licensees maintain records of storage surveys in accordance with §34.85. These storage surveys are required by paragraph (c) of §34.49 when that survey is the last one that is performed on that day. Paragraph (b) of §34.85 requires that the licensee retain these records for 3 years after the record is made. The records allow NRC inspectors to verify that the required radiation surveys have been done and that the radiation dose limits are being complied

with.

The requirement in paragraph (c)<sup>d</sup> of §34.49 is intended to assure that the radioactive source is in the fully shielded position at the end of the work day after the device has been placed in its storage location. A device may remain stored for an extended period and, if the source is not fully shielded, it could cause excessive and unnecessary radiation exposure to unsuspecting individuals.

*This requirement currently exists at §34.43 and is not being revised.*

§34.53 Posting.

This section requires the licensee to conspicuously post areas in which radiography is being performed to serve as a warning to anyone that might enter the area. *This is a current requirement at §34.53.*

§34.61 Records of specific licenses for radiography.

*new*  
This section requires the licensee to have a copy of the license and amendments until superseded or until the NRC terminates the license. The purpose is so that the licensee will review the document regularly to verify that they are in compliance with the conditions of the license and the commitments that it has made.

§34.63 Records of receipt and transfer.

Paragraph (a) of this section requires that the licensee maintain records showing receipts and transfers of sealed sources. Paragraph (c) requires that the

*(b) indicate the information to be kept as a record.*

licensee retain these records for a period of 3 years after the record is made. The records allow NRC inspectors to verify ~~that~~ the sources the licensee is presently using. *not a sentence*

§34.71 Utilization logs.

Paragraph (a) of this section requires that the licensee maintain current utilization logs. Paragraph (b) of this section requires that the licensee retain these records for a period of 3 years after the record is made. These logs must show for each sealed source the following information: (a) 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; (b) the identity and signature of the radiographer to whom assigned; (c) the plant or site where used and dates of use, including the dates removed and returned from storage. The records allow NRC inspectors to determine whether the licensed material has been properly controlled and used. The records are also used by the licensee to maintain control of licensed material.

*There are added requirements at 34.71 (c)(1) - serial #, (c)(2) signature, and (a)(3) dates removed & returned to storage. Added requirements and their need need to be addressed.*

§34.89 Documents and records required at field stations.

§34.89 adds the requirement to maintain copies of the following records

The following documents and records are needed at field stations, to safely perform radiographic operations: Needs a better justification

to demonstrate compliance w/ NRC req. use in conducting rad ops.

No need to double space

- (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.

§34.91 Documents and records required at temporary jobsites.

*§34.91 add the requirement that*

Each licensee conducting operations at a temporary jobsite ~~shall~~ maintain copies of the following documents and records at the temporary jobsite in order to safely perform the radiographic operation 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 §34.77 and §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.

*No need to double space*

34.101 Notifications of incidents.

*adds the requirement*  
This section ~~establishes~~ that each licensee shall submit a written report within 30 days after learning of any of the following occurrences:

- (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.

This report is required so that NRC can ensure that there are appropriate follow-up actions to avoid a recurrence. Paragraph (b) of this section contains requirements for the content of these reports. *List the 7 content requirements and why they are all needed.*

§34.111 Applications for exemptions.

*now*  
This section allows licensees to request exemption from the NRC's requirements. The requests are part of the application process under §34.11 and thus, the burden is covered under that section.

2. Agency Use of Information

The information collected is used to evaluate the effectiveness of NRC regulations and to discern any trends, problems, or special situations requiring

*This should be rewritten to orient around preventing safety issues & guide reactor to safety issues. Only will not buy "read to compare applicants" if you include analysis. Thanks. You need to indicate why this is needed.*

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additional controls. The NRC uses information on worker exposures to analyze trends and compare applicant performance. This information is also published in annual reports for use by industry and other interested organizations.

3. Reduction of Burden through Information Technology

There are no legal obstacles to reducing the burden associated with this information collection. *The revision to 10 CFR Part 34 encourages licensees who so desire to submit info in electronic format* However, ~~because of the types of information and the infrequency of submission, the application form and reports do not lend themselves readily to the use of automated information technology.~~

4. Effort to Identify Duplication

The Information Requirements Control Automated System was searched and no duplication was found.

5. Effort to Use Similar Information

There is no similar information available to the NRC.

6. Effort to Reduce Small Business Burden

Many NRC radiography licensees are small businesses. Efforts have been made to keep the requirements for information to a minimum. However, since the consequences of mishandling of a radiography source are likely to be the same for large and small entities, it is not possible to further reduce the burden on small businesses by less frequent or less complete recordkeeping or reporting.

7. Consequences of Less Frequent Collection

Applications are only required to be submitted for the initial license, for amendments, and for renewal every 5 years. The application process requires that applicants and licensees perform a comprehensive review of their entire radiation safety program to assure that all activities will be or are being conducted safely and in accordance with NRC regulations. The review and submission of the information required for the application is essential to NRC's determination of whether the applicant has training, experience, equipment, facilities and procedures for the use of byproduct material that are adequate to protect the public health and safety. Other reporting and recordkeeping requirements are occasioned by specified events such as leak tests, instrument calibrations, and inventories of licensed material. Conduct of these tests and other events and collection of information concerning them at the required frequency is essential to the assurance of protection for the health and safety of workers and the public.

8. Circumstances Which Justify Variation from OMB Guidelines

§34.27(d) varies from OMB guidelines in requiring that licensees report within 5 days of the leak testing any result which would indicate that a source is leaking. This requirement for a report in less than 30 days is necessary because a leaking source could present a radiological hazard to workers and the public, and NRC must be notified promptly in order to be able to assess whether corrective actions initiated by the licensee are adequate.

§34.45 varies from OMB guidelines in requiring that licensees retain a copy of current operating and emergency procedures as a record until the Commission terminates the license. It is necessary that these procedures be retained longer than 3 years because the information is used by the licensee and its employees throughout the period of licensed activity to guide the handling and use of radioactive material in normal and emergency situations.

*add 34.83(d), 34.61*

9. Consultations Outside the NRC

There have been no consultations outside the agency since the previous clearance of this information collection requirement. *The proposed rule will be published for public comment.*

10. Confidentiality of Information

None, except for proprietary information.

11. Justification for Sensitive Questions

There are no questions regarding sensitive issues.

12. Estimated Annualized Cost to the Federal Government

13. Estimate of Burden

14. Reasons for Change in Burden

15. Publication for Statistical Use

B. COLLECTIONS OF INFORMATION EMPLOYING STATISTICAL METHODS

23 APR 93  
VERSION

CURRENT RULE

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

Sec.

34.1 Purpose and scope.

34.2 Definitions.

34.3 Applications for specific  
licenses.

34.4 Maintenance of records.

34.8 Information collection  
requirements: OMB approval.

Subpart A -- Specific Licensing  
Requirements

See § 34.3.

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

Subpart B -- Radiation Safety  
Requirements

Equipment Control

34.20 Performance requirements for  
radiography equipment.

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

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

PROPOSED RULE

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

Subpart A -- General Provisions

Sec.

34.1 Purpose and scope.

34.3 Definitions.

See § 34.11.

34.5 Interpretations.

See § 34.87.

34.8 Information collection  
requirements: OMB approval.

Subpart B -- Specific Licensing  
Requirements

34.11 Application for a specific  
license.

34.13 Specific license for  
radiography.

Subpart C -- Equipment

34.20 Performance requirements for  
radiography equipment.

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

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

34.23 Storage precautions.  
34.24 Radiation survey instruments.  
34.25 Leak testing, repair, tagging, opening, modification and replacement of sealed sources.  
34.26 Quarterly inventory.  
34.27 Utilization logs.  
34.28 Inspection and maintenance of radiographic exposure devices, storage containers, and source changers.  
34.29 Permanent radiographic installations.  
See § 34.23.

#### Reporting

34.30 Reporting requirements.

#### Personal Radiation Safety Requirements for Radiographers and Radiographers' Assistants

34.31 Training.  
34.32 Operating and emergency procedures.  
34.33 Personnel monitoring.

#### Precautionary Procedures in Radiographic Operations

34.41 Security.  
34.42 Posting.  
34.43 Radiation surveys.

See § 34.35.  
34.25 Radiation survey instruments.  
34.27 Leak testing and replacement of sealed sources.  
34.29 Quarterly inventory.  
See § 34.71.  
34.31 Inspection and maintenance of radiographic exposure devices, storage containers, associated equipment, and source changers.  
34.33 Permanent radiographic installations.  
34.35 Labels, storage, and transportation precautions.

See Subpart F, § 34.101.

#### Subpart D -- Radiation Safety Requirements

34.41 Radiation Safety Officer.  
34.43 Training.  
34.45 Operating and emergency procedures.  
34.47 Personnel monitoring.

See § 34.51.

See § 34.53.

34.49 Radiation surveys.

See § 34.41.

See § 34.42.

34.44 Supervision of radiographers' assistants.

#### Exemptions

34.51 Applications for exemptions.

#### Appendix A

See § 34.24.

See § 34.25(c).

See § 34.26.

See § 34.27.

See § 34.28(b).

See § 34.31(c).

See § 34.32.

See § 34.33(b and e).

34.51 Security.

34.53 Posting.

34.55 Supervision of radiographers' assistants.

34.57 Requirements for radiographic operations conducted outside of a permanent radiographic installation.

See Subpart G, § 34.111.

See § 34.43(f).

#### Subpart E -- Records

34.61 Records of specific license for radiography.

34.63 Records of receipt and transfer of sealed sources.

34.65 Records of radiation survey instruments.

34.67 Records of leak testing and replacement of sealed sources.

34.69 Records of quarterly inventory.

34.71 Utilization logs.

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

34.75 Records of permanent radiographic installations.

34.79 Records of training.

34.81 Records of operating and emergency procedures.

34.83 Records of personnel monitoring.

See § 34.43(d).

See § 34.4.

See § 34.30.

See § 34.51.

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

34.85 Records of radiation surveys.

34.87 Forms of records.

34.89 Documents and records required at field stations.

34.91 Documents and records required at temporary jobsites.

Subpart F -- Notification of incidents

34.101 Notification of incidents.

Subpart G -- Exemptions

34.111 Applications for exemptions.

Subpart H -- Enforcement

34.121 Violations.

34.123 Criminal penalties.

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

### Section 34.1 Purpose and scope.

#### Section 34.1 Purpose and scope.

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

#### Section 34.2 Definitions.

As used in this part:

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 ~~the~~ sealed sources in industrial radiography. This rule does not 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.

#### Section 34.3 Definitions.

As used in this part:

"ALARA" (acronym for as low as reasonably achievable) means making every reasonable effort to maintain exposures to radiation as far below the dose limits specified in Part 20 as is practical and consistent with the purpose for which the licensed activity is undertaken.

"Associated Equipment" means equipment that is used in conjunction with a radiographic exposure device to make radiographic exposures that drive, guide or come in contact with the source, (i.e., guide tube, control tube, crank, removable source stop, "J" tube).

"Becquerel" (Bq) means one disintegration per second.

"Collimator" means a device used to limit the size, shape, and

direction of the primary radiation beam.

"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.

“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,

“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 ensuring 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, (i.e., a camera or a projector).

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

“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.

“Shielded position” means the location within the radiographic exposure device or source changer where the sealed source is secured and restricted from movement. In this position the radiation exposure will be at a minimum. This position incorporates maximum shielding for the radioactive source.

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

“Source assembly” means *in assembly unit* consists of the sealed source and a connector that attaches the source to the control cable. The source assembly may also include a stop ball used to secure the source in the shielded position.

“Source changer” means a device designed and used for replacement of sealed sources in radiographic exposure devices, including those also used for transporting and storage of sealed sources.

“Storage area” means any location, facility, or vehicle which is used to store or to secure a radiographic exposure device, a storage container, or a sealed source when it is not in use and which is locked or has a physical barrier to prevent accidental

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.

exposure, tampering with, or unauthorized removal of the device, container, or source.

“Storage container” means a device in which sealed sources are stored.

“Temporary jobsite” means a place where 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.

See § 34.11.

#### Section 34.3 Applications for specific licenses.

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

See § 34.87.

#### Section 34.4 Maintenance of records.

Each record required by this part must be legible throughout the retention period specified by each Commission regulation. The record may be the original of a reproduced copy of a microform provided that

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

Section 34.8 Information collection requirements: OMB approval.

(a) The Nuclear Regulatory Commission has submitted the information collection requirements contained in this part to the Office of Management and Budget (OMB) for approval as required by the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). OMB has approved the information collection requirements contained in this part under control number 3150-0007.

(b) The approved information collection requirements contained in this part appear in Section 34.11, 34.24, 34.25, 34.26, 34.27, 34.28, 34.29, 34.31, 34.32, 34.33, and 34.43.

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

Section 34.8 Information collection requirements: OMB approval.

(a) The Nuclear Regulatory Commission has submitted the information collection requirements contained in this part to the Office of Management and Budget (OMB) for approval as required by the Paperwork Reduction Act of 1980 (44 U.S.C. 3501 et seq.). OMB has approved the information collection requirements contained in this part under control number 3150-0023.

(b) The approved information collection requirements contained in this part appear in §§ 34.13, 34.20, 34.25, 34.27, 34.29, 34.31, 34.33, 34.43, 34.45, 34.47, 34.49, 34.61, 34.63, 34.65, 34.67, 34.69, 34.71, 34.73, 34.75, 34.79, 34.81, 34.85, ~~34.87~~, 34.89, 34.91, 34.101, and 34.111.

(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:

*contains*  
*which* (1) In § 34.11, Form NRC-313 is approved under control number 3150-0120. *The collection requirements*

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

Subpart A -- Specific Licensing Requirements

See § 34.3.

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

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

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

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

- (1) Initial training;
- (2) Periodic training;
- (3) On-the-job training;
- (4) Means to be used by the licensee to determine the radiographer's knowledge and

~~(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

understanding of and ability to comply with Commission regulations and licensing requirements, and the operating and emergency procedures of the applicant; and

See § 34.11(b)(6).

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

(6) Means to be used by the licensee to determine the radiographer's assistant's knowledge and understanding of and ability to

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), and the description of and the means to determine the radiographer's knowledge and understanding of these subjects, the applicant affirms that all individuals acting as radiographers will be certified in radiation safety through the Certification Program for Industrial Radiography Radiation Safety Personnel of the American Society for Nondestructive Testing, Inc. (ASNT-IRRSP) prior to commencing duties as radiographers. From April 18, 1991, to the date of the renewal of an existing license, an approved license application is deemed to include the option, for individuals who are certified in radiation safety through the ASNT-IRRSP, to substitute ASNT-IRRSP certification in lieu of the described means to determine a radiographer's knowledge and understanding of the subjects in § 34.43(a)(1). This paragraph does not affect the licensee's responsibility to ensure that radiographers are properly trained in accordance with § 34.43(a).

See § 34.13(b)(4).



comply with the operating and emergency procedures of the applicant;

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

(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.

(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

(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 semiannual inspections of the job performance of each radiographer and radiographer's assistant as described in § 34.43(d).

See § 34.43(d)(1).

See § 34.43(d)(2).

See § 34.79.

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

(g) The applicant shall designate a Radiation Safety Officer responsible for implementing the licensee's radiation safety program. The Radiation Safety Officer shall meet the qualifications and duties described in § 34.41.

(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.

Subpart B --  
Radiation Safety Requirements

EQUIPMENT CONTROL

Section 34.20 Performance requirements for radiography equipment.

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

- (a) Each radiographic exposure device and all associated equipment must meet the requirements specified in American National Standard N432-1980 "Radiological Safety for the Design and Construction of

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

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

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

(i) The applicant shall submit to the Commission a list and description of permanent radiographic installations which are at their place of business and storage locations where radioactive material is stored 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

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.

publication has been approved for incorporation by reference by the Director of the Federal Register in accordance with 5 U.S.C. 552(a). This publication may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402 and from the American National Standards Institute, Inc., 1430 Broadway, New York, New York 10018, Telephone (212) 642-4900. Copies of the document are available for inspection at the Nuclear Regulatory Commission Library, 7920 Norfolk Avenue, Lower Level, Bethesda, Maryland, 20814. A copy of the document is also on file at the Office of the Federal Register, 800 North Capitol Street NW., Washington, DC 20408.

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

(1) Each radiographic exposure device must have attached to it by the user, a durable, legible, clearly visible label bearing the --

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

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

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

(iv) Manufacturer of the sealed source; and

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

(2) Radiographic exposure devices intended for use as Type B transport containers must meet the

(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 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

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

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.

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 ensuring that the source will not be accidentally withdrawn from the changer when connecting or disconnecting the drive cable to or from a source assembly.

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

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

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

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

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

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

(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.

(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 not have a radiation level in excess of 0.5 millisieverts (50 millirems) per hour at 15 centimeters (6 inches) from any exterior surface of the device.

Radiographic exposure devices measuring a minimum of 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.

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 not have no a radiation level in excess of 2 millisieverts (200 millirems) per hour at any exterior surface, and 0.1 millisieverts (10 millirems) per hour at 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

(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

changers must meet the requirements of Section 34.20, and Section 34.21 applies only to storage containers (source changers).

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

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

(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.

of § 34.20. Section 34.21 applies only to storage containers.

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

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

(1) Each radiographic exposure device ~~must~~ have a lock or outer locked container designed to prevent unauthorized or accidental removal of the sealed source from its shielded position. The exposure device or its container must be kept locked (and if a keyed lock, with the key removed at all times), when not under the direct surveillance of a radiographer or a radiographer's assistant or as otherwise may be authorized in § 34.51. In addition, during radiographic operations the sealed source assembly must be manually secured in the shielded position each time the source is returned to that position in those exposure devices manufactured prior to January 10, 1992.

(2) Each sealed source storage container and source changer ~~must~~ *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 must be kept locked when containing sealed sources except when under the direct surveillance of a radiographer or a radiographer's assistant.

(b) Radiographic exposure devices, source changers, and

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

Section 34.23 Storage precautions.

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

See § 34.35.

Section 34.24 Radiation survey instruments.

The licensee shall maintain sufficient calibrated and operable radiation survey instruments to make physical radiation surveys as required by this part and Part 20 of this chapter. Each radiation survey instrument shall be calibrated at intervals not to exceed three months and after each instrument servicing and a record shall be maintained of the results of each instrument calibration and date thereof for three years after the date of calibration. Instrumentation required by this section shall have a range such that two milliroentgens per hour through one roentgen per hour can be measured.

Section 34.25 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 must be capable of measuring a range from 0.02 millisieverts (2 millirems) per hour through 0.01 Sievert (1 rem) per hour. Survey instruments must be checked for operability 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.

*Location where RHM is present.*

(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 34.25 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.

(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

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

(b) Testing and recordkeeping requirements.

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

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

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

contamination on the sealed source. An acceptable leak test for sealed sources in the possession of a radiography licensee would be to test at the nearest accessible point to the sealed-source storage position, or other appropriate measuring point, by a procedure to be approved pursuant to Section 34.11(f). Each record of leak test results must be kept in units of microcuries [or disintegrations per minute (dpm)] and retained for inspection by the Commission for three years after it is made.

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

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

(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 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 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 must be sent to the Administrator of the appropriate Nuclear Regulatory Commission's Regional Office listed in Appendix D of Part 20 of this chapter "Standards for Protection Against Radiation."

(e) A sealed source which is not fastened to or contained in a radiographic exposure device must have permanently attached to it a durable tag at least one (1) inch square bearing the prescribed radiation caution symbol in

-- Radioactive Material -- Do Not Handle -- Notify Civil Authorities if Found.''

conventional colors, magenta, purple or black on a yellow background, and at least the instructions: "Danger -- Radioactive Material -- Do Not Handle -- Notify Civil Authorities if Found."

(f) Each exposure device using DU shielding and an "S" tube configuration must be periodically tested for depleted uranium contamination. This test may be performed by the licensee using available test kits or the exposure device may be returned to the manufacturer for such testing. This test must be undertaken at intervals not to exceed 12 months and should such testing reveal the presence of DU contamination, the exposure device must be removed from use and arrangements for proper disposal in accordance with 10 CFR Part 61 must be made. A record of the DU leak-test must be made in accordance with § 34.67.

#### Section 34.26 Quarterly inventory.

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

#### Section 34.27 Utilization logs.

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

#### Section 34.29 Quarterly inventory.

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

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

See § 34.71 .

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

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

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

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

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

(b) The licensee shall conduct a program 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.

Section 34.29 Permanent radiographic installations.

(a) Permanent radiographic installations having high radiation

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 inspections and maintenance performed must be made in accordance with § 34.73. If defects are found, the equipment must be removed from service until repaired, and a record must be made in accordance with § 34.73.

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

(b) Each entrance that is used for personnel access to the high radiation area in a permanent radiographic installation to which this section applies shall have both visible and audible warning signals to warn of the presence of radiation. The visible signal shall be actuated by radiation whenever the source is exposed. The audible signal shall be actuated when an attempt is made to enter the installation while the source is exposed.

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

## REPORTING

Section 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

Section 34.33 Permanent radiographic installations.

(a) Permanent radiographic installations must have high radiation area entrance controls of the types described in § 20.1601(a)(2), (a)(3), or (b) of this chapter and 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 must have both visible and audible warning signals to warn of the presence of radiation. The visible signal must be actuated by radiation whenever the source is exposed. The audible signal must be actuated when an attempt is made to enter the installation while the source is exposed.

(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 equipment use test 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 must be immediately labeled as defective and repaired before industrial radiographic operations are resumed. Test records must be maintained in accordance with § 34.75.

See § 34.101.

and Evaluation of Operational Data,  
U.S. Nuclear Regulatory  
Commission, Washington, DC 20555,  
within 30 days of the occurrence of  
any of the following incidents  
involving radiographic equipment:

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

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

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

(b) The licensee shall include  
the following information in each  
report submitted under paragraph (a)  
of this section:

(1) A description of the  
equipment problem.

(2) Cause of each incident, if  
known.

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

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

(5) Actions taken to establish  
normal operations.

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

(7) Qualifications of personnel  
involved in the incident.

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

See § 34.23.

Section 34.35 Labels, storage, and  
transportation precautions.

(a) Labels.

(1) The licensee may not use a source changer or container to store licensed material unless the source changer or the container has securely attached to it a durable, legible, and clearly visible label. The label must contain the radiation symbol specified in § 20.1904 of this chapter and the wording

CAUTION (OR DANGER)  
RADIOACTIVE MATERIAL--DO NOT HANDLE  
NOTIFY CIVIL AUTHORITIES (OR NAME OF COMPANY)

(2) The licensee may not transport licensed material unless the material is packaged, 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 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 include:

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

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

#### Section 34.31 Training.

(a) The licensee shall not permit any individual to act as a



radiographer until such individual:

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

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

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

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

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

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

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

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

#### Section 34.43 Training.

(a) The licensee shall not permit any individual to act as a radiographer until the 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 Parts 171-173, 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 shall not permit any individual to act as a radiographer's assistant until the 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 Parts 171-173, 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.

(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 semiannual 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 semiannual 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;

see 34.11(d)

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

See Appendix A

- (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 34.32 Operating and emergency procedures.

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

- (a) The handling and use of licensed sealed sources and radiographic exposure devices to be employed such that no person is likely to be exposed to radiation doses in excess of the limits established in Part 20 of this chapter "Standards for Protection Against Radiation";

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 such that no person is

(b) Methods and occasions for conducting radiation surveys;

(c) Methods for controlling access to radiographic areas;

(d) Methods and occasions for locking and securing radiographic exposure devices, storage containers and sealed sources;

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

(f) Transporting sealed sources to field locations, including packing of radiographic exposure devices and storage containers in the vehicles, posting of vehicles and control of the sealed sources during transportation;

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

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

(i) Maintenance of records.

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

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

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

See § 34.32(k).

See § 34.32(g)

See 34.32(h)

See § 34.32(i), et al

likely to be exposed to radiation doses in excess of the limits established in Part 20 of this chapter "Standards for Protection Against Radiation";

(2) Methods and occasions for conducting radiation surveys;

(3) Methods for controlling access to radiographic areas;

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

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

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

See § 34.45(a)(11).

See § 34.45(a)(10).

See § 34.45(a)(13).

(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) Forms of records.

at least have 25 APR 93

### Section 34.33 Personnel monitoring.

(a) The licensee may not permit any individual to act as a radiographer or a radiographer's assistant unless, at all times during radiographic operations, each such individual wears a direct reading pocket dosimeter, an alarm ratemeter, and either a film badge or a thermoluminescent dosimeter (TLD) except that for permanent radiography facilities where other appropriate alarming or warning devices are in routine use, the wearing of an alarming ratemeter is not required. Pocket dosimeters must have a range from zero to at least 200 milliroentgens and must be recharged at the start of each shift. Each film badge and TLD must be assigned to and worn by only one individual.

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

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

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

(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 shall 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 2 millisieverts (200 millirems) and must be recharged at the start of each shift. In cases where the exposure will be greater than 2 millisieverts (200 millirems) an exemption must be applied for to use a pocket dosimeter with a higher endpoint. Each film badge and TLD must be assigned to and worn by only one individual. Film badges and TLDs must be replaced at least monthly. After replacement, each film badge or TLD must be promptly processed.

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

(c) Pocket dosimeters must be checked at periods not to exceed 12 months for correct response to radiation, and records must be maintained in accordance with § 34.83. Acceptable dosimeters must read within plus or minus 30 percent of the true radiation exposure.

(d) If an individual's pocket dosimeter is found to be off-scale, and the possibility of radiation exposure cannot be ruled out as the cause, the individual's film badge or TLD must be immediately sent for processing. In addition, the individual shall not work with licensed material until a determination of the individual's radiation exposure has been made. This determination must be made by the RSO or designee. The results of this determination must be included in the records maintained in accordance with § 34.83.

(e) If a film badge or TLD is lost or damaged, the worker shall cease work immediately until a replacement film badge or TLD is provided and the exposure is calculated for the time period from issuance to loss or damage of the film badge or TLD. The results of the calculated exposure and the time period for which the film badge or TLD was lost or damaged must be included in the records maintained in accordance with § 34.83.

(f) Reports received from the film badge or TLD processor must be retained in accordance with § 34.93.

(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.

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

(f) Each alarm ratemeter must --

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

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

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

(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.

PRECAUTIONARY PROCEDURES  
IN RADIOGRAPHIC OPERATIONS

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

Section 34.42 Posting.

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

Section 34.43 Radiation surveys.

The licensee shall ensure that:

(a) At least one calibrated and operable radiation survey instrument is available at the location of its radiographic operations whenever radiographic operations are being performed, and at the storage area, as defined in Section 34.2, whenever a radiographic exposure device, a storage container, or source is being placed in storage.

(b) A survey with a calibrated and operable radiation survey

(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.

See § 34.51.

See § 34.53.

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

instrument is made after each exposure to determine that the sealed source has been returned to its shielded position. The entire circumference of the radiographic exposure device must be surveyed. If the radiographic exposure device has a source guide tube, the survey must include the guide tube.

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

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

See § 34.41.

See § 34.42.

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.

#### 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



Section 34.44 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 Section 34.43(b) to determine that the sealed source has returned to the shielded position after an exposure, he shall be under the personal supervision of a radiographer. The personal supervision shall include: (a) The radiographer's personal presence at the site where the sealed sources are being used, (b) the ability of the radiographer to give immediate assistance if required, and (c) the radiographer's watching the assistant's performance of the operations referred to in this section.

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.

Section 34.53 Posting.

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

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 must include: (a) the radiographer's personal presence at the site where the sealed sources are being used, (b) the ability of the radiographer to give immediate assistance if required, and (c) the radiographer's watching the assistant's performance of the operations referred to in this section.

Section 34.57 Requirements or radiographic operations conducted outside of a permanent radiographic installation.

Whenever radiography will be performed outside of a permanent

## EXEMPTIONS

Section 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.

radiographic installation the radiographer must be accompanied by another qualified radiographer or an individual with, at least, the qualifications of 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.

## APPENDIX A

I. Fundamentals  
of Radiation Safety

See § 34.111.

- 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.

See § 34.43(f).

II. Radiation Detection  
Instrumentation To Be Used

- A. Use of radiation survey instruments:
  - 1. Operation.
  - 2. Calibration.
  - 3. Limitations.
- B. Survey techniques.
- C. Use of personnel monitoring equipment:
  - 1. Film badges and thermoluminescent dosimeters (TLD's).

2. Pocket dosimeters.
3. Alarm ratemeters

III. Radiographic  
Equipment To Be Used

- A. Remote handling equipment.
- B. Radiographic exposure  
devices.
- C. Storage containers.

IV. Inspection and Maintenance  
Performed by the Radiographers

V. Case Histories of  
Radiography Accidents

\*\*\* END OF DOCUMENT \*\*\*

Subpart E -- Records

Section 34.61 Records of specific  
license for radiography.

Each licensee shall maintain a  
copy of their license until the  
Commission terminates the license.

See § 34.24.

Section 34.63 Records of receipt and  
transfer of sealed sources.

Each licensee shall maintain  
records showing the receipts and  
transfers of sealed sources:

(a) records must include the  
date, the individual making the

See § 34.35(c).

record, the radionuclide, number of curies, and make, model, and serial number of each sealed source and device, as appropriate.

(b) records must be retained for 3 years after the record is made.

Section 34.65 Records of radiation survey instruments.

Each licensee shall maintain records of the calibrations of their radiation survey instruments. The record must be retained for 3 years after the record is made.

See § 34.26.

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

Each licensee shall maintain records of leak test results in units of Becquerels (curies). The records must be retained for 3 years after the record is made.

See § 34.27.

Section 34.69 Records of quarterly inventory.

Each licensee shall maintain records of the quarterly inventory.

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

(b) The records must be retained for 3 years after the record is made.

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

See § 34.28(c).

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 logs must be retained for 3 years after the log is made.

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 must include the date of check, name of inspector, equipment involved, any defects found, and repairs made.

(c) The record must be retained for 3 years after the record is made.

See § 34.31(c).

*See 34.29(c)*

Section 34.75 Records of permanent radiographic installations.

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

(b) The records must be retained for 3 years after the record is made.

Section 34.79 Records of training.

Each licensee shall maintain the following records of training:

(a) 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) 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.

See § 34.32.

(c) records must be retained for 3 years after the record is made.

See § 34.33(b).

Section 34.81 Copies of operating and emergency procedures.

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

See § 34.33(e).

Section 34.83 Records of personnel monitoring.

Each licensee shall maintain the following exposure records:

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

See § 34.43(d).

(b) records of reports received from the film badge or TLD processor until the Commission terminates the license.

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

See § 34.4.

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.

Section 34.87 Forms 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;

See § 34.30.

(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)



See § 34.51.

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.

Section 34.123 Criminal penalties.

(a) Section 223 of the Atomic Energy Act of 1954, as amended, provides for criminal sanctions for willful violation of, or conspiracy to violate, any regulation issued under sections 161b, 161i, or 161o of the Act. For purposes of section 223, all the regulations in part 34 are issued under one or more of section 161b, 161i, or 161o, except for the sections listed in paragraph (b) of this section.

(b) The regulations of part 34 that are not issued under sections 161b, 161i, or 161o for the purposes of section 223 are as follows: § § 34.1, 34.2, 34.3, 34.4, 34.8, 34.11, 34.51, 34.61, and 34.63.

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