

641—39.10(136C) Licenses for industrial radiography and radiation safety requirements for industrial radiographic operations. In addition to the rules of this chapter, RAM facilities shall comply with the requirements of 10 CFR Part 34, “Licenses for Industrial Radiography and Radiation Safety Requirements for Industrial Radiographic Operations,” unless specific exemptions apply.

39.10(1) Adoption by reference—conditions. The provisions of 10 CFR Part 34 are hereby adopted by reference and are subject to the following conditions:

- a. Not adopted by reference are 10 CFR 34.5, 34.8, 34.11, 34.41(b), 34.41(c), and 34.121.
- b. Where the word “NRC” appears in 10 CFR 34.42(c)(1), 34.42(d), 34.43(b)(1)(both mentions) and (c)(1)(both mentions), and 34.89(b)(2), substitute the words “Iowa HHS.”
- c. Where the words “NRC or an Agreement State” appear in 10 CFR 34.27(a), substitute the words “Iowa HHS, NRC, or an Agreement State.”
- d. Where the words “Director, Office of Nuclear Material Safety and Safeguards by appropriate methods listed in 30.6(a) of this chapter” appear in 10 CFR 34.27(d) and 34.43(a)(1), substitute the words “Iowa HHS.”
- e. In 10 CFR 34.27(d), the sentence “A copy of the report must be sent to the Administrator of the appropriate Nuclear Regulatory Commission’s Regional Office listed in appendix D of 10 CFR part 20 of this chapter “Standards for Protection Against Radiation”” is deleted and does not apply.
- f. Where the word “Commission” appears in 10 CFR 34.3, 34.20(a)(2), 34.27(d), 34.41(b), 34.42(b), 34.43(a)(2) and (e) and (e)(3), 34.61(both mentions), 34.81, 34.83(c) and (d), 34.111, and Appendix A, substitute the words “Iowa HHS.”
- g. Where the words “Commission or an Agreement State” appear in 10 CFR 34.27(b) and (c)(both mentions) and (e) and 34.41(c), substitute the words “Iowa HHS, NRC, or an Agreement State.”
- h. Where the words “NRC’s office of Nuclear Material Safety and Safeguards” and “NRC regional office” appear in 10 CFR 34.101, substitute the words “Iowa Health and Human Services – Bureau of Radiological Health, 321 E 12th Street, Des Moines, Iowa 50319.”
- i. Where the words “When operating under reciprocity pursuant to 150.20 of this chapter, a copy of the Agreement State license authorizing the use of licensed materials” appears in 10 CFR 34.89(b)(12), substitute the words “When operating under reciprocity pursuant to 150.20 of this chapter, a copy of the NRC or Agreement State license authorizing the use of licensed materials.”
- j. For the purpose of this chapter, where 10 CFR 34.8 and 34.11 require “NRC Form 313,” licensees shall use “Iowa HHS Form 313.”
- k. Where 10 CFR Part 30 references fees listed in 10 CFR Parts 170 and 171, licensees shall comply with the fee requirements specified in rule 641—37.9(136C).

39.10(2) General requirements for use of radiation machines in industrial radiography. The requirements of this subrule are in addition to, and not in substitution for, other applicable requirements of 10 CFR 34, 641—Chapter 37, and this chapter. These rules apply to all licensees or registrants who use radiation for industrial or nonhuman purposes.

a. Exemptions.

(1) Uses of certified and certifiable cabinet X-ray systems designed to exclude individuals are exempt from the requirements of this chapter, except for the requirements of subparagraphs 39.10(2) “e”(2) and “f”(3).

(2) Radiation machines determined by the agency to constitute a minimal threat to human health and safety in accordance with 641—subrule 37.3(1) are exempt from the rules in this chapter, except for the requirements of this subrule.

b. Receipt, transfer, and disposal of sources of radiation. Each registrant shall maintain records showing the receipt, transfer, and disposal of machine-produced sources of radiation.

(1) These records shall include all of the following:

1. The date;
 2. The name of the individual making the record; and
 3. The make, model, and serial number of each source of radiation and device, as appropriate.
- (2) Records shall be maintained for three years after they are made.

c. Radiation survey instruments.

(1) The licensee or registrant shall maintain sufficient calibrated and operable radiation survey instruments at each location where sources of radiation are present to make physical radiation surveys as required by this chapter and 641—subrule 37.11(13). Instrumentation required by this subrule shall have a range such that two millirems (0.02 millisievert) per hour through one rem (0.01 sievert) per hour can be measured.

(2) Notwithstanding the requirements of 641—paragraph 37.11(13)“c,” each radiation survey instrument shall be calibrated:

1. At energies appropriate for use and at intervals not to exceed six months and after each instrument servicing;

2. Such that accuracy within plus or minus 20 percent of the calibration source can be demonstrated at each point checked;

3. At 2 points located approximately 1/3 and 2/3 of full-scale on each scale for linear scale instruments; at midrange of each decade, and at 2 points of at least 1 decade for logarithmic scale instruments; and at 3 points between 2 and 1,000 mrem per hour for digital instruments; and

4. By a person licensed or registered by the agency, another agreement state, or the Commission to perform such service.

(3) Records of these calibrations shall be maintained for three years after the calibration date for inspection by the agency.

(4) Each radiation survey instrument shall be checked with a radiation source at the beginning of each day of use and at the beginning of each work shift to ensure it is operating properly.

d. Utilization logs.

(1) Each registrant shall maintain current logs of the use of each source of radiation. The logs shall include all of the following:

1. A unique identification, which includes the make, model and serial number of each source of radiation;

2. The identity of the radiographer using the source of radiation;

3. The date(s) each source of radiation is energized or used and the number of exposures made.

(2) Utilization logs must be kept on clear, legible records containing all the information required by this chapter. Copies of utilization logs shall be maintained for agency inspection for three years from the date of the recorded event. The records shall be kept at the location specified by the license or certificate of registration.

e. Inspection and maintenance.

(1) Each registrant shall perform visual and operability checks on survey meters, radiation machines and associated equipment before use on each day that the components are to be used to ensure that the components are in good working condition and that required labeling is present. Survey instrument operability must be performed using check sources or other appropriate means.

(2) Each registrant shall have written procedures and conduct a program at intervals not to exceed three months, or prior to the first use thereafter, of inspection and maintenance of radiation machines, survey instruments, and associated equipment to ensure proper functioning of components important to safety.

1. All appropriate parts shall be maintained in accordance with manufacturer’s specifications.

2. Replacement components shall meet design specifications.

3. This program shall cover, as a minimum, the items in Appendix F of this chapter.

(3) If equipment defects or issues are found, the equipment must be removed from service until repaired.

(4) A record of equipment defects or issues and of any maintenance performed under the requirements of this chapter must be retained for three years after the record is made. The record must include all of the following:

1. The date of check or inspection;

2. The name of the inspector;

3. The specific equipment involved;

4. Any problems found; and

5. What repair or maintenance was performed, if any.
- f. *Permanent radiographic installations.* Permanent radiographic installations having high radiation area entrance controls of the type described in 641—subparagraphs 37.11(15) “a”(2) and “a”(3) shall also meet all of the following requirements:
 - (1) Each entrance that is used for personnel access to the high radiation area shall have both visible and audible warning signals to warn of the presence of radiation.
 1. The visible signal shall be activated by radiation.
 2. The audible signal shall be activated when an attempt is made to enter the installation while the source is exposed.
 - (2) The control device or alarm system shall be tested for proper operation at the beginning of each day of equipment use.
 1. If a control device or alarm system is operating improperly, it shall be immediately labeled as defective and repaired before industrial radiographic operations are resumed.
 2. Records of these tests shall be maintained for inspection by the agency for three years from the date of the event.
- g. *Training and testing for radiographic personnel.*
 - (1) Radiographer’s assistant requirements. No registrant shall permit any individual to act as a radiographer’s assistant, as defined in this chapter, until it has been documented on the appropriate agency form or equivalent that such individual has received copies of, and has demonstrated an understanding of, the following:
 1. The subjects outlined in Appendix A;
 2. The rules contained in this chapter and the applicable sections of 641—Chapter 37.
 3. The appropriate conditions of certificate(s) of registration;
 4. The registrant’s operating and emergency procedures;
 5. A developed competence to use, under the personal supervision of the radiographer, the registrant’s radiation machine and radiation survey instruments that the assistant will use;
 - (2) Radiographer requirements. No registrant shall permit any individual to act as a radiographer until it has been documented to the agency that such individual has:
 1. Completed the requirements of subparagraph 39.10(2) “g”(4);
 2. Completed on-the-job training as a radiographic trainee supervised by one or more radiographic trainers. The on-the-job training shall be documented on the appropriate agency form or equivalent and shall include a minimum of one month (160 hours) of active participation in the performance of industrial radiography utilizing radiation machines. Active participation does not include safety meetings or classroom training;
 3. Demonstrated competence in the use of radiation machines and radiation survey instruments that may be employed in industrial radiographic assignments by successful completion of a practical examination covering this material;
 4. Completed, within the last five years, an appropriate examination and possesses a current ID card.
 - (3) Radiographer trainer. No individual shall act as a radiographer trainer unless such individual:
 1. Has met the requirements of subparagraph 39.10(2) “g”(1) and numbered paragraph 39.10(2) “g”(2) “2”;
 2. Has one year of documented experience as an industrial radiographer and possesses a current ID card issued at least one year prior to acting as a trainer; and
 3. Is named on the certificate of registration issued by the agency and under which an individual is acting as a radiographer trainer.
 - (4) Radiation safety officer (RSO). The RSO, as defined in rule 641—37.2(136C), shall ensure that radiation safety activities are being performed in accordance with approved procedures and regulatory requirements in the daily operation of the registrant’s program.
 1. An RSO shall be designated for every certificate of registration issued by the agency.
 2. The RSO’s qualifications shall include the following:
 - A. Possession of a high school diploma or a certificate of high school equivalency based on the GED tests;

B. Completion of the training and testing requirements of subparagraphs 39.10(2) “g”(1), “g”(3), and “g”(4).

C. Formal training in the establishment and maintenance of a radiation protection program.

D. The agency will consider alternatives when the RSO has either appropriate training or experience, or both, in the field of ionizing radiation and, in addition, has adequate formal training with respect to the establishment and maintenance of a radiation safety protection program.

3. The specific duties of the RSO include but are not limited to the following:

A. 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;

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

C. To ensure that required radiation surveys are performed and documented in accordance with these rules, including any corrective measures when levels of radiation exceed established limits;

D. 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 rule 641—37.11(136C);

E. To ensure that any required interlock switches and warning signals are functioning and that radiation signs, ropes, and barriers are properly posted and positioned;

F. To investigate and report to the agency each known or suspected case of radiation exposure to an individual or radiation level detected in excess of limits established by these rules, and each theft or loss of source(s) of radiation, to determine the cause, and to take steps to prevent its recurrence;

G. To have a thorough knowledge of management policies and administrative procedures of the registrant;

H. To assume control and have the authority to institute corrective actions, including shutdown of operations when necessary in emergency situations or unsafe conditions;

I. To maintain records as required by these rules (Appendix C contains more information);

J. To ensure the proper storing, labeling, transport, and use of sources of radiation;

K. To ensure that quarterly inventory and inspection and maintenance programs are performed in accordance with the requirements of this chapter;

L. To ensure that personnel are complying with these rules, the conditions of the registration, and the operating and emergency procedures of the registrant; and

M. To ensure that annual refresher safety training has been provided for each radiographer and radiographer’s assistant at intervals not to exceed 12 months.

(5) Training and testing records. Each registrant shall maintain, for agency inspection, training and testing records that demonstrate that the applicable requirements of subparagraphs 39.10(2) “g”(1) and “g”(2) are met.

1. Records of training for all industrial radiographic personnel must include all of the following:

A. Personnel certification documents and verification of certification status;

B. Copies of written tests;

C. Dates of oral and practical examinations; and

D. The names of individuals conducting and receiving the oral and practical examinations.

2. Records of annual refresher training and semiannual inspection of job performance for all industrial radiographic personnel must include all of the following:

A. The topics discussed during the refresher safety training;

B. The dates the annual refresher safety training was conducted; and

C. The names of the instructors and attendees.

3. For inspections of job performance, the records must also include a list showing the items checked and any noncompliance observed by the RSO.

4. Records shall be maintained until disposal is authorized by the agency. The agency cannot release records for disposal unless the records have been maintained at least three years.

(6) Reciprocity.

1. Reciprocal recognition by the agency of an individual radiographer certification will be granted provided that all of the following conditions are met:

A. The individual holds a valid certification in the appropriate category and class issued by a certifying entity as defined in this chapter;

B. The requirements and procedures of the certifying entity issuing the certification require the same or comparable certification standards as those required by subparagraphs 39.10(2)“g”(1) through “g”(5); and

C. The individual submits a legible copy of the certification to the agency prior to entry into Iowa.

2. Enforcement actions with the agency, another agreement state, or the Commission or any sanctions by an independent certifying entity may be considered when reviewing a request for reciprocal recognition from a licensee, registrant, or certified radiographer.

3. Certified radiographers who are granted reciprocity by the agency shall maintain the certification upon which the reciprocal recognition was granted or, prior to the expiration of such certification, shall meet the requirements of subparagraph 39.10(2)“g”(2).

h. Internal audits.

(1) The RSO or designee shall conduct an inspection program of the job performance of each radiographer and radiographer’s assistant to ensure that these rules and the registrant’s operating and emergency procedures are followed. The inspection program must:

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

2. Provide that, if a radiographer or radiographer’s assistant has not participated in an industrial radiographic operation for more than six months since the last audit, the radiographer or radiographer’s assistant must demonstrate understanding of the subjects contained in Appendix A of this chapter by a practical examination before the individual can participate in a radiographic operation.

(2) When a single individual serves as both radiographer and RSO and performs all radiography operations, an inspection program is not required. Alternatives shall be submitted and approved by the department in these situations.

(3) Records of audits shall be maintained by the licensee or registrant for agency inspection for three years from the date of the audit.

i. Personnel monitoring control.

(1) The personnel monitoring program shall meet the applicable requirements of rule 641—37.11(136C).

(2) Records of pocket dosimeter readings of personnel exposures and yearly operability checks required in 10 CFR 34.47(c) shall be maintained for three years by the licensee or registrant for agency inspection.

1. If the dosimeter readings were used to determine external radiation dose (i.e., no TLD or film badge exposure records exist), the records shall be maintained for three years after they are recorded.

2. Records of estimates of exposures as a result of off-scale personal direct reading dosimeters, or lost or damaged film badges, OSLs, or TLDs, shall be maintained until the agency terminates the license.

(3) Reports received from the film badge, OSL device or TLD processor shall be kept for inspection by the agency until the agency terminates the license.

j. Access control. During each industrial radiographic operation, a radiographer or radiographer’s assistant shall maintain continuous, direct visual surveillance of the operation to protect against unauthorized entry into a restricted area, radiation area, or high radiation area, except at permanent radiographic installations where all entryways are locked to protect against unauthorized or accidental entry and the requirements of paragraph 39.10(2)“f” are met.

k. Posting.

(1) Notwithstanding any provisions in 641—subrule 37.11(21), areas in which radiography is being performed shall be conspicuously posted as required by 641—paragraphs 37.11(20)“a” and “b.”

(2) Whenever practicable, ropes or barriers shall be used in addition to appropriate signs to designate areas in accordance with 641—subrule 37.11(20) and to help prevent unauthorized entry.

(3) Notwithstanding the requirements of subparagraph 39.10(2)“k”(1), a restricted area may be established in accordance with 641—subrule 37.11(20) and may be posted in accordance with 641—paragraphs 37.11(20)“a” and “b,” i.e., both signs may be posted at the same location at the boundary of the restricted area.

l. Temporary job site requirements. Each registrant conducting industrial radiography at a temporary job site shall have the following records available at that site for inspection by the department:

- (1) Appropriate certificate of registration or equivalent document;
- (2) The appropriate operating and emergency procedures;
- (3) The applicable agency rules; and
- (4) Survey records required pursuant to subparagraph 39.10(3)“e”(4) for the period of operation at the site.

m. Notifications.

(1) The agency shall be notified of thefts or losses of sources of radiation, overexposures, and excessive levels in accordance with 641—subrule 37.13(1) and 10 CFR 20.2203.

(2) Each registrant shall submit a written report within 30 days to the department whenever one of the following events occurs:

1. An indicator on a radiation-producing machine fails to show that radiation is being produced; and
2. An exposure switch fails to terminate production of radiation when turned to the off position.

(3) The licensee or registrant shall include the following information in each report submitted in accordance with 10 CFR 34.101 and 641—subrule 37.13(4):

1. The licensee or registrant name and license or registration number;
2. The name of the prescribing physician, if applicable;
3. A description of the event, including:
 - A. The probable cause;
 - B. The manufacturer and model number (if applicable) of any equipment that failed or malfunctioned;
4. The exact location of the event;
5. The date and time of the event;
6. The isotopes, quantities, and chemical and physical form of the licensed material involved;
7. Corrective actions taken or planned to prevent recurrence and the results of any evaluations or assessments;
8. The extent of exposure of individuals to radiation or to radioactive materials, without identification of individuals by name, and the effect, if any, on the individual(s) who received the administration or exposure; and
9. Certification that the licensee or registrant notified the individual or the individual’s responsible relative or legal guardian and the referring physician in compliance with the requirements of this chapter and, if not, why not.

n. Copies of operating and emergency procedures. Each registrant shall maintain a copy of current operating and emergency procedures until the agency terminates the license. Superseded material must be retained for three years.

39.10(3) *Radiation safety requirements for the use of radiation machines in industrial radiography.* The requirements of this subrule are in addition to, and not in substitution for, other applicable requirements of 10 CFR 34, 641—Chapter 37, and this chapter. These rules apply to all licensees or registrants who use radiation for industrial or nonhuman purposes.

a. Locking of sources of radiation. The control panel of each radiation machine shall be equipped with a locking device that will prevent the unauthorized use of an X-ray system or the accidental production of radiation. The radiation machine shall be kept locked and the key removed at all times, except when under the direct visual surveillance of a radiographer.

b. Permanent storage precautions. Radiation machines shall be secured while in storage to prevent tampering or removal by unauthorized individuals.

c. Requirements for radiation machines used in industrial radiographic operations.

(1) Equipment used in industrial radiographic operations involving radiation machines manufactured after January 1, 1992, shall be certified at the time of manufacture to meet the criteria set forth by ANSI N537-1976.

(2) The registrant's name and city or town where the main business office is located shall be prominently displayed with a durable, clearly visible label(s) on all vehicles used to transport radiation machines for temporary job site use.

d. Operating and emergency procedures.

(1) The registrant's operating and emergency procedures shall include instructions in, at a minimum, the following:

1. Operation and safety instruction on the radiation machine(s) to be used;
2. Methods and occasions for conducting radiation surveys;
3. Methods for controlling access to radiographic areas;
4. Methods and occasions for locking and securing sources of radiation;
5. Personnel monitoring and the use of personnel monitoring equipment, including steps that must be taken immediately by radiography personnel in the event a pocket dosimeter is found to be off-scale;
6. Minimizing exposure of individuals in the event of an accident;
7. The procedure for notifying proper personnel in the event of an accident;
8. Maintenance of records; and
9. Inspection and maintenance of radiation machines.

(2) Each registrant shall provide, as a minimum, two radiographic personnel when radiation machines are used for any industrial radiography conducted other than at a permanent radiographic installation (shielded room, bay, or bunker). If one of the personnel is a radiographer's assistant, the other shall be a radiographer trainer authorized by the certificate of registration.

(3) No individual other than a radiographer or a radiographer's assistant who is under the direct supervision of a radiographer trainer shall manipulate controls or operate equipment used in industrial radiographic operations.

e. Radiation surveys and survey records.

(1) No radiographic operation shall be conducted unless calibrated and operable radiation survey instrumentation, as described in paragraph 39.10(2) "c," is available and used at each site where radiographic exposures are made.

(2) A physical radiation survey shall be made after each radiographic exposure using radiation machines to determine that the machine is off.

(3) All potential radiation areas where industrial radiographic operations are to be performed shall be posted in accordance with paragraph 39.10(2) "c," based on calculated dose rates, before industrial radiographic operations begin. An area survey shall be performed during the first radiographic exposure to confirm that paragraph 39.10(2) "c" requirements have been met and that unrestricted areas do not have radiation levels in excess of the limits specified in 641—subparagraph 37.11(11) "a" (1).

(4) Records shall be kept of the surveys required by subparagraphs 39.10(3) "e" (1) and "e" (2). Such records shall be maintained for inspection by the agency for three years after completion of the survey. If the survey was used to determine an individual's exposure, however, the records of the survey shall be maintained until the agency authorizes their disposition.

f. Special requirements and exemptions for enclosed radiography.

(1) Systems for enclosed radiography, including shielded-room radiography and cabinet radiography, designed to allow admittance of individuals shall:

1. Comply with all applicable requirements of this chapter and 641—subparagraph 37.11(11) "a" (1). If such a system is a certified cabinet X-ray system, it shall comply with all applicable requirements of this chapter and 21 CFR 1020.40.

2. Be evaluated at intervals not to exceed one year to ensure compliance with the applicable requirements as specified in 641—subparagraph 37.11(11) "a" (1). Records of these evaluations shall be maintained for inspection by the agency for a period of three years after the evaluation.

(2) Certified and certifiable cabinet X-ray systems are exempt from the requirements of this chapter, except for the following:

1. Operating personnel must be provided with individual monitoring devices in accordance with the appropriate provisions of 641—subrule 37.11(14);
2. No registrant shall permit any individual to operate a cabinet X-ray system until such individual has received a copy of, and instruction in, the operating procedures for the unit and has demonstrated competence in its use. Records that demonstrate compliance with this subparagraph shall be maintained for inspection by the agency until disposition is authorized by the agency.
3. Tests for proper operation of interlocks used to control entry to the high radiation area or alarm systems, where applicable, shall be conducted and recorded every three months. Records of these tests shall be maintained for agency inspection until disposal is authorized by the agency.
4. The registrant shall perform an evaluation, at intervals not to exceed one year, to determine conformance with 641—subparagraph 37.11(11)“a”(1).
 - A. If such a system is a certified cabinet X-ray system, it shall be evaluated at intervals not to exceed one year to determine conformance with 21 CFR 1020.40.
 - B. Records of these evaluations shall be maintained for inspection by the agency for a period of three years after the evaluation.
- (3) Certified cabinet X-ray systems shall be maintained in compliance with 21 CFR 1020.40 unless prior approval has been granted by the agency pursuant to 641—subrule 37.3(1).
 - g. *Registration for industrial radiographic operations.*
 - (1) No person shall receive, possess, use, transfer, own, or acquire an analytical X-ray device, except as authorized by a registration issued in accordance with rule 641—37.8(136C).
 - (2) Each industrial radiography device shall be registered in accordance with the requirements of 641—subrule 37.8(2).
 - (3) In addition to the registration requirements of 641—subrule 37.8(2), an application for a certificate of registration shall include all of the following information:
 1. A schedule or description of the program for training radiographic personnel that specifies:
 - A. Initial training,
 - B. Periodic training,
 - C. On-the-job training, and
 - D. Methods to be used by the registrant to determine the knowledge, understanding, and ability of radiographic personnel to comply with agency rules, registration requirements, and the operating and emergency procedures of the applicant.
 2. Written operating and emergency procedures, including all items listed in Appendix B.
 3. A description of the internal inspection system or other management control to ensure that radiographic personnel follow registration provisions, rules of the agency, and the applicant’s operating and emergency procedures.
 4. A list of permanent radiographic installations and descriptions of permanent storage and use locations.
 5. A description of the organization of the industrial radiographic program, including delegations of authority and responsibility for operation of the radiation safety program.
 - (4) A certificate of registration will be issued if the requirements of rule 641—37.8(136C) and this subrule are met.

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