

Radiography Regulations



Radiography Regulations

Learning Objectives

- Review key regulations applicable to ind. radiography
 - Part 19 Notices, Instructions & Reports to Workers: Inspection & Investigations
 - Part 20 Standards for Protection Against Radiation
 - Part 30 Rules of General Applicability to Domestic Licensing of Byproduct Material
 - Part 34 Licenses for Industrial Radiography & Radiation Safety Requirements for Industrial Radiographic Operations

Training



Radiographer Certification 10 CFR 34 - App. A

I. Requirements for an Independent Certifying Organization

- 1. Be an organization whose members participate in, or have an interest in, the field of ind. radiography**
- 2. Make its membership available to the public nationwide & not restricted by race, color, religion, sex, age, natl. origin or disability**
- 3. Have a cert. program open to nonmembers, as well as members;**
- 4. Be an incorporated, nationally recognized organization, that is involved in setting national stds. of practice within its field**
- 5. Have an adequate staff, a viable system for financing its operations, & a policy- & decision-making review board**
- 6. Have a set of written organizational by-laws and policies that provide adequate assurance of lack of conflict of interest & a system for monitoring & enforcing those by-laws & policies**
- 7. Have a committee whose members are impartial, to review & approve certification guidelines & procedures, & to advise the organization's staff in implementing the certification program** 4

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8. Have a committee whose members are impartial to review complaints against certified individuals & determine sanctions
9. Have procedures describing all aspects of its certification program, maintain records of the current status of each individual's certification and the administration of its certification program;
10. Have procedures to ensure that certified individuals are provided due process with respect to the administration of its certification program, including the process of becoming certified and any sanctions imposed against certified individuals;
11. Have procedures for proctoring examinations, including qualifications for proctors. These procedures must ensure that the individuals proctoring each examination are not employed by the same company or corporation (or a wholly-owned subsidiary of such company or corporation) as any of the examinees;
12. Exchange information about certified individuals with the Commission and other independent certifying organizations and/or Agreement States and allow periodic review of its certification program and related records; and
13. Provide a description to the Commission of its procedures for⁵ choosing examination sites and for providing an appropriate examination environment

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II. Requirements for Certification Programs

All certification programs must:

1. Require applicants for certification to (a) receive training in the topics set forth in §34.43(g) or equivalent state regs, & (b) satisfactorily complete a written exam covering these topics
2. Require applicants for certification to provide documentation demonstrating the applicant has: (a) received training in the topics set forth in §34.43(g) or equivalent state regulations; (b) satisfactorily completed a minimum period of on-the-job training; & (c) has received verification by a state or a NRC licensee that the applicant has demonstrated ability to work independently as a radiographer
3. Include procedures to ensure that all exam questions are protected from disclosure
4. Include procedures for denying an application, revoking, suspending, & reinstating a certificate

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5. Provide a certification period of not less than 3 yrs. nor more than 5 yrs
6. Include procedures for renewing certifications and, if the procedures allow renewals without examination, require evidence of recent full-time employment & annual refresher training
7. Provide a timely response to inquiries, by telephone or letter, from members of the public, about an individual's cert. status

III. Requirements for Written Examinations

All examinations must be:

1. Designed to test an individual's knowledge & understanding of the topics listed in §34.43(g) or equivalent state requirements
2. Written in a multiple-choice format
3. Have test items drawn from a question bank containing psychometrically valid questions based on the material in 10 CFR 34.43(g).

ASNT Certification

ASNT Industrial Radiography Radiation Safety Personnel (IRRSP) Exam Specification

- The American Society for Nondestructive Testing (ASNT) has been designated by the NRC as an Independent Certifying Organization & administers the IRRSP Radiation Safety Certification program per policies & procedures approved by the NRC
- The IRRSP exam consists of 100 questions covering relevant topics The exam complies with the requirements of 10 CFR Part 34
- Passing score = 70%

ASNT IRRSP Examination Specification

1. Fundamentals of Radiation Safety (18)

1.1 Types of Radiation (6)

1.2 Origin of Radiation and Interaction with Matter (12)

2. Exposure and Effects (10)

2.1 Radiation Exposure (5)

2.2 Biological Effects of Exposure (5)

3. Controlling Exposure (7)

3.1 Distance (3)

3.2 Shielding (2)

3.3 Time (2)

4. Radiation Detection (20)

4.1 Radiation Survey Instruments (9)

4.2 Survey Requirements/Techniques (4)

4.3 Personnel Monitoring Devices (7)

5. Radiographic Equipment (15)

5.1 Exposure Devices (RAM/X-ray) and Collimators (8)

5.2 Source Changers and Storage Containers (2)

5.3 Daily/Quarterly Inspections (2)

5.4 RAM Inventory, Leak Tests, Repairs and Tagging (3)

ASNT IRRSP Examination Specification

6. Regulations (22)*

* Questions are evenly distributed among the topics listed.

Definitions

Licensing requirements

Notices, reports & records

Labeling, boundaries & posting

Maximum allowable doses

Personnel training requirements

Transportation requirements

Surveys & monitoring

Exposure equipment & storage requirements

7. O&E Procedures (8)

Site/Installation requirements (2)

Operating procedures (2)

Handling/securing of sources (2)

Personnel responsibilities (2)

ASNT IRRSP Certification

Summary of Experience & Training Required for IRRSP Certification

IRRSP Cert.	Experience (Hours)*	Training (Hrs.)
X-ray Only	60	40
RAM Only	320	40
RAM & X-ray	320 (RAM) + 60 (X-ray)	40

Radiographer Training

- Training Subjects - Radiation Safety (Administration)
- (from ASNT CP-IRRSP-1A, Rev. 5, 22 April 1998)
- Training provided to qualify applicants in accordance with paragraph 2.3.2.a of Part I of the program shall be presented on a formal basis. The training shall include the following subjects and is considered to satisfy the requirement for both X-ray and gamma ray radiography.

RSO Training Outline

Training Subjects - Radiation Safety (Administration) (from CP-IRRSP-1A, Rev. 5, April 1998)

Training shall be presented on a formal basis. Training must include the following subjects & satisfies requirements for X- & gamma radiography

I. Radiation Protection Requirements

- A. 10 CFR 20
- B. Reg. Guide 8.10

II. Notices and Instruction to Workers

- A. 10 CFR 19
- B. Reg. Guides 8.13 & 8.29

III. Reporting of Defects & Noncompliance (10 CFR 21)

IV. Specific Requirements for Ind. Radiography

- A. 10 CFR 20, 34
- B. Reg. Guide 10.6

V. Enforcement Criteria (10 CFR 2)

VI. Requirements for Source Material (10 CFR 40)

VII. Export & Import of Nuclear Material (10 CFR 110)

VIII. Reciprocity between USNRC and Agreement States (10 CFR 150)

IX. Fees, Reporting Req. & Miscellaneous Rules (10 CFR 170, Reg. Guide 10.1)

X. Transportation of Rad. Devices (10 CFR 71, 49 CFR 170-178, IEN Bulletin 87-47, Reg. Guide 7.3, IEN 90-56 Sample Transportation Instructions)

Length of the training = min. of 20 hours

Radiographer Training Outline

Training Subjects - Radiographer (from CP-IRRSP-1A, Rev. 6, Nov. 1998)

Training provided to qualify applicants in accordance with paragraph 2.3.1a of Part I of the program shall be presented on a formal basis. The training shall include the following subjects:

I. Fundamentals of Radiation Safety

- A. Characteristics of radiation (X-ray & gamma ray)
- B. Units of radiation dose and quantity of radioactivity
- C. Significance of radiation dose (hazards)
 - 1. Radiation protection stds.
 - 2. Biological effects of radiation dose
 - 3. Case histories of radiography overexposures
- D. Levels of radiation from sources of radiation
- E. Methods of controlling radiation dose:
 - 1. Working time
 - 2. Working distance
 - 3. Shielding

II. Radiation Detection Instrumentation

- A. Use of radiation survey instruments
 - 1. Operation
 - 2. Calibration
 - 3. Limitation

Radiographer Training Outline

B. Survey techniques

C. Use of personnel monitoring devices

1. Film badges

3. Pocket dosimeters

2. TLDs

4. Alarms and rate meters

D. Radiation protection program & ALARA procedure

III. The Requirements of Pertinent Federal and State Regulations

IV. Radiographic Equipment to be Used

A. Remote handling equipment

B. Operation & control of exposure devices for sealed sources
(including pictures of dummy models of source assemblies)

C. Storage and transport containers & source changers

D. Operation & control of X-ray equipment*

E. Collimation devices

- Length of formal training = 40 hrs.
- *N/A for isotope-only applicants

NRC Information Notice 99-22

Effective Date for Radiographer Certification and Plans for Enforcement Discretion

June 25, 1999



Available at: <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>

NRC Inspection Procedures

87121

NRC INSPECTION MANUAL		IMNS/RGB
INSPECTION PROCEDURE 87121		
INDUSTRIAL RADIOGRAPHY PROGRAMS		
PROGRAM APPLICABILITY: 2800		
87121-01 INSPECTION OBJECTIVES		
01.01	To determine if licensed activities are being conducted in a manner that will protect the health and safety of workers and the general public.	
01.02	To determine if licensed programs are being conducted in accordance with U.S. Nuclear Regulatory Commission (NRC) requirements.	
87121-02 INSPECTION REQUIREMENTS		
The review of the licensed activities will be commensurate with the scope of the licensee's program. The inspector's evaluation of a licensee's program will be based on direct observation of work activities, interviews with workers, demonstrations by workers performing tasks regulated by NRC, and independent measurements of radiation conditions at the facility, rather than exclusive reliance on a review of records.		
The structure and the emphasis of the inspection will be on the following Focus Elements (FE) that describe the outcomes of an effective industrial radiography radiation safety program:		
02.01	FE-1: The licensee should control access to and prevent loss of licensed material so as to limit radiation exposure to workers and members of the public to values below 10 CFR Part 20 limits.	
02.02	FE-2: The licensee should maintain shielding of licensed materials in a manner consistent with operating procedures and design and performance criteria for devices and equipment.	
02.03	FE-3: The licensee should implement comprehensive safety measures to limit other hazards from compromising the safe use and storage of licensed material.	
Issue Date: 08/22/05		
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IP 87121		

86740

NRC INSPECTION MANUAL		NMSS
INSPECTION PROCEDURE 86740		
INSPECTION OF TRANSPORTATION ACTIVITIES		
PROGRAM APPLICABILITY: 2500, 2615, 2800, and 2800		
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Issue Date: 04/24/02		
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Available at: <http://www.nrc.gov/reading-rm/doc-collections/insp-17-manual/inspection-procedure/index.html>

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Questions?