2023

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Rules of
Governmental Agencies

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INTRODUCTION

The *Illinois Register* is the official state document for publishing public notice of rulemaking activity initiated by State governmental agencies. The table of contents is arranged categorically by rulemaking activity and alphabetically by agency within each category.

Rulemaking activity consists of proposed or adopted new rules; amendments to or repealers of existing rules; and rules promulgated by emergency or peremptory action. Executive Orders and Proclamations issued by the Governor; notices of public information required by State Statute; and activities (meeting agendas; Statements of Objection or Recommendation, etc.) of the Joint Committee on Administrative Rules (JCAR), a legislative oversight committee which monitors the rulemaking activities of State Agencies; is also published in the Register.

The Register is a weekly update of the Illinois Administrative Code (a compilation of the rules adopted by State agencies). The most recent edition of the Code, along with the Register, comprise the most current accounting of State agencies' rulemakings.

The *Illinois Register* is the property of the State of Illinois, granted by the authority of the Illinois Administrative Procedure Act [5 ILCS 100/1-1, et seq.].

ILLINOIS REGISTER PUBLICATION SCHEDULE FOR 2023

Issue#	Rules Due Date	Date of Issue
1	December 27, 2022	January 6, 2023
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1) Heading of the Part: Standards for Protection Against Radiation

2) Code Citation: 32 Ill. Adm. Code 340

3)

Section Numbers:	Adopted Actions:
340.40	Amendment
340.110	Amendment
340.730	Amendment
340.810	Amendment
340.830	Amendment
340.950	Amendment
340.960	Amendment
340.1010	Amendment
340.1055	Amendment
340.1060	Amendment
340.1130	Amendment
340.1160	Amendment
340.1210	Amendment
340.1220	Amendment
340.1270	Amendment
340.ILLUSTRATION A	Amendment

4) Statutory Authority: Implementing and authorized by Sections 10 and 11 of the Radiation Protection Act of 1990 [420 ILCS 40].

5) Effective Date of Rule: June 22, 2023

6) Does this rulemaking contain an automatic repeal date? No

7) Does this rulemaking contain incorporations by reference? No

8) A copy of the Adopted Rule, including any material incorporated by reference, is on file at the Agency's headquarters located at 1035 Outer Park Drive, Springfield, Illinois, and is available for public inspection.

9) Notice of Proposal Published in the *Illinois Register*: 47 Ill. Reg. 4094; March 31, 2023

10) Has JCAR issued a Statement of Objections to this rulemaking? No

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11) Differences between Proposal and Final Version: Grammatical changes were made.

12) Have all the changes agreed upon by the Agency and JCAR been made as indicated in the agreement letter issued by JCAR? Yes

13) Will this rulemaking replace an emergency rule currently in effect? No

14) Are there any rulemakings pending on this Part? No

15) Summary and Purpose of Rulemaking: The Agency is proposing amendments to Part 340 to update contact information for the Agency during reportable incidents and update language to meet compatibility with the U.S. Nuclear regulatory Commission in accordance with RATS ID 2020-3. In addition, the Agency is fixing technical errors and conflicts with other Agency rules, deleting burdensome requirements, and updating references.

16) Information and questions regarding these adopted rules shall be directed to:

Traci Burton
Paralegal Assistant
Illinois Emergency Management Agency
1035 Outer Park Drive
Springfield, Illinois 62704

(217) 720-8242
(217) 524-3698

The full text of the Adopted Amendments begin on the next page:

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TITLE 32: ENERGY
CHAPTER II: ILLINOIS EMERGENCY MANAGEMENT AGENCY
SUBCHAPTER b: RADIATION PROTECTION

PART 340
STANDARDS FOR PROTECTION AGAINST RADIATION

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Section

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Section

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INDIVIDUAL MEMBERS OF THE PUBLIC

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340.APPENDIX A Decontamination Guidelines
340.ILLUSTRATION A Radiation Symbol

AUTHORITY: Implementing and authorized by the Radiation Protection Act of 1990 [420 ILCS 40].

SOURCE: Filed April 24, 1970 by the Department of Public Health; transferred to the Department of Nuclear Safety by P.A. 81-1516, effective December 3, 1980; amended at 5 Ill. Reg. 9586, effective September 10, 1981; codified at 7 Ill. Reg. 16027; recodified at 10 Ill. Reg. 11273; amended at 10 Ill. Reg. 17538, effective September 25, 1986; amended at 16 Ill. Reg. 11538, effective July 7, 1992; old Part repealed, new Part adopted at 17 Ill. Reg. 18507, effective January 1, 1994; amended at 19 Ill. Reg. 8264, effective June 12, 1995; emergency amendment at 27, Ill. Reg. 17273, effective November 18, 2002, for a maximum of 150 days; amended at 27 Ill. Reg. 5445, effective March 17, 2003; recodified from the Department of Nuclear Safety to the Illinois Emergency Management Agency at 27 Ill. Reg. 13641; amended at 29 Ill. Reg. 20841, effective December 16, 2005; amended at 31 Ill. Reg. 11593, effective July 26, 2007; amended at 35 Ill. Reg. 934, effective December 30, 2010; amended at 39 Ill. Reg. 15728, effective November 24, 2015; amended at 45 Ill. Reg. 4895, effective April 1, 2021; amended at 47 Ill. Reg. 9163, effective June 22, 2023.

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SUBPART A: GENERAL PROVISIONS

Section 340.40 Implementation

~~a)~~Any existing license condition that is more restrictive than this Part remains in force until there is an amendment or renewal of the license.

~~b) If a license condition exempts a licensee from a provision of this Part in effect before January 1, 1994, it also exempts the licensee from the corresponding provision of this Part, as revised effective January 1, 1994, until there is an amendment or renewal of the license that modifies or removes the condition.~~

(Source: Amended at 47 Ill. Reg. 9163, effective June 22, 2023)

SUBPART B: RADIATION PROTECTION PROGRAMS

Section 340.110 Radiation Protection Programs

a) Each licensee or registrant shall develop, document, and implement a radiation protection program that ensures compliance with the provisions of this Part. (See Section 340.1120 ~~of this Part~~ for recordkeeping requirements relating to these programs.)

b) The licensee or registrant shall use, to the extent practicable, procedures and engineering controls based upon sound radiation protection principles to achieve occupational doses and public doses that are as low as is reasonably achievable (ALARA).

c) The licensee shall review, at least annually ~~intervals not to exceed 12 months~~, the radiation protection program content and implementation.

d) To implement the ALARA requirements of Section 340.110(b) ~~of this Part~~ and notwithstanding the requirements in Section 340.310 ~~of this Part~~, a constraint on air emissions of radioactive materials to the environment, excluding radon-222 and its daughters, shall be established by licensees so that the individual member of the public likely to receive the highest dose will not be expected to receive a total effective dose equivalent (TEDE) in excess of 0.1 mSv (10 mrem) per year from these emissions. If a licensee subject to this requirement exceeds this dose

constraint, the licensee shall report the excess as provided in Section 340.1230 ~~of this Part~~ and promptly take appropriate corrective action to ensure against recurrence.

e) The registrant shall review, at intervals not to exceed 1 inspection cycle as specified in 32 Ill. Adm. Code 320~~.10(c)~~, the radiation protection program content and implementation.

(Source: Amended at 47 Ill. Reg. 9163, effective June 22, 2023)

SUBPART H: RESPIRATORY PROTECTION AND CONTROLS TO RESTRICT INTERNAL EXPOSURE IN RESTRICTED AREAS

Section 340.730 Use of Individual Respiratory Protection Equipment

a) If the licensee assigns or permits the use of~~uses~~ respiratory protection equipment to limit the intake of radioactive material then~~intakes pursuant to Section 340.720 of this Part~~:

1) Except as provided in subsection (a)(2) ~~of this Section~~, the licensee shall use only respiratory protection equipment that is tested and certified ~~or had certification extended~~ by the National Institute for Occupational Safety and Health (NIOSH)~~and the Mine Safety and Health Administration (NIOSH/MSHA)~~.

2) The licensee may use equipment that has not been tested or certified by NIOSH~~NIOSH/MSHA, has not had certification extended by NIOSH/MSHA~~, or for which there is no schedule for testing or certification, provided ~~the licensee has submitted to the Agency and~~ the Agency has approved an application for authorized use of that equipment. The application shall include evidence~~, including a demonstration by testing, or a demonstration on the basis of test information,~~ that the material and performance characteristics of the equipment are capable of providing the proposed degree of protection under anticipated conditions of use. This shall be demonstrated either by licensee testing or on the basis of reliable test information.

3) The licensee shall implement and maintain a respiratory protection program that includes:~~meets the requirements of the Occupational Safety~~

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~~and Health Administration as set forth in 29 CFR 1910.134, effective April 18, 1998.~~

A) Air sampling sufficient to identify the potential hazard, permit proper equipment selection, and estimate doses.

B) Surveys and bioassays, as necessary, to evaluate actual intakes.

C) Testing of respirators for operability (user seal check for face sealing devices and functional check for others) immediately prior to each use.

D) Written procedures regarding:

i) Monitoring, including air sampling and bioassays;

ii) Supervision and training of respirator users;

iii) Fit testing;

iv) Respirator selection;

v) Breathing air quality;

vi) Inventory and control;

vii) Storage, issuance, maintenance, repair, testing, and quality assurance of respiratory protection equipment;

viii) Recordkeeping; and

ix) Limitations on periods of respirator use and relief from respirator use.

E) Determination by a physician that the individual user is medically fit to use respiratory protection equipment:

i) Before the initial fitting of a face sealing respirator;

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ii) Before the first field use of non-face sealing respirators; and

iii) Either every 12 months thereafter or periodically at a frequency determined by a physician.

F) Fit testing, with a fit factor > 10 times the APF for negative pressure devices, and a fit factor > 500 for any positive pressure, continuous flow, and pressure-demand devices, before the first field use of tight fitting, face-sealing respirators and periodically thereafter at a frequency not to exceed 1 year. Fit testing must be performed with the facepiece operating in the negative pressure mode.

4) The licensee shall advise each respirator user that the user may leave the area at any time for relief from respirator use in the event of equipment malfunction, physical or psychological distress, procedural or communication failure, significant deterioration of operating conditions, or any other conditions that might require such relief.

5) The licensee shall consider limitations appropriate to the type and mode of use. When selecting respiratory devices the licensee shall provide for vision correction, adequate communication, low temperature work environments, and the concurrent use of other safety or radiological protection equipment. The licensee shall use equipment in such a way as not to interfere with the proper operation of the respirator.

6) Standby rescue persons are required whenever one-piece atmosphere-supplying suits, or any combination of supplied air respiratory protection device and personnel protective equipment are used from which an unaided individual would have difficulty extricating himself or herself. The standby persons shall be equipped with respiratory protection devices or other apparatus appropriate for the potential hazards. The standby rescue persons shall observe or otherwise maintain continuous communication with the workers (visual, voice, signal line, telephone, radio, or other suitable means), and be immediately available to assist them in case of a failure of the air supply or for any other reason that requires relief from distress. A sufficient number of standby rescue

persons shall be immediately available to assist all users of this type of equipment and to provide effective emergency rescue if needed.

7) Atmosphere-supplying respirators must be supplied with respirable air of grade D quality or better as defined by the Compressed Gas Association in publication G-7.1, "Commodity Specification for Air", 1997 and included in the regulations of the Occupational Safety and Health Administration at 29 CFR 1910.134(i)(1)(ii)(A) through (E) (2019). Grade D quality air criteria include:

i) Oxygen content (v/v) of 19.5-23.5%;

ii) Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less;

iii) Carbon monoxide (CO) content of 10 ppm or less;

iv) Carbon dioxide content of 1,000 ppm or less; and

v) Lack of noticeable odor.

8) The licensee shall ensure that no objects, materials, or substances, such as facial hair, or any conditions that interfere with the face, facepiece seal, or valve function, under the control of the respirator wearer, are present between the skin of the respirator wearer's face and the sealing surface of a tight-fitting respirator facepiece.

b) When estimating the dose to individuals from intake of airborne radioactive materials, ~~the licensee may make allowance for respiratory protection equipment used to limit intakes pursuant to Section 340.720 of this Part. To estimate dose,~~ the concentration of radioactive material in the air that is inhaled when respirators are worn is initially assumed to be the ~~average~~ ambient concentration in air without respiratory~~respirator~~ protection, divided by the assigned protection factor. If the dose is later found to be greater than the~~initially~~ estimated dose, the corrected value shall be used; if the dose is later found to be less than the~~initially~~ estimated dose, the corrected value may be used. Protection factors for respirators are specified in Appendix A to 10 CFR 20 (1999)~~, effective January 1, 2004~~.

c) The licensee shall obtain authorization from the Agency before using

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assigned~~assigning respiratory~~ protection factors in excess of those specified in Appendix A to 10 CFR 20 (1999)~~, effective January 1, 2004, exclusive of subsequent amendments or editions~~. The Agency may~~shall~~ authorize a licensee to use higher assigned protection factors on receipt of an application that:

1) Describes the situation for which~~Demonstrates that~~ a need exists for higher protection factors; and

2) Demonstrates that the respiratory protection equipment provides these higher protection factors under the proposed conditions of use.

d) The Agency may impose restrictions in addition to the provisions of this Section, Section 340.720, and Appendix A to 10 CFR 20 (1999) in order to ensure the respiratory protection program of the licensee is adequate to limit doses to individuals from intakes of airborne radioactive materials consistent with maintaining total effective dose equivalent ALARA and limit the extent to which a licensee may use respiratory protection equipment instead of process or other engineering controls.~~The licensee shall notify the Agency, in writing, at least 30 days before the date that respiratory protection equipment is first used pursuant to the provisions of either subsection (a) or (b) of this Section.~~

(Source: Amended at 47 Ill. Reg. 9163, effective June 22, 2023)

SUBPART I: STORAGE AND CONTROL OF LICENSED OR REGISTERED SOURCES OF RADIATION

Section 340.810 Security and Control of Licensed or Registered Sources of Radiation

a) The licensee shall secure licensed radioactive material from unauthorized removal or access.

b) The licensee shall maintain constant surveillance~~,~~ and use devices or administrative procedures to prevent unauthorized use of licensed radioactive material that is in an unrestricted area and that is not in storage.

c) Unless otherwise specified in 32 Ill. Adm. Code 335, 350, or 351 or by the Agency, the licensee shall conduct a physical inventory at intervals not to exceed 6 months to account for each sealed source received and possessed under the license schedule item and shall maintain a record that includes the:~~of such~~

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~~inventories. The inventory records shall include the radionuclide, activity, activity assay date, manufacturer, model and serial number, location of the sealed source, date of the inventory and the identity of the individuals performing the inventory. 32 Ill. Adm. Code 350 and 351 allow for 3 months physical inventory.~~

1) Radionuclide;

2) Activity;

3) Activity assay date;

4) Manufacturer;

5) Model and serial number;

6) Location of the sealed source;

7) Date of the inventory; and

8) Identity of the individuals performing the inventory.

d) For sources that are removed from storage for use or transport, the record shall include:

1) The number and activity of sources removed from storage, the time and date they were removed from storage, the name of the individual who removed them from storage, and the location of use; and

2) The number and activity of sources returned to storage, the time and date they were returned to storage, and the name of the individual who returned them to storage.

e) Records of inventories shall be maintained for 5 years from the date of each inventory.

f) The registrant shall use devices or administrative procedures to prevent unauthorized use of registered radiation machines.

g) Security requirements for portable gauges. Each portable gauge licensee shall use a minimum of two independent physical controls that form tangible barriers to secure portable gauges from unauthorized removal whenever portable gauges are not under the control and constant surveillance of the licensee.

(Source: Amended at 47 Ill. Reg. 9163, effective June 22, 2023)

Section 340.830 Control of Volatiles and Gases

a) A licensee who uses or stores radioactive volatile materials or gases shall do so with a system that will keep airborne concentrations within the limits prescribed in this Part.

b) The system shall either be directly vented to the atmosphere through an air exhaust or provide for collection and decay or disposal of the volatile material or gas in a shielded container.

c) A licensee shall use or store radioactive gases only in rooms that are at negative pressure compared to surrounding rooms or hallways.

d) A licensee shall post, at the areas~~area~~ of use and~~or~~ storage, emergency procedures to be followed in the event of a gas spill.

e) In the event of evacuation because of a spill or leak, the licensee shall use a radiation detection survey instrument upon room re-entry to ensure radiation levels have returned to background levels.

f) A licensee shall check the operation of reusable collection systems monthly and measure the ventilation rates available in areas of use at intervals not to exceed 6 months. The licensee shall maintain a record of these checks and measurements for 5 years. The record shall include the model and serial number of the collection system, results of all checks recommended by the manufacturer of the collection system, the ventilation rates measured, the date of the checks and measurements, and the identity of the individual who performed the checks and measurements.

g) Contaminated charcoal trap filters, air handling systems, and respiratory equipment shall be disposed of in accordance with this Part.

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(Source: Amended at 47 Ill. Reg. 9163, effective June 22, 2023)

SUBPART J: PRECAUTIONARY PROCEDURES

Section 340.950 Exemptions to Labeling Requirements

A licensee is not required to label:

a) Containers holding licensed material in quantities less than the quantities listed in appendix C to 10 CFR 20, published at 60 Fed. Reg. 20186, April 25, 1995~~, exclusive of subsequent amendments or editions~~; or

b) Containers holding licensed material in concentrations less than those specified in Table 3 of appendix B to 10 CFR 20, published at 72 Fed. Reg. 55922, October 1, 2007~~, exclusive of subsequent amendments or editions~~; or

c) Containers attended by an individual who takes the precautions (e.g., controlling access) necessary to prevent the exposure of individuals in excess of the limits established by this Part; or

d) Containers when they are in transport, provided the containers are packaged and labeled in accordance with the regulations of the U.S. Department of Transportation; or

AGENCY NOTE: Labeling of packages containing radioactive materials is required by the U.S. Department of Transportation if the amount and type of radioactive material exceeds the limits for an excepted quantity or article as defined and limited by 49 CFR 173.403 and 173.421 through 173.424, revised October 1, 2008~~, exclusive of subsequent amendments or editions~~.

e) Containers that are accessible only to individuals authorized to handle or use them, or to work in the vicinity of the containers, if the contents are identified to these individuals by a readily available written record (examples of containers of this type are containers in locations such as water-filled canals, storage vaults or hot cells). The record shall be retained as long as the containers are in use for the purpose indicated on the record; or

f) Installed manufacturing or process equipment, such as piping and tanks.

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(Source: Amended at 47 Ill. Reg. 9163, effective June 22, 2023)

Section 340.960 Procedures for Receiving and Opening Packages

a) Each licensee who is authorized to receive a package containing quantities of radioactive material in excess of a Type A quantity, as defined in 49 CFR 173.403 and listed in 49 CFR 173.435 (2020), ~~32 Ill. Adm. Code 341.20, as listed in 49 CFR 173.435 published October 1, 1993, or as derived from 49 CFR 173.433 published October 1, 2004~~ shall:

1) Make arrangements to receive the package when the carrier offers it for delivery; or

2) Make arrangements to receive the notification of the arrival of the package at the carrier's terminal and to take possession of the package expeditiously.

b) Each licensee shall:

1) Monitor the external surfaces of a labeled package for radioactive contamination unless the package contains only radioactive material in the form of a gas or in special form radioactive material as defined in 32 Ill. Adm. Code 310.20;

AGENCY NOTE: Labeled means labeled with a Radioactive White I, Radioactive Yellow II or Radioactive Yellow III label as specified in U.S. Department of Transportation regulations, 49 CFR 172.403 and 172.436-440, published October 1, 2004.

2) Monitor the external surfaces of a labeled package for radiation levels unless the package contains quantities of radioactive material that are less than or equal to the Type A quantity; and

3) Monitor all packages known to contain radioactive material for radioactive contamination and radiation levels if there is evidence of degradation of package integrity, such as packages that are crushed, wet or damaged.

c) The licensee shall perform the monitoring required by subsection (b) ~~of this Section~~ as soon as practicable after receipt of the package, but not later than 3

hours after the package is received at the licensee's facility if it is received during the licensee's normal working hours or if there is evidence of degradation of package integrity, such as a package that is crushed, wet or damaged. If a package is received after working hours, and has no evidence of degradation of package integrity, the package shall be monitored no later than 3 hours from the beginning of the next working day.

d) The licensee shall immediately notify the final delivery carrier and the Agency by telephone at (217) 782-7860, and shall confirm the initial contact within 24 hours by overnight letter or telefacsimile to the Agency, when:

1) Removable radioactive surface contamination exceeds the limits of 32 Ill. Adm. Code 341.10 (49 CFR 173.443 (2014)); or

2) External radiation levels exceed the limits of 32 Ill. Adm. Code 341.10 (49 CFR 173.441 (2004)~~443~~).

e) Each licensee shall:

1) Establish, maintain, and retain written procedures for safely opening packages in which radioactive material is received; and

2) Ensure that the procedures are followed and that special instructions for the type of package being opened are adhered to.

f) Licensees transferring special form sources in licensee-owned or licensee-operated vehicles to and from a work site are exempt from the contamination monitoring requirements of subsection (b), but are not exempt from the survey requirement in subsection (b) for measuring radiation levels that is required to ensure that the source is still properly lodged in its shield.

(Source: Amended at 47 Ill. Reg. 9163, effective June 22, 2023)

SUBPART K: WASTE DISPOSAL

Section 340.1010 General Requirements

a) A licensee shall dispose of licensed material only:

1) By transfer to an authorized recipient as provided in Section 340.1060 or in 32 Ill. Adm. Code 330, 332 or 601, or to the U.S. Department of Energy; or

2) By release in effluents within the limits in Section 340.310; or

3) As authorized pursuant to Sections 340.1020, 340.1030, 340.1040, 340.1045, or 340.1050.

b) A person shall be specifically licensed by the Agency prior to receiving waste containing licensed material from any other point of generation for:

1) Storage for decay; or

2) Treatment prior to disposal; or

3) Treatment or disposal by incineration; or

4) Disposal at a land disposal facility licensed pursuant to 32 Ill. Adm. Code 601; or

5) Storage until transferred to a disposal facility authorized to receive the waste.

(Source: Amended at 47 Ill. Reg. 9163, effective June 22, 2023)

Section 340.1055 Radioactive Waste Characteristics

a) The following are minimum requirements for all classes of waste and are intended to facilitate handling and provide protection of health and safety of personnel at the disposal site.

1) Wastes shall be packaged in conformance with the conditions of the license issued to the site operator to which the waste will be shipped. Where the conditions of the site license are more restrictive than the provisions of this Part, the site license conditions shall govern.

2) Wastes shall not be packaged for disposal in cardboard or fiberboard boxes.

3) Liquid waste shall be packaged in sufficient absorbent material to absorb twice the volume of the liquid.

4) Solid waste containing liquid shall contain as little free-standing and non-corrosive liquid as is reasonably achievable, but in no case shall the liquid exceed 1% of the volume.

5) Waste shall not be readily capable of detonation or of explosive decomposition or reaction at normal pressures and temperatures, or of explosive reaction with water.

6) Waste shall not contain, or be capable of generating, quantities of toxic gases, vapors, or fumes harmful to persons transporting, handling, or disposing of the waste. This does not apply to radioactive gaseous waste packaged in accordance with subsection (a)(8) ~~of this Section~~.

7) Waste must not be pyrophoric. Pyrophoric materials contained in wastes shall be treated, prepared, and packaged to be nonflammable. ~~(See 32 Ill. Adm. Code 601 for definition of pyrophoric.)~~

8) Wastes in a gaseous form shall be packaged at an absolute pressure that does not exceed 1.5 atmospheres at 20°C (68°F). Total activity shall not exceed 100 Ci per container.

9) Wastes containing hazardous, biological, pathogenic, or infectious material shall be treated to reduce to the maximum extent practicable the potential hazard from the non-radiological materials.

b) The following requirements are intended to provide stability of the waste. Stability is intended to ensure that the waste does not degrade and affect overall stability of the site through slumping, collapse, or other failure of the disposal unit and thereby lead to water infiltration. Stability is also a factor in limiting exposure to an inadvertent intruder, since it provides a recognizable and nondispersible waste.

1) Waste shall have structural stability. A structurally stable waste form will generally maintain its physical dimensions and its form, under the expected disposal conditions such as weight of overburden and

compaction equipment, the presence of moisture, and microbial activity, and internal factors such as radiation effects and chemical changes. Structural stability can be provided by the waste form itself, processing the waste to a stable form, or placing the waste in a disposal container or structure that provides stability after disposal.

2) Notwithstanding the provisions in subsections (a)(3) and (a)(4) ~~of this Section~~, liquid wastes, or wastes containing liquid, shall be converted into a form that contains as little free-standing and non-corrosive liquid as is reasonably achievable, but in no case shall the liquid exceed 1% of the volume of the waste when the waste is in a disposal container designed to ensure stability, or 0.5% of the volume of the waste for waste processed to a stable form.

3) Void spaces within the waste and between the waste and its package shall be reduced to the extent practicable.

(Source: Amended at 47 Ill. Reg. 9163, effective June 22, 2023)

Section 340.1060 Transfer for Disposal and Manifests

a) Each licensee who transports or offers for transportation low-level radioactive waste intended for ultimate disposal at a licensed low-level radioactive waste disposal facility shall prepare a manifest reflecting information requested on the applicable NRC Forms 540 (Uniform Low-Level Radioactive Waste Manifest ~~(~~Shipping Paper~~)~~) and 541 (Uniform Low-Level Radioactive Waste Manifest ~~(~~Container and Waste Description~~)~~) and, if necessary, on an applicable NRC Form 542 (Uniform Low-Level Radioactive Waste Manifest ~~(~~Manifest Index and Regional Compact Tabulation~~)~~).

AGENCY NOTE: For guidance in completing these forms, refer to the instructions that accompany the forms. NRC Forms 540, 540A, 541, 541A, 542, and 542A and the accompanying written instructions may be obtained from the Office of the Chief Information Officer, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, telephone (301) 415-5877, or http://www.nrc.gov.

b) NRC Forms 540 and 540A shall be completed and shall physically accompany each low-level radioactive waste shipment. Each licensee shipping low-level radioactive waste shall transfer manifest information to the consignee.

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c) Upon agreement between the shipper and the consignee, NRC Forms 541, 541A, 542, or 542A may be completed, transmitted, and stored in electronic media with the capability of producing legible, accurate, and complete records on the respective forms. Copies of manifests required by this Section may be legible carbon copies, photocopies, or computer printouts that reproduce the data in the format of the uniform manifest.

d) Licensees are exempt from the manifesting requirements of this Section when shipping:

1) Low-level radioactive waste for processing and when they expect its return (i.e., for storage under their license) prior to disposal at a licensed disposal facility;

2) Low-level radioactive waste that is being returned to the licensee who is the waste generator; or

3) Radioactively contaminated material to a waste processor that becomes the processor's residual waste.

e) Each licensee shipping low-level radioactive waste shall also comply with the reporting requirements specified in 32 Ill. Adm. Code 609.

f) Each shipper of radioactive waste shall provide the following information regarding the waste shipment on the uniform manifest:

1) The name, facility address, and telephone number of the licensee shipping the waste;

2) An explicit declaration indicating whether the shipper is acting as a waste generator, collector or processor, or a combination of these identifiers, for purposes of the manifested shipment;

3) The name, address, and telephone number, or the name and USEPA identification number, for the carrier transporting the waste;

4) The date of the waste shipment;

5) The total number of packages/disposal containers;

6) The total disposal volume and disposal weight in the shipment;

7) The total radionuclide activity in the shipment;

8) The activity of each of the radionuclides H-3, C-14, Tc-99 and I-129 contained in the shipment; and

9) The total masses of U-233, U-235, and plutonium in special nuclear material, and the total mass of uranium and thorium in source material.

AGENCY NOTE: The reporting requirements of the uniform manifest meet the reporting requirements of USDOT for the shipments of waste. Therefore, no additional USDOT~~DOT~~ forms are required for shipments of low-level radioactive waste. However, the uniform manifest does not meet the reporting requirements of USEPA for the shipment of hazardous, medical, or other waste. Any additional USEPA requirements shall be met by using an additional USEPA manifest. In addition, the uniform manifest reporting requirements do not meet the tracking requirements of 32 Ill. Adm. Code 609.

g) For waste shipments in disposal containers, each shipper shall provide the following information on the uniform manifest regarding the waste and each disposal container of waste in the shipment:

1) An alphabetic or numeric identification that identifies each disposal container in the shipment;

2) A physical description of the disposal container, including the manufacturer and model of any high integrity container;

3) The volume displaced by the disposal container;

4) The gross weight of the disposal container, including the waste;

5) For waste consigned to a disposal facility, the maximum radiation level at the surface of each disposal container;

6) A physical and chemical description of the waste;

7) The total weight percentage of chelating agent for any waste containing more than 0.1 percent chelating agent by weight, plus the identity of the principal chelating agent;

8) The approximate volume of waste within a container;

9) The sorbing or solidification media, if any, and the identity of the manufacturer of the solidification media and brand name;

10) The identities and activities of individual radionuclides contained in each container, the masses of U-233, U-235, and plutonium in special nuclear material, and the masses of uranium and thorium in source material. For discrete waste types (i.e., activated materials, contaminated equipment, mechanical filters, sealed sources~~source~~/devices, and wastes in solidification/ stabilization media), the identities and activities of individual radionuclides associated with or contained in~~on~~ these waste types within a disposal container shall be reported;

11) The total radioactivity within each container; and

12) For wastes consigned to a disposal facility, the classification of the waste shall be identified on the manifest pursuant to Section 340.1052. Waste not meeting the structural stability requirements of Section 340.1055(b) shall also be identified on the manifest.

h) For waste shipments delivered without a disposal container, the shipper of the radioactive waste shall provide the following information on the uniform manifest:

1) The approximate volume and weight of the waste;

2) A physical and chemical description of the waste;

3) The total weight percentage of chelating agent for any waste containing more than 0.1 percent chelating agent by weight, plus the identity of the principal chelating agent;

4) For wastes consigned to a disposal facility, the classification of the waste shall be identified on the manifest pursuant to Section 340.1052. Waste not meeting the structural stability requirements of Section 340.1055(b) shall also be identified on the manifest;

5) The identities and activities of individual radionuclides contained in the waste, the masses of U-233, U-235, and plutonium in special nuclear material, and the masses of uranium and thorium in source material; and

6) For waste consigned to a disposal facility, the maximum radiation levels at the surface of the waste.

i) For waste comprised of mixtures of waste originating from different waste generators, the shipper shall provide the following information on the uniform manifest:

AGENCY NOTE: The origin of the low-level radioactive waste resulting from a processor's activities may be attributable to one or more "waste generators" as defined in this Part.

1) For homogeneous mixtures of waste, such as incinerator ash, provide the waste description applicable to the mixture and the volume of the waste attributed to each waste generator.

2) For heterogeneous mixtures of waste, such as the combined products from a large compactor, identify each generator contributing waste to the disposal container, and for discrete waste types (i.e., activated materials, contaminated equipment, mechanical filters, sealed source/devices and wastes in solidification/stabilization media), the identities and activities of individual radionuclides contained on these waste types within the disposal container. For each waste generator, provide the following:

A) The volume of waste;

B) A physical and chemical description of the waste, including the solidification agent, if any;

C) The total weight percentage of chelating agents for any waste containing more than 0.1 percent chelating agent by weight, plus the identity of the principal chelating agent;

D) The sorbing or solidification media, if any, and the identity of the solidification media vendor and brand name if the media is claimed to meet stability requirements in Section 340.1055(b); and

E) Radionuclide identities and activities contained in the waste, the masses of U-233, U-235, and plutonium in special nuclear material, and the masses of uranium and thorium in source material if contained in the waste.

j) An authorized representative of the licensee shall certify, by signing and dating the shipment manifest, that the transported materials are properly classified, described, packaged, marked, and labeled and are in proper condition for transportation according to the requirements of USDOT regulations and this Part. A collector, in signing the certification, is certifying that nothing has been done to the collected waste that would invalidate the waste generator's certification.

k) Any licensee who transfers radioactive waste to a land disposal facility or a licensed waste collector shall comply with the requirements in subsections (k)(1) through (9). Any licensee who transfers waste to a licensed waste processor for waste treatment or repackaging shall comply with the requirements of subsections (k)(4) through (9). The licensee shall:

1) Prepare all wastes so that the waste is classified according to Section 340.1052 and meets the waste characteristics requirements in Section 340.1055;

2) Label each disposal container (or transport package if potential radiation hazards preclude labeling of the individual disposal container) of waste to identify whether it is Class A waste, Class B waste, Class C waste, or greater than Class C waste, in accordance with Section 340.1052;

3) Conduct a quality assurance program to assure compliance with Sections 340.1052 and 340.1055 (the program shall include management evaluation of audits);

4) Prepare the appropriate NRC Uniform Low-Level Radioactive Waste Manifest form as required by this Part;

5) Forward a copy or electronically transfer the Uniform Low-Level Radioactive Waste Manifest to the intended consignee so that receipt of the manifest precedes the low-level radioactive waste shipment, or the manifest is delivered to the consignee with the waste at the time the waste is transferred to the consignee. Using either or both of these methods is acceptable;

6) Include NRC Form 540 (and NRC Form 540A, if required) with the shipment regardless of the option chosen in subsection (k)(5);

7) Receive acknowledgement of the receipt of the shipment in the form of a signed copy of NRC Form 540;

8) Retain a copy of or electronically store the Uniform Low-Level Radioactive Waste Manifest and documentation of acknowledgement of receipt as the record of transfer of licensed material as required by the Agency; and

9) For any shipments or any part of a shipment for which acknowledgement of receipt has not been received within the times set forth in this Part, conduct an investigation in accordance with Section 340.1270.

l) Any waste collector licensee who handles only prepackaged waste shall comply with subsections (l)(1) and (2) and (l)(7) through (12). Any licensed waste processor who treats or repackages waste shall comply with subsections (l)(1) and (l)(3) through (12).

1) Acknowledge receipt of the waste from the shipper within one week after receipt by returning a signed copy of NRC Form 540 to the shipper;

2) Prepare a new manifest to reflect consolidated shipments that meet the requirements of this Part. The waste collector shall ensure that, for each container of waste in the shipment, the manifest identifies the generator of that container of waste;

3) Prepare a new manifest that meets the requirements of this Part. Preparation of the new manifest reflects that the processor is responsible for meeting these requirements. For each container of waste in the shipment, the manifest shall identify the waste generators, the preprocessed waste volume, and the other information required in subsection (i);

4) Prepare all wastes so that the waste is classified according to Section 340.1052 and meets the waste characteristics requirements in Section 340.1055;

5) Label each package of waste to identify whether it is Class A waste, Class B waste, or Class C waste, in accordance with Sections 340.1052 and 340.1055;

6) Conduct a quality assurance program to assure compliance with Sections 340.1052 and 340.1055 (the program shall include management evaluation of audits);

7) Forward a copy or electronically transfer the Uniform Low-Level Radioactive Waste Manifest to the intended consignee so that receipt of the manifest precedes the low-level radioactive waste shipment, or the manifest is delivered to the consignee with the waste at the time the waste is transferred to the consignee. Using either or both of these methods is acceptable;

8) Include NRC Form 540 (and NRC Form 540A, if required) with the shipment regardless of the option chosen in subsection (l)(7);

9) Receive acknowledgement of the receipt of the shipment in the form of a signed copy of NRC Form 540;

10) Retain a copy of or electronically store the Uniform Low-Level Radioactive Waste Manifest and documentation of acknowledgement of receipt as the record of transfer of licensed material as required by the Agency;

11) For any shipments or any part of a shipment for which acknowledgement of receipt has not been received within the times set forth in this Part, conduct an investigation in accordance with Section 340.1270; and

12) Notify the shipper and the Agency when any shipment or part of a shipment has not arrived within 60 days after receipt of an advance manifest, unless notified by the shipper that the shipment has been cancelled.

m) Any licensed land disposal facility operator shall:

1) Acknowledge receipt of low-level radioactive waste within 1 week after receipt by returning, at a minimum, a signed copy of NRC Form 540 to the shipper. The shipper to be notified is the licensee who last possessed the waste and transferred the waste to the operator. If any discrepancy exists between materials listed on the Uniform Low-Level Radioactive Waste Manifest and materials received, copies or electronic transfer of the affected forms shall be returned indicating the discrepancy;

2) Maintain copies of all completed manifests ~~and electronically store the information required by 32 Ill. Adm. Code 606.40~~ until the Agency terminates the license; and

3) Notify the shipper and the Agency when any shipment or part of a shipment has not arrived within 60 days after receipt of an advance manifest, unless notified by the shipper that the shipment has been cancelled.

(Source: Amended at 47 Ill. Reg. 9163, effective June 22, 2023)

SUBPART L: RECORDS

Section 340.1130 Records of Surveys and Calibrations

a) Each licensee or registrant shall maintain records showing the results of surveys and calibrations required by Sections 340.510 and 340.960(b). The licensee or registrant shall retain these records for 5 years after the record is made.

1) Records of surveys shall include:

A) The location and date of the survey and the model and serial number of the instrument used to perform the survey;

B) The identity of the individual performing the survey; and

C) The results of the survey and any corrective actions that were taken as a result.

2) For each survey instrument calibrated in accordance with Section 340.510(b), the licensee shall maintain the following records:

A) A copy of the licensee's own calibration procedures or a copy of a license issued by the Agency, the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State authorizing the person that performed the calibrations to perform calibrations as a customer service; and

B) A record identifying the manufacturer, model, and serial number of the instrument that was calibrated, the calibration results, the identity of the individual who performed the calibration, and the date of the calibration.

3) Each licensee authorized to perform instrument calibrations shall maintain a copy of each calibration document created in accordance with subsection (a)(2)(B) and a copy of the procedures followed to perform that calibration.

4) The licensee shall retain a record of each check required in Section 340.510(c)~~340.540(a)~~ for 5 years. ~~The record shall include the manufacturer, model and serial number of the instrument being checked, a description of the source used, the radiation level indicated by the instrument being checked, the identity of the individual who performed the check, and the date of the check.~~

b) The licensee or registrant shall retain each of the following records until the Agency terminates each license or registration for which the record is required:

1) Records of the results of surveys to determine the dose from external

sources of radiation that are used, in the absence of or in combination with individual monitoring data, in the assessment of individual dose equivalents;

2) Records of the results of measurements and calculations that are used to determine individual intakes of radioactive material and that are used in the assessment of internal dose;

3) Records showing the results of air sampling, surveys, and bioassays required pursuant to Section 340.730(a)(3)(A) and (B);

4) Records of the results of measurements and calculations used to evaluate the release of radioactive effluents to the environment; and

5) Records from surveys describing the location and amount of subsurface residual radioactivity identified at the site.

(Source: Amended at 47 Ill. Reg. 9163, effective June 22, 2023)

Section 340.1160 Records of Individual Monitoring Results

a) Recordkeeping Requirement. Each licensee or registrant shall maintain records of doses received by all individuals for whom monitoring was required pursuant to Section 340.520 ~~of this Part~~, and records of doses received during planned special exposures, accidents, and emergency conditions. These records shall include, when applicable:

1) The deep dose equivalent to the whole body, lens dose equivalent, shallow dose equivalent to the skin, and shallow dose equivalent to the extremities;

2) The estimated intake of radionuclides (see Section 340.220 ~~of this Part~~);

3) The committed effective dose equivalent assigned to the intake of radionuclides;

4) The specific information used to calculate the committed effective dose equivalent pursuant to Section 340.240(c) ~~of this Part~~;

5) The total effective dose equivalent when required by Section 340.220 ~~of~~

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~~this Part~~; and

6) The total of the deep dose equivalent and the committed dose equivalent to the organ receiving the highest total dose.

~~AGENCY NOTE: Assessments of dose equivalent and records made using units in effect before January 1, 1994, need not be changed.~~

b) Recordkeeping Frequency. The licensee or registrant shall make entries of the records specified in subsection (a) ~~of this Section~~ at least annually~~intervals not to exceed 1 year~~.

c) Recordkeeping Format. The licensee or registrant shall maintain the records specified in subsection (a) ~~of this Section~~ on NRC Form 5~~Agency forms IL 473-0298 (IDNS Form 4) and IL 473-0299 (IDNS Form 5), as applicable~~, in accordance with the instructions for NRC Form 5~~the forms~~, or in clear and legible records containing all the information required by NRC Form 5~~the forms~~.

d) The licensee or registrant shall maintain the records of dose to an embryo/fetus with the records of dose to the declared pregnant woman. The declaration of pregnancy, and the estimated date of conception, shall also be kept on file, but may be maintained separately from the dose records.

e) The licensee or registrant shall retain each required form or record until the Agency terminates each license or registration for which the record is required.

~~f) Upon termination of the license or registration, the records of doses received by individuals shall be transferred to the Agency.~~

(Source: Amended at 47 Ill. Reg. 9163, effective June 22, 2023)

SUBPART M: REPORTS AND NOTIFICATIONS

Section 340.1210 Reports of Stolen, Lost, or Missing Sources of Radiation

a) Telephone Reports. Each licensee or registrant shall report to the Agency by telephone at (217) 782-7860 each stolen, lost, or missing source of radiation immediately after its absence becomes known to the licensee or registrant. This requirement does not apply to sources of radiation that are not required to be

licensed or registered.

b) Written Reports. Each licensee or registrant required to make a report pursuant to subsection (a) ~~of this Section~~ shall, within 30 days after making the telephone report, make a written report to the Agency setting forth the following information:

1) A description of the source of radiation involved, including for radioactive material, the kind, quantity, and chemical and physical form; and, for radiation machines, the type of unit, the manufacturer, model, and serial number;

2) A description of the circumstances under which the loss or theft occurred;

3) A statement of disposition, or probable disposition, of the source of radiation involved;

4) Exposures of individuals to radiation, circumstances under which the exposures occurred, and the possible total effective dose equivalent to persons in unrestricted areas;

5) Actions that have been taken, or will be taken, to recover the source of radiation; and

6) Procedures or measures that have been, or will be, adopted to ensure against a recurrence of the theft or loss of sources of radiation.

c) Subsequent to filing the written report, the licensee or registrant shall also report any additional substantive information on the loss or theft within 30 days after the licensee or registrant learns of such information.

d) The licensee or registrant shall prepare any report filed with the Agency pursuant to this Section so that names of individuals who may have received exposure to radiation are stated in a separate and detachable portion of the report.

(Source: Amended at 47 Ill. Reg. 9163, effective June 22, 2023)

Section 340.1220 Notification of Incidents

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a) Immediate Notification. Notwithstanding any other requirements for notification, each licensee or registrant shall immediately report to the Agency discovery of an event that prevents immediate protective actions necessary to avoid releases of radioactive material or doses in excess of the regulatory limits, or each event involving a source of radiation possessed by the licensee or registrant that may have caused or threatens to cause any of the following conditions:

1) An individual to receive:

A) A total effective dose equivalent of 0.25 Sv (25 rem) or more; or

B) A lens dose equivalent of 0.75 Sv (75 rem) or more; or

C) A shallow dose equivalent to the skin or extremities or a total organ dose equivalent of 2.5 Gy (250 rad) or more; or

2) The release of radioactive material, inside or outside of a restricted area, so that, had an individual been present for 24 hours, the individual could have received an intake five times the ALI, except the provisions of this subsection (a) do not apply to locations where personnel are not normally stationed during routine operations, such as hot cells or process enclosures.

b) 24 Hour Notification. Each licensee or registrant shall, within 24 hours of discovery of the event, report to the Agency each event involving loss of control of a licensed or registered source of radiation possessed by the licensee or registrant that may have caused, or threatens to cause, any of the following conditions:

1) An individual to receive, in a period of 24 hours:

A) A total effective dose equivalent exceeding 0.05 Sv (5 rem); or

B) A lens dose equivalent exceeding 0.15 Sv (15 rem); or

C) A shallow dose equivalent to the skin or extremities or a total organ dose equivalent exceeding 0.5 Sv (50 rem); or

2) The release of radioactive material, inside or outside of a restricted area,

so that, had an individual been present for 24 hours, the individual could have received an intake in excess of one occupational ALI, except the provisions of this subsection (b) do not apply to locations where personnel are not normally stationed during routine operations, such as hot cells or process enclosures.

c) Additional 24 Hour Notifications for Licensees. Each licensee shall notify the Agency within 24 hours after the discovery of any of the following events involving radioactive material:

1) An unplanned contamination event that:

A) Requires access to the contaminated area by workers or the public to be restricted for more than 24 hours by imposing radiological controls in addition to those established by the licensee prior to the event or by prohibiting entry into the area;

B) Involves a quantity of material greater than five times the lowest annual limit on intake specified in 10 CFR 20, appendix B, published at 72 Fed. Reg. 55922, October 1, 2007, for the material; and

C) Results in access to the area being restricted for a reason other than to ~~either~~ comply with operating procedures established by the licensee~~,~~ or to allow radionuclides with a half-life of less than 24 hours to decay prior to decontamination.

2) An event in which equipment is disabled or fails to function as designated when:

A) The equipment is required by regulation or license condition to prevent releases or doses exceeding regulatory limits, or to mitigate the consequences of an accident;

B) The equipment is required to be available and operable when it is disabled or fails to function; and

C) No redundant equipment is available and operable to perform the required safety function.

3) An event that requires unplanned medical treatment at a medical facility of an individual with radioactive contamination on the individual's clothing or body.

4) An unplanned fire or explosion damaging any licensed material or any device, container, or equipment containing licensed material when:

A) The quantity of material involved is greater than five times the lowest annual limit on intake specified in 10 CFR 20, appendix B, published at 72 Fed. Reg. 55922, October 1, 2007, for the material; and

B) The damage affects the integrity of the licensed material or its container.

d) Licensees or registrants shall make the reports required by subsections (a) through (c) by initial contact by telephone to the Agency at (217) 782-7860 and shall confirm the initial contact within 24 hours by overnight letter or telefacsimile to the Agency.

e) The licensee or registrant shall prepare each written report filed with the Agency pursuant to this Section so that names of individuals who have received exposure to sources of radiation are stated in a separate and detachable portion of the report.

f) The provisions of this Section do not apply to doses that result from planned special exposures, provided such doses are within the limits for planned special exposures and are reported pursuant to Section 340.1240.

(Source: Amended at 47 Ill. Reg. 9163, effective June 22, 2023)

Section 340.1270 Reports of Missing Waste Shipments

Any shipment or part of a shipment for which acknowledgement is not received within the times set forth in Subpart K ~~of this Part~~ shall:

a) Be investigated by the shipper if the shipper has not received notification or receipt within 20 days after transfer; and

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b) Be traced and reported. The investigation shall include tracing the shipment and each~~filing a report with the Agency. Each~~ licensee who conducts a trace investigation shall file a written report with the Agency within 2 weeks after completion of the investigation.

(Source: Amended at 47 Ill. Reg. 9163, effective June 22, 2023)

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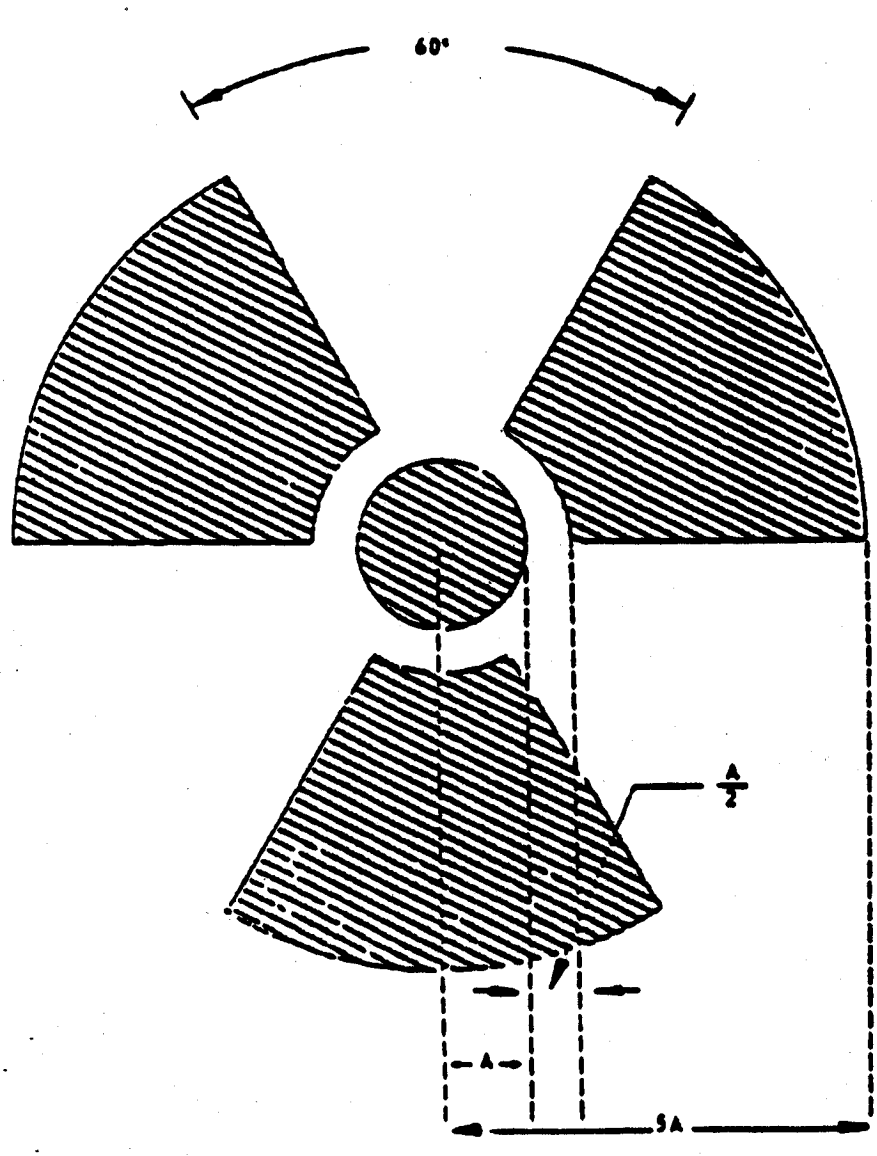
Section 340.ILLUSTRATION A Radiation Symbol

1. Cross-hatched area is to be magenta, ~~or~~ purple, or black.

2. Background is to be yellow.



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(Source: Amended at 47 Ill. Reg. 9163, effective June 22, 2023)

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1) Heading of the Part: Licenses and Radiation Safety Requirements for Irradiators

2) Code Citation: 32 Ill. Adm. Code 346

3)

Section Numbers:	Adopted Actions:
346.40	Amendment
346.150	Amendment
346.230	Amendment
346.250	Amendment
346.330	Amendment
346.350	Amendment
346.390	Amendment
346.510	Amendment
346.550	Amendment
346.570	Amendment
346.590	Amendment
346.670	Amendment
346.810	Amendment
346.830	Amendment

4) Statutory Authority: Implementing and authorized by Section 10 of the Radiation Protection Act of 1990 [420 ILCS 40].

5) Effective Date of Rule: June 22, 2023

6) Does this rulemaking contain an automatic repeal date? No

7) Does this rulemaking contain incorporations by reference? No

8) A copy of the Adopted Rule, including any material incorporated by reference, is on file at the Agency's headquarters located at 1035 Outer Park Drive, Springfield, Illinois, and is available for public inspection.

9) Notice of Proposal Published in the *Illinois Register*: 47 Ill. Reg. 4133; March 31, 2023

10) Has JCAR issued a Statement of Objections to this rulemaking? No

11) Differences between Proposal and Final Version:

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In Section 346.590 c) deleted both "NRC"

12) Have all the changes agreed upon by the Agency and JCAR been made as indicated in the agreement letter issued by JCAR? Yes

13) Will this rulemaking replace an emergency rule currently in effect? No

14) Are there any rulemakings pending on this Part? No

15) Summary and Purpose of Rulemaking: The Agency is proposing amendments to Part 340 to update contact information for the Agency during reportable incidents and update language to meet compatibility with the U.S. Nuclear regulatory Commission in accordance with RATS ID 2020-3. In addition, the Agency is fixing technical errors and conflicts with other Agency rules, deleting burdensome requirements, and updating references.

16) Information and questions regarding these adopted rules shall be directed to:

Traci Burton
Paralegal Assistant
Illinois Emergency Management Agency
1035 Outer Park Drive
Springfield, Illinois 62704

(217) 720-8242
(217) 524-3698

The full text of the Adopted Amendments begin on the next page:

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TITLE 32: ENERGY
CHAPTER II: ILLINOIS EMERGENCY MANAGEMENT AGENCY
SUBCHAPTER b: RADIATION PROTECTION

PART 346
LICENSES AND RADIATION SAFETY REQUIREMENTS FOR IRRADIATORS

SUBPART A: GENERAL PROVISIONS

SUBPART B: SPECIFIC LICENSING REQUIREMENTS

SUBPART C: DESIGN AND PERFORMANCE REQUIREMENTS OF IRRADIATORS

SUBPART D: OPERATION OF IRRADIATORS

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SUBPART E: RECORDS

AUTHORITY: Implementing and authorized by the Radiation Protection Act of 1990 [420 ILCS 40/10].

SOURCE: Adopted at 29 Ill. Reg. 20933, effective December 16, 2005; amended at 35 Ill. Reg. 974, effective December 30, 2010; amended at 38 Ill. Reg. 21467, effective October 31, 2014; amended at 47 Ill. Reg. 9201, effective June 22, 2023.

SUBPART A: GENERAL PROVISIONS

Section 346.40 Definitions

~~"Annually" means at intervals not to exceed 12 months.~~

"Doubly encapsulated sealed source" means a sealed source in which the radioactive material is sealed within a capsule and that capsule is sealed within another capsule.

"Irradiator" means a facility that uses radioactive sealed sources for the irradiation of objects or materials and in which radiation dose rates exceeding 5 grays (500 rads) per hour exist at 1 meter from the sealed radioactive sources in air or water, as applicable to the irradiator type, but does not include irradiators in which both

the sealed source and the area subject to irradiation are contained within a device and are not accessible to personnel.

"Irradiator operator" means an individual who has successfully completed the training and testing described in Section 346.510 ~~of this Part~~ and is authorized by the terms of the license to operate the irradiator without a supervisor present.

"Panoramic dry-source-storage irradiator" means an irradiator in which the irradiations occur in air in areas potentially accessible to personnel and in which sources are stored in shields made of solid materials. The term includes beam-type dry-source-storage irradiators in which only a narrow beam of radiation is produced for performing irradiations.

"Panoramic irradiator" means an irradiator in which the irradiations are done in air and in areas potentially accessible to personnel. The term includes beam-type irradiators.

"Panoramic wet-source-storage irradiator" means an irradiator in which the irradiations occur in air in areas potentially accessible to personnel and in which the sources are stored under water in a storage pool.

"Pool irradiator" means any irradiator at which the sources are stored or used in a pool of water, including panoramic wet-source-storage irradiators and underwater irradiators.

"Product conveyor system" means a system for moving the product to be irradiated to, from and within the area where irradiation takes place.

"Radiation room" means a shielded room in which irradiations take place. Underwater irradiators do not have radiation rooms.

"Sealed source" means any radioactive material that is used as a source of radiation and is encased in a capsule designed to prevent leakage or escape of the radioactive material.

"Seismic area" means any area where the probability of a horizontal acceleration in rock of more than~~then~~ 0.3 times the acceleration of gravity in 250 years is greater than 10 percent, as designated by the U.S. Geological Survey.

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"Underwater irradiator" means an irradiator in which the sources always remain shielded under water and personnel do not have access to the sealed sources or the space subject to irradiation without entering the pool.

(Source: Amended at 47 Ill. Reg. 9201, effective June 22, 2023)

SUBPART B: SPECIFIC LICENSING REQUIREMENTS

Section 346.150 Commencement~~Start~~ of Construction

Commencement of~~The applicant may not begin~~ construction of a new irradiator may not occur prior to submission to the Agency of an application for a license for the irradiator. As used in this Section, the term "construction" is defined in 32 Ill. Adm. Code 310.20. Any activities undertaken prior to the issuance of a license are entirely at the risk of the applicant and have no bearing on the issuance of a license with respect to the requirements of the Radiation Protection Act of 1990 and regulations and orders issued under the Act. Commencement of construction as defined in 32 Ill. Adm. Code 310.20 may include non-construction activities if the activity has a reasonable nexus to radiological safety and security.

(Source: Amended at 47 Ill. Reg. 9201, effective June 22, 2023)

SUBPART C: DESIGN AND PERFORMANCE REQUIREMENTS OF IRRADIATORS

Section 346.230 Access Control

a) Each entrance to a radiation room at a panoramic irradiator shall have a door or other physical barrier to prevent inadvertent entry of personnel if the sources are not in the shielded position. Product conveyer systems may serve as barriers as long as they reliably and consistently function as a barrier. It shall not be possible to move the sources out of their shielded position if the door or barrier is open. Opening the door or barrier while the sources are exposed shall cause the sources to return promptly to their shielded position. The personnel entrance door or barrier shall have a lock that is operated by the same key used to move the sources. The doors and barriers shall not prevent any person in the radiation room from leaving.

b) In addition, each entrance to a radiation room at a panoramic irradiator shall have an independent backup access control to detect personnel entry while the sources are exposed. Detection of entry while the sources are exposed shall cause the

sources to return to their fully shielded position and shall also activate a visible and audible alarm to make the person entering the room aware of the hazard. The alarm shall also alert at least one other person who is onsite of the entry. That person shall be trained on how to respond to the alarm and prepared to promptly render or summon assistance.

c) A radiation monitor shall be provided to detect the presence of high radiation levels in the radiation room of a panoramic irradiator before personnel entry. The monitor shall be integrated with a personnel access door to prevent room access when radiation levels are high. Attempted personnel entry while the monitor measures high radiation levels shall activate the alarm described in subsection (b) ~~of this Section~~. The monitor may be located in the entrance (normally referred to as the maze) but not in the direct radiation beam.

d) Before the sources move from their shielded position in a panoramic irradiator, the source control shall automatically activate conspicuous visible and audible alarms to alert personnel in the radiation room that the sources will be moved from their shielded position. The alarms shall give personnel enough time to leave the room before the sources leave the shielded position.

e) Each radiation room at a panoramic irradiator shall have a clearly visible and readily accessible control that would allow a person in the room to make the sources return to their fully shielded position.

f) Each radiation room of a panoramic irradiator shall contain a control that prevents the sources from moving from the shielded positions unless the control has been activated and the door or barrier to the radiation room has been closed within a pre-set time after activation of the control.

g) Each entrance to the radiation room of a panoramic irradiator and each entrance to the area within the personnel access barrier of an underwater irradiator shall be posted as required by 32 Ill. Adm. Code 340.920. Radiation postings for panoramic irradiators shall comply with the posting requirements of 32 Ill. Adm. Code 340.920, except that signs may be removed, covered, or otherwise made inoperative when the sources are fully shielded.

h) If the radiation room of a panoramic irradiator has roof plugs or other movable shielding, it shall not be possible to operate the irradiator unless the shielding is in its proper location. This requirement may be met by interlocks that prevent

operation if shielding is not placed properly or by an operating procedure requiring inspection of shielding before operating.

i) Underwater irradiators shall have a personnel access barrier around the pool that shall be locked to prevent access when the irradiator is not attended. Only operators and facility management shall have access to keys to the personnel access barrier. There shall be an intrusion alarm to detect unauthorized entry when the personnel access barrier is locked. Activation of the intrusion alarm shall alert a person (not necessarily onsite) who is prepared to respond or summon assistance.

(Source: Amended at 47 Ill. Reg. 9201, effective June 22, 2023)

Section 346.250 Shielding

a) The radiation dose rate in areas that are normally occupied during operations of a panoramic irradiator may not exceed 0.02 millisievert (2 millirems) per hour at any location 30 centimeters or more from the wall of the room when the sources are exposed. The dose rate shall be averaged over an area not to exceed 100 square centimeters having no linear dimensions greater than 20 cm. Areas where the radiation dose rate exceeds 0.02 millisievert (2 millirems) per hour shall be locked, roped off or posted.

b) The radiation dose at 30 centimeters over the edge of the pool of a pool irradiator may not exceed 0.02 millisievert (2 millirems) per hour when the sources are in fully shielded position.

c) The radiation dose rate at 1 meter from the shield of a dry-source-storage panoramic irradiator when the source is shielded may not exceed 0.02 millisievert (2 millirems) per hour and at 5 centimeters from the shield may not exceed 0.2 millisievert (20 millirems) per hour.

(Source: Amended at 47 Ill. Reg. 9201, effective June 22, 2023)

Section 346.330 Irradiator Pools

a) For licenses initially issued after December 1, 2005, irradiator pools shall either:

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1) Have a water-tight stainless steel liner or a liner metallurgically compatible with other components in the pool; or

2) Be constructed so that there is a low likelihood of substantial leakage and have a surface designed to facilitate decontamination.

In either case, the licensee shall have a method to safely store the sources during repair of the pool.

b) For licenses initially issued after December 1, 2005, irradiator pools shall have no outlets more than 0.5 meter below the normal low water level that could allow water to drain out of the pool. Pipes that have intakes more than~~then~~ 0.5 meter below the normal low water level and that could act as siphons shall have siphon breakers to prevent the siphoning of pool water.

c) A means shall be provided to replenish water losses from the pool.

d) A visible indicator shall be provided in a clearly visible location to indicate if the pool water level is below the normal low water level or above the normal high water level.

e) Irradiator pools shall be equipped with a purification system designed to be capable of maintaining the water during normal operation at a conductivity of 20 microsiemens per centimeter or less and with a clarity so that the sources can be seen clearly.

f) A physical barrier, such as a railing or cover, shall be used around or over radiator pools during normal operation to prevent personnel from accidentally falling into the pool. The barrier may be removed during maintenance, inspection and service operations.

g) If long handled tools or poles are used in irradiator pools, the radiation dose rate in the handling areas of the tools may not exceed 0.02 millisievert (2 millirems) per hour.

(Source: Amended at 47 Ill. Reg. 9201, effective June 22, 2023)

Section 346.350 Source Rack Protection

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If the product to be irradiated moves on a product conveyor system, the source rack and the mechanism that moves the rack shall be protected by a barrier or guides to prevent products and product carriers from hitting or touching the rack or mechanism.

(Source: Amended at 47 Ill. Reg. 9201, effective June 22, 2023)

Section 346.390 Design Requirements

Irradiators whose construction begins after December 1, 2005, shall meet the design requirements of this Section.

a) Shielding. For panoramic irradiators, the licensee shall design shielding walls to meet generally accepted building code requirements for reinforced concrete and design the walls, wall penetrations, and entranceways to meet the radiation shielding requirements of Section 346.250 ~~of this Part~~. If the irradiator will use more than 2×10^{17} becquerels (5 million curies) of activity, the licensee shall evaluate the effects of heating of the shielding by the irradiator sources.

b) Foundations. For panoramic irradiators, the licensee shall design the foundation, with consideration given to soil characteristics, to ensure it is adequate to support the weight of the facility shield walls.

c) Pool integrity. For pool irradiators, the licensee shall design the pool to assure that it is leak resistant, that it is strong enough to bear the weight of the pool water and shipping casks, that a dropped cask would not fall on sealed sources, that all outlets or pipes meet the requirements of Section 346.330(b) ~~of this Part~~ and that metal components are metallurgically compatible with other components in the pool.

d) Water handling system. For pool irradiators, the licensee shall verify that the design of the water purification system is adequate to meet the requirements of Section 346.330(e) ~~of this Part~~. The system shall be designed so that water leaking from the system does not drain to unrestricted areas without being monitored.

e) Radiation monitors. For all irradiators, the licensee shall evaluate the location and sensitivity of the monitor to detect sources carried by the product conveyor system as required by Section 346.290(a) ~~of this Part~~. The licensee shall verify that the product conveyor is designed to stop before a source on the product

conveyor would cause a radiation overexposure to any person. For pool irradiators, if the licensee uses radiation monitors to detect contamination under Section 346.590(b) ~~of this Part~~, the licensee shall verify that the design of radiation monitoring systems to detect pool contamination included sensitive detectors located close to where contamination is likely to concentrate.

f) Source rack. For pool irradiators, the licensee shall verify that there are no crevices on the source or between the source and source holder that would promote corrosion on a critical area of the source. For panoramic irradiators, the licensee shall determine that source rack drops due to loss of power will not damage the source rack and that source rack drops due to failure of cables (or alternative means of support) will not cause loss of integrity of sealed sources. For panoramic irradiators, the licensee shall review the design of the mechanism that moves the sources to assure that the likelihood of a stuck source is low and that, if the rack sticks, a means exists to free it with minimal risk to personnel.

g) Access control. For panoramic irradiators, the licensee shall verify from the design and logic diagram that the access control system will meet the requirements of Section 346.230 ~~of this Part~~.

h) Fire protection. For panoramic irradiators, the licensee shall verify that the number, location and spacing of the smoke and heat detectors are appropriate to detect fires and that the detectors are protected from mechanical and radiation damage. The licensee shall verify that the design of the fire extinguishing system provides the necessary discharge patterns, densities, and flow characteristics for complete coverage of the radiation room and that the system is protected from mechanical and radiation damage.

i) Source return. For panoramic irradiators, the licensee shall verify that the source rack will automatically return to the fully shielded position if offsite power is lost for more than 10 seconds.

j) Seismic. For panoramic irradiators to be built in seismic areas, the licensee shall design the reinforced concrete radiation shields to retain their integrity in the event of an earthquake by designing to the seismic requirements of an appropriate source, such as Chapter 21, "Special Provisions for Seismic Design", of the~~either the~~ American Concrete Institute Standard "Building Code Requirements for Reinforced Concrete" (ACI 318-89)~~, or "Special Provisions for Seismic Design" (Chapter 21)~~ or local building codes, whichever is most current.

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k) Wiring. For panoramic irradiators, the licensee shall verify that electrical wiring and electrical equipment in the radiation room are selected to minimize failures due to prolonged exposure to radiation.

(Source: Amended at 47 Ill. Reg. 9201, effective June 22, 2023)

SUBPART D: OPERATION OF IRRADIATORS

Section 346.510 Training

a) Before personnel are permitted to operate an irradiator without a supervisor present, they shall be instructed in:

1) The fundamentals of radiation protection applied to irradiators (including the differences between external radiation and radioactive contamination; units of radiation dose; IEMA, Division of Nuclear Safety, dose limits; why large radiation doses shall be avoided; how shielding and access controls prevent large doses; how an irradiator is designed to prevent contamination; the proper use of survey meters and personnel dosimeters; other radiation safety features of an irradiator; and the basic function of the irradiator);

2) The requirements of this Part and 32 Ill. Adm. Code 340 and 400 that are relevant to the irradiator;

3) The operation of the irradiator;

4) Those operating and emergency procedures listed in Section 346.530 ~~of this Part~~ that the person is responsible for performing;

5) Case histories of accidents or problems involving irradiators.~~; and~~

~~6) Radiation detection and measurement instrumentation and their proper use and personnel dosimeters.~~

b) Before personnel are permitted to operate an irradiator without a supervisor present, they shall pass a written test on the instruction received consisting primarily of questions based on the licensee's operating and emergency

procedures that the person is responsible for performing and other operations necessary to safely operate the irradiator without supervision.

c) Before personnel are permitted to operate an irradiator without a supervisor present, they shall have received on-the-job training or simulator training in the use of the irradiator as described in the license application, and shall also demonstrate the ability to perform those portions of the operating and emergency procedures that they are to perform.

d) The licensee shall conduct safety reviews for irradiator operators at least annually. The licensee shall give each operator a brief written test on the information. Each safety review shall include, to the extent appropriate, each of the following:

1) Changes in operating and emergency procedures since the last review, if any;

2) Changes in regulations and license conditions since the last review, if any;

3) Reports on recent accidents, mistakes or problems that have occurred at irradiators, if any;

4) Relevant results of inspections of operator safety performance;

5) Relevant results of the facility's inspection and maintenance checks; and

6) A drill to practice an emergency or abnormal event procedure.

e) The licensee shall evaluate the safety performance of each irradiator operator at least annually to ensure that regulations, license conditions and operating and emergency procedures are followed. The licensee shall discuss the results of the evaluation with the operator and shall instruct the operator on how to correct any mistakes or deficiencies observed.

f) Personnel who will be permitted unescorted access to the radiation room of the irradiator or the area around the pool of an underwater irradiator, but who have not received the training required for the operators and the radiation safety officer, shall be instructed and tested in any precautions they should take to avoid radiation exposure, any procedures or parts of procedures listed in Section

346.530 ~~of this Part~~ that they are expected to perform or comply with, and their proper response to alarms required in this Part. Tests may be oral.

g) Personnel who shall be prepared to respond to alarms required by Sections 346.230(b), 346.230(i), 346.270(a), 346.290(a), 346.290(b), and 346.590(b) ~~of this Part~~ shall be trained and tested on how to respond. Each person shall be retested at least once a year. Tests may be oral.

(Source: Amended at 47 Ill. Reg. 9201, effective June 22, 2023)

Section 346.550 Personnel Monitoring

a) Irradiator operators shall wear a personnel dosimeter while operating a panoramic irradiator or while in the area around the pool of an underwater irradiator. The personnel dosimeter must be capable of detecting high energy photons in the normal and accident dose ranges. Personnel monitoring shall be provided in accordance with the requirements of 32 Ill. Adm. Code 340.510(d), (e) and (f).

b) Each ~~personnel~~ dosimeter shall be assigned to and worn by only one person. Film badges shall be processed at least monthly and all other personnel dosimeters that require replacement shall be replaced at least quarterly. All personnel dosimeters shall be evaluated at least quarterly or promptly after replacement, whichever is more frequent.~~, and other personnel dosimeters shall be processed at least quarterly.~~

c) Other personnel who enter the radiation room of a panoramic irradiator shall wear a dosimeter, which may be a pocket dosimeter. For groups of visitors, only 2 people who enter the radiation room are required to wear dosimeters. If pocket dosimeters are used to meet the requirements of this subsection, a check of their response to radiation shall be done at intervals not to exceed 12 months~~least annually~~. Acceptable dosimeters shall read within ±30 percent of the true radiation dose.

(Source: Amended at 47 Ill. Reg. 9201, effective June 22, 2023)

Section 346.570 Radiation Surveys

a) A radiation survey of the area outside the shielding of the radiation room of a panoramic irradiator shall be conducted with the sources in the exposed position

before the facility starts to operate. A radiation survey of the area about the pool of pool irradiators shall be conducted after the sources are loaded but before the facility starts to operate. Additional radiation surveys of the shielding shall be performed at intervals not to exceed 3 years and before resuming operation after addition of new sources or any modification to the radiation room shielding or structure that might increase dose rates.

b) If the radiation levels specified in Section 346.250 ~~of this Part~~ are exceeded, the facility shall be modified to comply with the requirements in Section 346.250 ~~of this Part~~.

c) Portable radiation survey meters used for required surveys shall be calibrated at intervals not to exceed 12 months ~~least annually~~ to an accuracy of ±20% for the gamma energy of the sources in use. The calibration shall be done at two ~~2~~ points on each scale or, for digital instruments, at one point per decade over the range that will be used. Portable radiation survey meters shall be a type that does not saturate and read zero at high radiation dose rate.

d) Water from the irradiator pool, other potentially contaminated liquids and sediments from pool vacuuming shall be monitored for radioactive contamination before release to unrestricted areas. Radioactive concentrations shall not exceed those specified in table 2, column 2, or table 3 of Appendix B to 10 CFR 20, "Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage.", published at 72 Fed. Reg. 55922, October 1, 2007. ~~32 Ill. Adm. Code 340.1030.~~

e) Before releasing resins for unrestricted use, the resins shall be monitored in an area with a background level less than 0.5 microsievert (0.05 millirem) per hour. The resins may be released only if the survey does not detect radiation levels above background radiation levels. The survey meter used shall be capable of detecting radiation levels of 0.5 microsievert (0.05 millirem) per hour.

f) For pool irradiators, all empty or loaded source transport containers shall be surveyed for removable contamination prior to insertion into the pool.

(Source: Amended at 47 Ill. Reg. 9201, effective June 22, 2023)

Section 346.590 Detection of Leaking Sources

a) Each dry-source-storage sealed source shall be tested for leakage in accordance with the requirements of 32 Ill. Adm. Code 340.410.

b) For pool irradiators, sources may not be put into the pool unless the licensee tests the sources for leaks or has a certificate from a transferor that a leak test has been done within the 6 months before the transfer. Water from the pool shall be checked for contamination each day the irradiator operates. The check may be done either by using a radiation monitor on a pool water circulating system or by analysis of a sample of pool water. If a check for contamination is done by analysis of a sample of pool water, the results of the analysis shall be available within 24 hours. If the licensee uses a radiation monitor on a pool water circulating system, the detection of above normal radiation levels shall activate an alarm. The alarm set-point shall be set as low as practical, but high enough to avoid false alarms. The licensee may reset the alarm set-point to a higher level if necessary to operate the pool water purification system to clean up contamination in the pool if specifically provided for in written emergency procedures.

c) If a leaking source is detected, the licensee shall arrange to remove the leaking source from service and have it decontaminated, repaired or disposed of by an Agency, U.S. Nuclear Regulatory Commission, ~~NRC~~ or Agreement State licensee that is authorized to perform these functions. The licensee shall promptly check its personnel, equipment, facilities and irradiated product for radioactive contamination. No product may be shipped until the product has been checked and found free of contamination. If a product has been shipped that may have been inadvertently contaminated, the licensee shall arrange to locate and survey that product for contamination. If any personnel are found to be contaminated, decontamination shall be performed promptly. If contaminated equipment, facilities or products are found, the licensee shall have them decontaminated or disposed of by an Agency, U.S. Nuclear Regulatory Commission, ~~NRC~~ or Agreement State licensee that is authorized to perform these functions. If a pool is contaminated, the licensee shall arrange to clean the pool until the contamination levels do not exceed the appropriate concentration in table 2, column 2, of Appendix B to 10 CFR 20, published at 72 Fed. Reg. 55922, October 1, 2007. (See 32 Ill. Adm. Code 340.1220 for reporting requirements.)

(Source: Amended at 47 Ill. Reg. 9201, effective June 22, 2023)

Section 346.670 Entering and Leaving the Radiation Room

a) Upon first entering the radiation room of a panoramic irradiator after an irradiation, the irradiator operator shall use a survey meter to determine that the source has returned to its fully shielded position. The operator shall check the functioning of the survey meter with a radiation check source prior to entry.

b) Before exiting from and locking the door to the radiation room of a panoramic irradiator prior to a planned irradiation, the irradiator operator shall:

1) Visually inspect the entire radiation room to verify that no one else is in it; and

2) Activate a control in the radiation room that permits the sources to be moved from the shielded position only if the door to the radiation room is locked within a pre-set time after setting the control.

c) During a power failure, the area around the pool of an underwater irradiator may not be entered without using an operable and calibrated radiation survey meter, unless the over-the-pool monitor required by Section 346.290(b) ~~of this Part~~ is operating with backup power.

(Source: Amended at 47 Ill. Reg. 9201, effective June 22, 2023)

SUBPART E: RECORDS

Section 346.810 Records and Retention Periods

The licensee shall maintain the following records at the irradiator for the periods specified.

a) A copy of the license, license conditions, documents incorporated into a license by reference and amendments to these materials, until superseded by new documents or until the Agency terminates the license for documents not superseded.

b) Records of each individual's training, tests and safety reviews provided to meet the requirements of Section 346.510(a), (b), (c), (d), (f), and (g) ~~of this Part~~, until 5 years after the individual terminates work.

c) Records of the annual evaluations of the safety performance of irradiator operators required by Section 346.510(e) ~~of this Part~~, for 5 years after the evaluation.

d) A copy of the current operating and emergency procedures required by Section 346.530 ~~of this Part~~, until superseded or the Agency terminates the license. ~~Records of the radiation safety officer's review and approval of changes in procedure as required by Section 346.530(c)(3) of this Part, retained for 5 years from the date of the change.~~

e) Evaluations of personnel dosimeters required by Section 346.550 ~~of this Part~~, until the Agency terminates the license.

f) Records of radiation surveys required by Section 346.570 ~~of this Part~~, for 5 years from the date of the survey.

g) Records of radiation survey meter calibrations required by Section 346.570 ~~of this Part~~ and pool water conductivity meter calibrations required by Section 346.630(b) ~~of this Part~~, until 5 years from the date of each test.

h) Records of the results of leak tests required by Section 346.590(a) ~~of this Part~~ and the results of contamination checks required by Section 346.590(b) ~~of this Part~~, for 5 years from the date of each test.

i) Records of inspection and maintenance checks required by Section 346.610 ~~of this Part~~, for 5 years.

j) Records of major malfunctions, significant defects, operating difficulties or irregularities and major operating problems that involve required radiation safety equipment, for 5 years after repairs are completed.

k) Records of the receipt, transfer and disposal of all licensed sealed sources as required by 32 Ill. Adm. Code 310.40. The licensee shall retain each record of receipt of byproduct material as long as the material is possessed and for 5 years following transfer or disposal of the material. The licensee who disposed of the material shall retain each record of disposal of byproduct material until the Agency terminates each license that authorizes disposal of the material.

l) Records on the design checks required by Section 346.390 ~~of this Part~~ and the construction control checks as required by Section 346.410 ~~of this Part~~, until the license is terminated. The records shall be signed and dated. The title or qualifications of the personnel signing the record shall be included.

m) Records related to decommissioning of the irradiator as required by 32 Ill. Adm. Code 330.310 and 330.320.

(Source: Amended at 47 Ill. Reg. 9201, effective June 22, 2023)

Section 346.830 Reports

a) In addition to the reporting requirements in other Parts of Agency regulations, the licensee shall report the following events if not reported under other Parts of Agency regulations~~already reported~~:

1) Source stuck in an unshielded position.

2) Any fire or explosion in a radiation room.

3) Damage to the source racks.

4) Failure of cable or drive mechanism used to move the source racks.

5) Inoperability of the access control system.

6) Detection of radiation source by the product exit monitor.

7) Detection of radioactive contamination attributable to licensed radioactive material.

8) Structural damage to the pool liner or walls.

9) Abnormal water loss or leakage from the source storage pool.

10) Pool water conductivity exceeding 100 microsiemens per centimeter.

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b) The report shall include a telephone report within 24 hours as described in 32 Ill. Adm. Code 340.1220 and a written report within 30 days as described in 32 Ill. Adm. Code 340.1230.

(Source: Amended at 47 Ill. Reg. 9201, effective June 22, 2023)

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1) Heading of the Part: Radiation Safety Requirements for Industrial Radiographic Operations

2) Code Citation: 32 Ill. Adm. Code 350

3)

Section Numbers:	Adopted Actions:
350.20	Amendment
350.30	Amendment
350.2030	Amendment
350.APPENDIX C	Amendment

4) Statutory Authority: Implementing and authorized by Section 10 of the Radiation Protection Act of 1990 [420 ILCS 40/10].

5) Effective Date of Rule: June 22, 2023

6) Does this rulemaking contain an automatic repeal date? No

7) Does this rulemaking contain incorporations by reference? No

8) A copy of the Adopted Rule, including any material incorporated by reference, is on file at the Agency's headquarters located at 1035 Outer Park Drive, Springfield, Illinois, and is available for public inspection.

9) Notice of Proposal Published in the *Illinois Register*: 47 Ill. Reg. 4154; March 31, 2023

10) Has JCAR issued a Statement of Objections to this rulemaking? No

11) Differences between Proposal and Final Version: None

12) Have all the changes agreed upon by the Agency and JCAR been made as indicated in the agreement letter issued by JCAR? Yes

13) Will this rulemaking replace an emergency rule currently in effect? No

14) Are there any rulemakings pending on this Part? No

15) Summary and Purpose of Rulemaking: The Agency is amending Part 350 for compatibility with the U.S. Nuclear Regulatory Commission in accordance with RATS

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ID 2020. Amendments include fixing technical errors, updating references, and addressing conflicts with other agency rules.

16) Information and questions regarding these adopted rules shall be directed to:

Traci Burton
Paralegal Assistant
Illinois Emergency Management Agency
1035 Outer Park Drive
Springfield, Illinois 62704

(217) 720-8242
(217) 524-3698

The full text of the Adopted Amendments begin on the next page:

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NOTICE OF ADOPTED AMENDMENTS

TITLE 32: ENERGY
CHAPTER II: ILLINOIS EMERGENCY MANAGEMENT AGENCY
SUBCHAPTER b: RADIATION PROTECTION

PART 350
RADIATION SAFETY REQUIREMENTS FOR
INDUSTRIAL RADIOGRAPHIC OPERATIONS

SUBPART A: GENERAL PROVISIONS

SUBPART B: EQUIPMENT CONTROL

SUBPART C: PERSONAL RADIATION SAFETY REQUIREMENTS FOR
RADIOGRAPHERS AND RADIOGRAPHER TRAINEES

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AUTHORITY: Implementing and authorized by Sections 10, 12 and 16 of the Radiation Protection Act of 1990 [420 ILCS 40/10, 12 and 16].

SOURCE: Filed and effective April 20, 1974, by the Department of Public Health; transferred to the Department of Nuclear Safety by P.A. 81-1516, effective December 3, 1980; codified at 7 Ill.

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Reg. 14744; recodified at 10 Ill. Reg. 11265; amended at 10 Ill. Reg. 17287, effective September 25, 1986; amended at 13 Ill. Reg. 13592, effective August 11, 1989; amended at 18 Ill. Reg. 7263, effective May 2, 1994; expedited correction at 18 Ill. Reg. 10943, effective May 2, 1994; amended at 19 Ill. Reg. 8250, effective June 12, 1995; amended at 19 Ill. Reg. 16591, effective November 27, 1995; emergency amendment at 22 Ill. Reg. 21101, effective November 17, 1998, for a maximum of 150 days; amended at 23 Ill. Reg. 2900, effective February 25, 1999; recodified from the Department of Nuclear Safety to the Illinois Emergency Management Agency at 27 Ill. Reg. 13641; amended at 28 Ill. Reg. 12598, effective October 1, 2004; amended at 30 Ill. Reg. 9167, effective April 28, 2006; amended at 39 Ill. Reg. 9935, effective July 1, 2015; amended at 47 Ill. Reg. 9221, effective June 22, 2023.

SUBPART A: GENERAL PROVISIONS

Section 350.20 Scope

This Part shall apply to all licensees or registrants who use sources of radiation for industrial radiography. Except when the requirements of this Part are clearly applicable only to sealed radioactive sources, or to radiation machines, the requirements of this Part apply to both sealed radioactive sources and radiation machines used for performing industrial radiography procedures. Section 350.3050 ~~of this Part~~ contains special requirements for enclosed radiography and cabinet x-ray systems. Section 350.3090 ~~of this Part~~ contains special requirements for underwater and lay-barge radiography. Nothing in this Part shall apply to the use of sources of radiation for medical use ~~in the healing arts~~. Each licensee and registrant is responsible for ensuring that persons performing activities under a license or certificate of registration comply with 32 Ill. Adm. Code: Chapter II, Subchapters b and d, license conditions, if any, and orders of the Agency.

(Source: Amended at 47 Ill. Reg. 9221, effective June 22, 2023)

Section 350.30 Definitions

As used in this Part, the following definitions apply:

"Agency" means the Illinois Emergency Management Agency.

"ALARA" means as low as is reasonably achievable as defined in 32 Ill. Adm. Code 310.20.

"Annual refresher safety training" means a review conducted or provided by the

licensee or registrant for its employees on radiation safety aspects of industrial radiography.

"Associated equipment" means equipment used in conjunction with a radiographic exposure device to make radiographic exposures where the equipment drives, guides, or comes into contact with the source (e.g., guide tube, control tube, control device cable, removable source stop, "J" tube and collimator when it is used as an exposure head).

"Cabinet radiography" means industrial radiography conducted in an enclosure or cabinet so shielded that doses to individual members of the public at every location on the exterior meet the limitations specified in 32 Ill. Adm. Code 340.310(a).

"Cabinet x-ray system" means an x-ray system with the x-ray tube installed in an enclosure which, independent of existing architectural structures except the floor on which it may be placed, is intended to contain at least that portion of a material being irradiated, provide radiation attenuation and exclude personnel from its interior during generation of x radiation. Included are all x-ray systems designed primarily for the inspection of carry-on baggage at airline, railroad and bus terminals and in similar facilities. An x-ray tube used within a shielded part of a building or x-ray equipment which may temporarily or occasionally incorporate portable shielding is not considered a cabinet x-ray system.

"Certifying entity" means an independent certifying organization meeting the requirements in Appendix A of 10 CFR 34 or an Agreement State meeting the requirements in Appendix A, Parts II and III of 10 CFR 34.

"Collimator" means a radiation shield of lead or other heavy metal which is placed on the end of a guide tube or directly onto a radiographic exposure device to restrict the size and shape of the radiation beam when the sealed source is moved into position to make a radiographic exposure.

"Control cable" or "Drive cable" means the cable that is connected to the source assembly and used to drive the source to and from the exposure location.

"Control drive mechanism" means a device that enables the source assembly to be moved to and from the exposure device.

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"Control tube" means a protective sheath for guiding the control cable. The control tube connects the control drive mechanism to the radiographic exposure device.

"Drive cable" (see "Control cable").

"Enclosed radiography" means industrial radiography conducted in an enclosed cabinet or room and includes cabinet radiography and shielded-room radiography.

"Exposure head" or "Source stop" means a device that locates the gamma radiography sealed source in the selected working position.

"Field examination" or "Practical examination" means a demonstration through practical application of the safety rules and principles of industrial radiography, including 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.

"GED" means general equivalency diploma.

"Guide tube" or "Projection sheath" 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. The guide tube may also include the connections necessary for attachment to the exposure device and to the exposure head.

"Hands-on experience" means experience in all of those areas considered to be directly involved in the radiography process, and includes taking radiographs, calibration of survey instruments, operational and performance testing of survey instruments and devices, film development, posting of radiation areas, transportation of radiography equipment, posting of records and radiation area surveillance, etc., as applicable. Excessive time spent in only one or two of these areas, such as film development or radiation area surveillance, should not be counted toward the 2 years of experience required for a radiation safety officer in Section 350.4020(b)(3) ~~of this Part~~ or the experience for a radiographer as required by 32 Ill. Adm. Code 405.80.

"Independent certifying organization" means an independent organization that meets all the criteria of Appendix A of 10 CFR 34.

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"Industrial radiography" or "radiography" means an examination of the structure of materials by non-destructive methods, utilizing ionizing radiation to make radiographic images.

"Lay-barge radiography" means industrial radiography performed on any water vessel used for laying pipe.

"Lixiscope" means a portable light-intensified imaging device using a sealed source. Lixiscopes are exempted from the requirements of this Part.

"Lock-out survey" means a radiation survey performed to determine that a sealed source is in its shielded position. The lock-out survey is performed before moving the radiographic exposure device or source changer to a new location. The lock-out survey is also performed when securing the radiographic exposure device or source changer against unauthorized removal.

"Permanent radiographic installation" means an enclosed shielded room, cell, or vault, not located at a temporary jobsite, in which radiography is performed.~~installation or structure designed or intended for radiography and in which radiography is regularly performed.~~

"Permanent use or storage location" means a location listed on a radioactive material license or a certificate of registration where sources of radiation are used or stored.

"Personal supervision" means the provision of guidance and instruction to a radiographer trainee by a radiographer who is:

physically present at the site;

in visual contact with the radiographer trainee while the trainee is using sources of radiation; and

in such proximity that immediate assistance can be given if required.

"Pigtail" (see "Source assembly").

"Pill" (see "Sealed source").

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"Projection sheath" (see "Guide tube").

"Radiation safety officer for industrial radiography" means an individual with the responsibility for the overall radiation safety program on behalf of the licensee and who meets the requirements in Section 350.4020~~who is both designated as a radiation safety officer in accordance with Section 350.4020 of this Part and who meets the requirements of Section 350.4020 of this Part and 32 Ill. Adm. Code 310.20~~.

"Radiographer" means any individual who performs or personally supervises industrial radiographic operations. Radiographers shall meet the requirements of Section 350.2010(a) ~~of this Part~~ and shall comply with the requirements of 32 Ill. Adm. Code: Chapter II, Subchapters b and d, all license conditions, if any, and orders of the Agency.

"Radiographer certification" means written approval, received from the Agency in accordance with 32 Ill. Adm. Code 405, stating that an individual has satisfactorily met certain established radiation safety and experience criteria.

"Radiographer trainee" means any individual who uses sources of radiation and related handling tool or radiation survey instruments under the personal supervision of a radiographer. Radiographer trainees shall meet the requirements of Section 350.2010(b) ~~of this Part~~ and shall comply with the requirements of 32 Ill. Adm. Code: Chapter II, Subchapters b and d, all license conditions, if any, and orders of the Agency.

"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 an unshielded position for purposes of making a radiographic exposure (i.e, camera).

"Radiographic operations" means all activities associated with the presence of radioactive sources in a radiographic exposure device during use of the device or transport (except when being transported by a common or contract transport) to include surveys to confirm the adequacy of boundaries, setting up equipment and any activity inside restricted area boundaries.

"Radiography" (see "Industrial radiography").

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"S-tube" means a tube through which the radioactive source travels when inside a radiographic exposure device.

"Sealed source" or "Pill" means any capsule or matrix as defined in 32 Ill. Adm. Code 310.20.

"Shielded position" means the location within the radiographic exposure device or storage container which, by manufacturer's design, is the proper location for storage of the sealed source.

"Shielded-room radiography" means industrial radiography conducted in a room so shielded that doses to individual members of the public at every location on the exterior meet the limitations as specified in 32 Ill. Adm. Code 340.310(a) (i.e., bay, bunker, cell).

"Source assembly" or "Pigtail" means an assembly that 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 source changers also used for transporting and storage of sealed sources.

"Storage container" means the structure in which sealed sources are secured and stored at a permanent storage location as described in Section 350.4010(c)(5) ~~of this Part~~.

"Source stop" (see "Exposure head").

"Temporary jobsite~~job site~~" means any location where licensed material is used or stored for 180 days or less during any consecutive 12 months, and not specifically listed on a radioactive material license.~~that is not specifically listed on a radioactive material license or certificate of registration where industrial radiography is performed for 180 days or less during any consecutive 12 months.~~

"Transport container" means a package that is designed and constructed to provide radiation safety and security when sealed sources are transported and

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meets all applicable regulations of the U.S. Department of Transportation.

"Underwater radiography" means industrial radiography performed when the radiographic exposure device and related equipment are beneath the surface of water.

(Source: Amended at 47 Ill. Reg. 9221, effective June 22, 2023)

SUBPART C: PERSONAL RADIATION SAFETY REQUIREMENTS FOR RADIOGRAPHERS AND RADIOGRAPHER TRAINEES

Section 350.2030 Personnel Monitoring Control

a) The licensee or registrant shall not permit any individual to act as a radiographer or as a radiographer trainee unless, at all times during radiographic operations, each individual wears, on the trunk of the body, a direct reading pocket ionization chamber (i.e., pocket dosimeter) and an individual monitoring device (i.e., personnel dosimeter).~~provided and evaluated by a qualified dosimetry processor as described in 32 Ill. Adm. Code 340.510(d)~~ Each device shall be assigned to and worn by only one individual.~~ After replacement, each individual monitoring device must be processed as soon as possible.~~

b) Pocket ionization chambers (i.e., pocket dosimeters) shall meet the criteria in ANSI N322-1997, "Inspection, Test, Construction, and Performance Requirements for Direct Reading Electrostatic/Electroscope Type Dosimeters", published in 1997~~N13.5-1972, "Performance Specifications for Direct Reading and Indirect Reading Pocket Dosimeters for X- and Gamma Radiation" published 1972, exclusive of subsequent amendments or editions~~.

c) The use of pocket ionization chambers (i.e., pocket dosimeters) is subject to the following requirements:

1) Pocket ionization chambers (i.e., pocket dosimeters) must have a range from zero to 2 millisieverts (200 millirems). Pocket ionization chambers shall be recharged at least daily or at least at the start of each work shift. Electronic personal dosimeters may only be used in place of ion-chamber pocket dosimeters;

2) Pocket ionization chambers shall be read and exposures recorded at least

at the beginning and end of each worker's shift involving the use of a source of radiation;

3) Pocket dosimeters, or electronic personal dosimeters, must be checked at periods not to exceed 12 months for correct response to radiation. ~~Pocket ionization chambers shall be checked for correct response to radiation at periods not to exceed 1 year.~~ Acceptable dosimeters shall read within plus or minus 20~~30~~ percent of the true radiation exposure. Records of pocket ionization chamber (i.e., pocket dosimeter) calibrations shall be maintained for inspection by the Agency for 5 years; and

4) If an individual's pocket ionization chamber is discharged beyond its range (i.e., goes "off-scale"), or if an individual's electronic personal dosimeter reads greater than 2 millisieverts (200 millirems), and the possibility of radiation exposure cannot be ruled out as the cause, the individual's personnel dosimeter that requires processing must be sent for processing and evaluation within 24 hours. For personnel dosimeters that do not require processing, evaluation of the dosimeter must be started within 24 hours. In addition, the individual may not resume work associated with licensed material use until a determination of the individual's radiation dose has been made. ~~industrial radiographic operations by that individual shall cease immediately and the individual's monitoring device shall be sent immediately for processing. The individual shall not use sources of radiation until a determination of the individual's radiation dose has been made.~~ The determination must be made by the RSO or the RSO's designee. The results of this determination must be included in records maintained in accordance with subsection (d) ~~of this Section~~.

~~5) If the individual monitoring device that is required by subsection (a) of this Section is lost or damaged, the worker shall cease work immediately until a replacement monitoring device meeting the requirements in subsection (a) of this Section is provided and the exposure is calculated for the time period from issuance to loss or damage of the individual monitoring device. The results of this calculated exposure and the time period for which the monitoring device was lost or damaged must be included in the records maintained in accordance with subsection (d) of this Section.~~

d) Records of individual monitoring device (i.e., personnel dosimeter) results ~~Reports~~

~~received from the individual monitoring device processor~~; records of daily pocket ionization chamber (i.e., pocket dosimeter) readings, records of estimates of exposures associated with off-scale pocket ionization chambers; and/or lost or damaged individual monitoring devices shall be kept for inspection by the Agency until the radioactive material license or certificate of registration is terminated. ~~or until the Agency authorizes their disposition, in writing, following a determination by the Agency that the records contain inaccurate personnel monitoring information.~~

e) Individual monitoring devices (i.e., personnel dosimeters) that require replacement shall be replaced at periods not to exceed one month. After replacement, each individual monitoring device shall be returned to the supplier for evaluation no later than 14 calendar days of the exchange date specified by the personnel monitoring supplier or as soon as practicable. In circumstances that make it impossible to return each individual monitoring device within the required time period, such circumstances shall be documented and available for review by the Agency.

f) If the individual monitoring device (i.e., personnel dosimeter) that is required by subsection (a) is lost or damaged, the worker shall cease work immediately until a replacement monitoring device meeting the requirements in subsection (a) is provided and the exposure is calculated for the time period from issuance to loss or damage of the individual monitoring device. The results of this calculated exposure and the time period for which the individual monitoring device was lost or damaged must be included in the records maintained in accordance with subsection (d).

g~~e~~) In addition to other requirements of this Section, each individual performing radiography with sealed sources at a location other than a permanent radiography installation shall wear an alarm ratemeter. Each alarm ratemeter shall:

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

2) Be set to give an alarm signal at a preset dose rate of 5mSv (500 mrem) per hour or less;

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

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4) Be calibrated, at periods not to exceed 1 year, for correct response to radiation. Ratemeters shall alarm within plus or minus 20 percent of the true radiation dose rate. Records of alarm ratemeter calibrations shall be maintained for inspection by the Agency for 5 years.

h~~f~~) The alarm ratemeter shall be used in addition to, and not as a substitute for, the portable survey instrument required by Section 350.3030 ~~of this Part~~. The alarm ratemeter is intended to provide additional assurance that the radiation exposure levels are within regulatory limits.

(Source: Amended at 47 Ill. Reg. 9221, effective June 22, 2023)

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Section 350.APPENDIX C Retention Requirements for Records

Specific Section	Name of Record	Record Retention Period
350.50	Receipt, Transfer and Disposal	Until the radioactive material license or certificate of registration is terminated
350.1040(c)	Survey Instrument Calibration	5 years
350.1050(c)	Leakage or Contamination Tests	5 years
350.1060	Quarterly Inventory	5 years
350.1070	Utilization Logs	5 years
350.1080	Quarterly Inspection and Maintenance	5 years
350.1090	High Radiation Area Control Devices or Alarm Systems	5 years
350.2010(c)	Training and Testing Records	Until the radioactive material license or certificate of registration is terminated. 3 years after termination of employment
350.2010(d)	Internal Audit Program	5 years
350.2030(c)	Pocket Ionization Chamber (i.e., Pocket Dosimeter) Calibrations	5 years
350.2030(d)	Personnel Monitoring Records Pocket Ionization Chamber (i.e., Pocket Dosimeter) Readings	Until the radioactive material license or certificate of registration is terminated
350.2030(ge)(4)	Alarm Ratemeter Calibrations	5 years

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350.3030	Radiation Surveys	5 years or until the radioactive material license or certificate of registration is terminated if a survey was used to determine an individual's exposure
350.3040	Records at Temporary Job Sites	During temporary job site operations
350.3050	Initial and Annual Evaluations of Enclosed Radiography Systems	5 years
350.4010	License, documents incorporated by reference and amendments to each of these items	Until the radioactive material license is terminated by the Agency or until 3 years after being superseded by new documents approved by the Agency

(Source: Amended at 47 Ill. Reg. 9221, effective June 22, 2023)

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NOTICE OF ADOPTED REPEALER

1) Heading of the Part: Radiation Safety Requirements for Wireline Service Operations and Subsurface Tracer Studies

2) Code Citation: 32 Ill. Adm. Code 351

3)

Section Numbers:	Adopted Actions:
351.10	Repealed
351.20	Repealed
351.25	Repealed
351.30	Repealed
351.40	Repealed
351.1010	Repealed
351.1020	Repealed
351.1030	Repealed
351.1040	Repealed
351.1050	Repealed
351.1060	Repealed
351.1070	Repealed
351.1080	Repealed
351.1090	Repealed
351.1100	Repealed
351.2010	Repealed
351.2020	Repealed
351.2030	Repealed
351.3010	Repealed
351.3020	Repealed
351.3022	Repealed
351.3025	Repealed
351.3027	Repealed
351.3030	Repealed
351.3040	Repealed
351.4010	Repealed
351.4020	Repealed
351.4030	Repealed
351.5010	Repealed
351.APPENDIX A	Repealed
351.APPENDIX B	Repealed

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NOTICE OF ADOPTED REPEALER

4) Statutory Authority: Implementing and authorized by Sections 9 and 11 of the Radiation Protection Act of 1990 [420 ILCS 40/0 and 11] and Section 5 of the Personnel Radiation Monitoring act [420 ILCS 25/5].

5) Effective Date of Repealer: June 22, 2023

6) Does this Repealer contain an automatic repeal date? No

7) Does this Repealer contain incorporations by reference? No

8) A copy of the Adopted Repealer, including any material incorporated by reference, is on file at the Agency's headquarters located at 1035 Outer Park Drive, Springfield, Illinois, and is available for public inspection.

9) Notice of Proposal Published in the *Illinois Register*: 47 Ill. Reg. 4171; March 31, 2023

10) Has JCAR issued a Statement of Objections to this Repealer? No

11) Differences between proposal and final version: None

12) Have all changes agreed upon by the Agency and JCAR been made as indicated in the agreement letter issued by JCAR? Yes

13) Will this Repealer replace an emergency rule currently in effect? No

14) Are there any rulemakings pending on this Part? No

15) Summary and Purpose of Repealer: IEMA is proposing to repeal the existing rule to replace it with a new version of 32 Ill. Adm. Code 351. Numerous changes were necessary in order to make Part 351 compatible with U.S. Nuclear Regulatory Commission (NRC) regulations for the Agreement State program. In the interest of transparency and to make the rulemaking process more efficient, IEMA is repealing the existing rule and replacing it with a proposed rule filed at the same time.

16) Information and questions regarding this adopted repealer shall be directed to:

Traci Burton
Paralegal Assistant
Illinois Emergency Management Agency

ILLINOIS EMERGENCY MANAGEMENT AGENCY

NOTICE OF ADOPTED REPEALER

1035 Outer Park Drive
Springfield, Illinois 62704

(217) 720-8242

ILLINOIS EMERGENCY MANAGEMENT AGENCY

NOTICE OF ADOPTED RULE

1) Heading of the Part: Radiation Safety Requirements for Wireline Service Operations and Subsurface Tracer Studies

2) Code Citation: 32 Ill. Adm. Code 351

3)

Section Numbers:	Adopted Actions:
351.10	New Section
351.20	New Section
351.25	New Section
351.30	New Section
351.110	New Section
351.130	New Section
351.150	New Section
351.310	New Section
351.330	New Section
351.350	New Section
351.370	New Section
351.390	New Section
351.410	New Section
351.430	New Section
351.450	New Section
351.470	New Section
351.490	New Section
351.510	New Section
351.530	New Section
351.550	New Section
351.610	New Section
351.630	New Section
351.650	New Section
351.670	New Section
351.690	New Section
351.695	New Section
351.710	New Section
351.730	New Section
351.750	New Section
351.770	New Section
351.APPENDIX A	New Section
351.APPENDIX B	New Section

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4) Statutory Authority: Implementing and authorized by Sections 9, 10, 11, 16 and 29 of the Radiation Protection Act of 1990 [420 ILCS 40].

5) Effective Date of Rule: June 22, 2023

6) Does this rulemaking contain an automatic repeal date? No

7) Does this rulemaking contain incorporations by reference? No

8) A copy of the Adopted Rule, including any material incorporated by reference, is on file at the Agency's headquarters located at 1035 Outer Park Drive, Springfield, Illinois, and is available for public inspection.

9) Notice of Proposal Published in the *Illinois Register*: 47 Ill. Reg. 4196; March 31, 2023

10) Has JCAR issued a Statement of Objections to this rulemaking? No

11) Differences between proposal and final version:

In Section 351.25 b), capitalize "materials".

In Section 351.25 b) 2), change "1-800-368-5642" to "(800) 368-5642".

In Section 351.30, capitalize "fresh".

In Section 351.310 heading, add a comma after "Security".

In Section 351.330 c), change "each have" to "have each".

In Section 351.330 d), delete "Calibration records shall be maintained for a period of 3 years for inspection by the Agency.".

In Section 351.410 b), after "sealed source" delete "for use" and after "applications" add "only".

In Section 351.410 c), after "sealed source" delete "for use".

In Section 351.430 a), after "listing" delete the colon.

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In Section 351.430 b), change the colon after "listing" to "the".

In Section 351.710 a), delete the duplicate "and another".

12) Have all the changes agreed upon by the Agency and JCAR been made as indicated in the agreement letter issued by JCAR? Yes

13) Will this rulemaking replace an emergency rule currently in effect? No

14) Are there any rulemakings pending on this Part? No

15) Summary and Purpose of Rulemaking: IEMA is proposing this rule to replace the existing 32 Ill. Adm. Code 351. Numerous changes were necessary in order to make Part 351 compatible with U.S. Nuclear Regulatory Commission (NRC) regulations for the Agreement State program. In the interest of transparency and to make the rulemaking process more efficient, IEMA is repealing the existing rule and replacing it with this proposed rule. This proposed rule incorporates changes required by NRC in accordance with RATS ID 2020-1. In addition, compared to the current Part 351, this proposed rule reorganizes the structure of the rule for easier use by stakeholders and to correlate with NRC rules, updates references, updates and adds definitions, resolves conflicts with other State agency rules, and reduces undue regulatory burden where possible.

16) Information and questions regarding this adopted rule shall be directed to:

Traci Burton
Paralegal Assistant
Illinois Emergency Management Agency
1035 Outer Park Drive
Springfield, Illinois 62704

(217) 720-8242
(217) 524-3698

The full text of the Adopted Rule begins on the next page:

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NOTICE OF ADOPTED RULE

TITLE 32: ENERGY
CHAPTER II: ILLINOIS EMERGENCY MANAGEMENT AGENCY
SUBCHAPTER b: RADIATION PROTECTION

PART 351
RADIATION SAFETY REQUIREMENTS FOR WIRELINE SERVICE OPERATIONS AND SUBSURFACE TRACER STUDIES

SUBPART A: GENERAL PROVISIONS

SUBPART B: SPECIFIC LICENSING REQUIREMENTS

SUBPART C: EQUIPMENT

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SUBPART D: RADIATION SAFETY REQUIREMENTS

SUBPART E: SECURITY, RECORDS, NOTIFICATIONS

AUTHORITY: Implementing and authorized by Sections 9, 10, 11, 16, and 29 of the Radiation Protection Act of 1990 [420 ILCS 40].

SOURCE: Adopted at 10 Ill. Reg. 17507, effective September 25, 1986; amended at 11 Ill. Reg. 5215, effective March 13, 1987; amended at 13 Ill. Reg. 13605, effective August 11, 1989; amended at 14 Ill. Reg. 13633, effective August 13, 1990; amended at 18 Ill. Reg. 3344, effective February 22, 1994; emergency amendment at 22 Ill. Reg. 21108, effective November 17, 1998, for a maximum of 150 days; amended at 23 Ill. Reg. 2907, effective February 25, 1999; recodified from the Department of Nuclear Safety to the Illinois Emergency Management Agency at 27 Ill. Reg. 13641; amended at 28 Ill. Reg. 12643, effective October 1, 2004; Part repealed at 47 Ill. Reg. 9237, effective June 22, 2023; new Part adopted at 47 Ill. Reg. 9240, effective June 22, 2023.

SUBPART A: GENERAL PROVISIONS

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Section 351.10 Purpose

This Part establishes requirements for the issuance of a license authorizing the use of licensed materials including sealed sources, radioactive tracers, radioactive markers, and uranium sinker bars in well logging in a single well. This Part also establishes radiation safety requirements for persons using licensed materials in these operations. The requirements of this Part are in addition to, and not in substitution for, the requirements of 32 Ill. Adm. Code: Chapter II, Subchapters b and d.

Section 351.20 Scope

This Part applies to all licensees or registrants who use sources of radiation for wireline service operations, including mineral logging, radioactive markers, or subsurface tracer studies.

Section 351.25 Incorporations by Reference

a) All rules, standards, and guidelines of agencies of the United States or nationally recognized organizations or associations that are incorporated by reference in this Part are incorporated as of the date specified in the reference and do not include any later amendments or editions. Copies of these rules, standards, and guidelines that have been incorporated by reference are available for public inspection at the Illinois Emergency Management Agency, 1035 Outer Park Drive, Springfield, Illinois.

b) Incorporated Materials

1) "Classification of Sealed Radioactive Sources" (1968), Standard N5.10-1968, United States of America Standards Institute (USASI) (now American National Standards Institute (ANSI)), 1899 L Street, NW, 11th Floor, Washington, DC 20036; (202) 293-8020; https://www.ansi.org.

2) "Consolidated Guidance About Materials Licenses: Program-Specific Guidance About Well Logging, Tracer, and Field Flood Study Licenses: Final Report" (2018), NUREG-1556, Vol. 14, Rev. 1, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; (800) 368-5642; available at https://www.nrc.gov/docs/ML1812/ML18120A129.pdf.

3) "Sealed Radioactive Sources – Classification" (1997), Standard N43.6-1997, American National Standards Institute/Health Physics Society

ILLINOIS EMERGENCY MANAGEMENT AGENCY

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(ANSI/HPS)), 1899 L Street, NW, 11th Floor, Washington, DC 20036; (202) 293-8020; https://www.ansi.org.

Section 351.30 Definitions

As used in this Part, the following definitions apply:

"Agency" means the Illinois Emergency Management Agency.

"Energy compensation source (ECS)" means a small sealed source, with an activity not exceeding 3.7 MBq (100 microcuries), used within a logging tool, or other tool components, to provide a reference standard to maintain the tool's calibration when in use.

"Field station" means a facility where radiation sources may be stored or used and from which equipment is dispatched to temporary jobsites.

"Fresh water aquifer" means a geological formation that is capable of yielding fresh water to a well or spring.

"Injection tool" means a device used for controlled subsurface injection of radioactive tracer material.

"Irretrievable well logging source" means any sealed source containing radioactive material that is pulled off or not connected to the wireline that suspends the source in the well and for which all reasonable effort at recovery has been expended.

"Logging assistant" means any individual who, under the personal supervision of a logging supervisor, handles sealed sources or tracers that are not in logging tools or shipping containers or who performs surveys required by Section 351.670.

"Logging supervisor" means an individual who uses licensed material or provides personal supervision in the use of licensed material at a temporary jobsite and who is responsible to the licensee for assuring compliance with the requirements of the Agency's regulations and the conditions of the license.

"Logging tool" means a device used subsurface to perform well logging.

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"Mineral logging" means any logging performed for the purpose of mineral exploration other than oil or gas.

"Personal supervision" means guidance and instruction by a logging supervisor, who is physically present at a temporary jobsite, who is in personal contact with logging assistants, and who can give immediate assistance.

"Radioactive marker" means licensed material used for depth determination or direction orientation. For purposes of this Part, this term includes radioactive collar markers and radioactive iron nails.

"Safety review" means a periodic review provided by the licensee for its employees on radiation safety aspects of well logging. 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.

"Source holder" means a housing or assembly into which a sealed source is placed to facilitate the handling and use of the source in well logging operations.

"Subsurface tracer study" means the release of unsealed licensed material or a substance labeled with licensed material in a single well for the purpose of tracing the movement or position of the material or substance in the well or adjacent formation.

"Surface casing for protecting fresh water aquifers" means a pipe or tube used as a lining in a well to isolate fresh water aquifers from the well.

"Temporary jobsite" means any location where licensed material is used or stored for 180 days or less during any consecutive 12 months, and not specifically listed on a radioactive material license.

"Tritium neutron generator target source" means a tritium (hydrogen-3) source used within a neutron generator tube to produce neutrons for use in well logging applications.

"Uranium sinker bar" means a weight containing depleted uranium used to pull a logging tool toward the bottom of a well.

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"Well" means a drilled hole in which well logging may be performed. As used in this Part, "well" includes drilled holes for the purpose of disposal or oil, gas, mineral, groundwater, or geological exploration.

"Well-bore" means a drilled hole in which wireline service operations and subsurface tracer studies are performed.

"Well logging" means all operations involving the lowering and raising of measuring devices or tools which contain licensed material or are used to detect licensed materials in wells for the purpose of obtaining information about the well or adjacent formations which may be used in oil, gas, mineral, groundwater, or geological exploration.

"Wireline" means a cable containing one or more electrical conductors which is used to lower and raise logging tools in the well-bore.

"Wireline service operation" means any evaluation or mechanical service which is performed in the well-bore using devices on a wireline.

SUBPART B: SPECIFIC LICENSING REQUIREMENTS

Section 351.110 Application for a Specific License

A person, as defined in 32 Ill. Adm. Code 310.20, may apply for a specific license authorizing the use of licensed material in well logging. Applications shall be filed in accordance with 32 Ill. Adm. Code 330.240.

Section 351.130 Specific License for Well Logging

The Agency will approve an application for a specific radioactive material license in well logging if the applicant meets the following requirements:

a) Complies with the general requirements specified in 32 Ill. Adm. Code 330.250.

b) Develops and submits to the Agency a program for training logging supervisors and logging assistants which specifies the details of:

1) Initial training;

2) On-the-job training;

3) Annual safety reviews to be provided by the licensee;

4) The means the applicant will use to demonstrate the logging supervisor's knowledge and understanding of and ability to comply with the Agency's regulations and licensing requirements and the Applicant's operating and emergency procedures; and

5) The means the applicant will use to demonstrate the logging assistant's knowledge and understanding of and ability to comply with the Agency's rules, license conditions, and the applicant's operating and emergency procedures.

c) Submits written operating and emergency procedures as required in Section 351.630.

d) Establishes and submits to the Agency a program for annual inspections of the job performance of each logging supervisor to ensure that the Agency's regulations, license conditions, and the applicant's operating and emergency procedures are followed. The applicant's annual inspection program shall include provisions to retain inspection records for 3 years after each annual internal inspection.

e) Submits a description of the overall organizational structure as it applies to the radiation safety responsibilities in well logging and specifies delegations of authority and responsibility.

f) If the Applicant intends to perform leak testing of sealed sources, establishes and submits to the Agency procedures for leak testing that include the following information:

1) The instruments to be used;

2) The methods of performing the analysis; and

3) The pertinent experience of the person who will analyze the wipe samples.

Section 351.150 Agreement with Well Owner or Operator

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a) A licensee may perform well logging with a sealed source only after the licensee has a written agreement with the employing well owner or operator. This written agreement shall identify who will meet the following requirements:

1) If a sealed source becomes lodged in the well, a reasonable effort will be made to recover it.

2) A person may not attempt to recover a sealed source in a manner which, in the licensee's opinion, could result in its rupture.

3) Radiation monitoring required in Section 351.690(a).

4) If the environment, any equipment, or personnel are contaminated with licensed material, they must be decontaminated before release from the site or release for unrestricted use.

5) If the sealed source is classified as irretrievable after reasonable efforts at recovery have been expended, the following requirements shall be implemented within 30 days:

A) Each irretrievable well logging source shall be immobilized and sealed in place with a cement plug;

B) A means to prevent inadvertent intrusion on the source shall be established unless the source is not accessible to any subsequent drilling operations; and

C) A permanent identification plaque, constructed of long-lasting material such as stainless steel, brass, bronze, or monel, shall be mounted at the surface of the well unless the mounting of the plaque is not practical. The size of the plaque must be at least 17 cm (7 inches) square and 3 mm (⅛ inch) thick. The plaque shall contain:

i) The word "CAUTION";

ii) The radiation symbol (the color requirement in 32 Ill. Adm. Code 340.910(a) need not be met);

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iii) The date the source was abandoned;

iv) The name of the well owner or well operator, as appropriate;

v) The well name and well identification number or other designation;

vi) An identification of the sealed source by radionuclide and quantity;

vii) The depth of the source and depth to the top of the plug; and

viii) An appropriate warning, such as, "DO NOT RE-ENTER THIS WELL."

b) The licensee shall retain a copy of the written agreement for 3 years after the completion of the well logging operation.

c) A licensee may request Agency approval, on a case-by-case basis, of proposed procedures to abandon an irretrievable well logging source in a manner not otherwise authorized in subsection (a)(5).

d) A written agreement between the licensee and the well owner or operator is not required if the licensee and the well owner or operator are part of the same corporate structure or otherwise similarly affiliated. However, the licensee shall still meet the requirements in subsections (a)(1) through (a)(5).

SUBPART C: EQUIPMENT

Section 351.310 Labels, Security, and Transportation Precautions

a) Labels

1) The licensee may not use a source, source holder, or logging tool that contains licensed material unless the smallest component that is transported as a separate piece of equipment with the licensed material inside bears a durable, legible, and clearly visible marking or label. The

marking or label must contain the radiation symbol specified in 32 Ill. Adm. Code 340.910(a), without the conventional color requirements, and the wording "DANGER (or CAUTION) RADIOACTIVE MATERIAL."

2) The licensee may not use a container to store licensed material unless the container has a securely attached label that is durable, legible, and clearly visible. The label must contain the radiation symbol specified in 32 Ill. Adm. Code 340.910(a) and the wording "CAUTION (or DANGER), RADIOACTIVE MATERIAL, NOTIFY CIVIL AUTHORITIES (or NAME OF COMPANY)."

3) The licensee may not transport licensed material unless the material is packaged, labeled, marked, and accompanied with appropriate shipping papers pursuant to 32 Ill. Adm. Code 341.

b) Security Precautions During Storage and Transportation

1) The licensee shall store each source containing licensed material in a storage container or transportation package. The container or package shall be locked and physically secured to prevent tampering or removal of licensed material from storage 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.

Section 351.330 Radiation Detection Instruments

a) The licensee or registrant shall keep sufficient calibrated and operable radiation survey instruments at each field station and temporary jobsite to make physical radiation surveys as required by this Part and by 32 Ill. Adm. Code 340.510(a). Instrumentation shall be capable of measuring 0.001 mSv (0.1 mrem) per hour through at least 0.5 mSv (50 mrem) per hour.

b) The licensee shall have available additional calibrated and operable radiation detection instruments sensitive enough to detect the low radiation and

contamination levels that could be encountered if a sealed source ruptured. The licensee may own the instruments or may have a procedure to obtain them quickly from a second party.

c) The licensee must have each radiation survey instrument required under subsections (a) and (b) calibrated:

1) At intervals not to exceed 6 months and after each instrument servicing (e.g., electronic repair);

2) For linear scale instruments, at two points located approximately ⅓ and ⅔ 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 accuracy within plus or minus 20 percent of the calibration standard can be demonstrated on each scale.

d) The licensee shall retain calibration records for a period of 3 years after the date of calibration for inspection by the Agency.

Section 351.350 Leak Testing of Sealed Sources

a) Testing and Recordkeeping Requirements. Each licensee who uses a sealed source shall have the source tested for leakage as described in subsection (c). The licensee shall keep a record of leak test results under 32 Ill. Adm. Code 340.1135.

b) Method of Testing. The wipe of a sealed source shall be performed using a leak test kit or method approved by the Agency, the U.S. Nuclear Regulatory Commission, or an Agreement State. The wipe sample shall be taken from the nearest accessible point to the sealed source where contamination might accumulate. The wipe sample shall be analyzed for radioactive contamination. The analysis shall be capable of detecting the presence of 185 Bq (0.005 microcuries) of radioactive material on the test sample and shall be performed by a person approved by the Agency, the U.S. Nuclear Regulatory Commission, or an Agreement State to perform the analysis.

c) Test Frequency

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1) Each sealed source, except an energy compensation source (ECS), shall be tested 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 before the transfer, the sealed source may not be used until tested.

2) Each ECS that is not exempt from testing pursuant to subsection (e) shall be tested at intervals not to exceed 3 years. In the absence of a certificate from a transferor that a test has been made within the 3 years before the transfer, the ECS may not be used until tested.

d) Removal of Leaking Source from Service

1) If the test conducted pursuant to subsections (a) and (b) reveals the presence of 185 Bq (0.005 microcuries) or more of removable radioactive material, the licensee shall remove the sealed source from service immediately and have it decontaminated, repaired, or disposed of by an Agency, U.S. Nuclear Regulatory Commission, or Agreement State licensee that is authorized to perform these functions. The licensee shall check the equipment associated with the leaking source for radioactive contamination and, if contaminated, have it decontaminated or disposed of by an Agency, U.S. Nuclear Regulatory Commission, or Agreement State licensee that is authorized to perform these functions.

2) Reports of test results for leaking or contaminated sealed sources shall be made pursuant to 32 Ill. Adm. Code 340.1260.

e) Exemptions from Testing Requirements. The following sealed sources are exempt from the periodic leak test requirements set out in subsections (a) through (d):

1) Hydrogen-3 (tritium) sources;

2) Sources containing licensed material with a half-life of 30 days or less;

3) Sealed sources containing licensed material in gaseous form;

4) Sources of beta- or gamma-emitting radioactive material with an activity of 3.7 MBq (100 microcuries) or less; and

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5) Sources of alpha- or neutron-emitting radioactive material with an activity of 0.37 MBq (10 microcuries) or less.

Section 351.370 Quarterly Physical Inventory

Each licensee or registrant shall conduct a quarterly physical inventory to account for all sources of radiation. If all sources are not accounted for during the inventory, the licensee or registrant shall notify the Agency in accordance with the requirements of 32 Ill. Adm. Code 340.1210. Records of inventories shall be maintained for 3 years from the date of inventory for inspection by the Agency and shall include the quantities and kinds of sources of radiation, the location of the sources of radiation, the date of the inventory, and the name of the individual conducting the inventory. Physical inventory records may be combined with leak test records, as appropriate.

Section 351.390 Records of Use for Radioactive Material

a) Each licensee or registrant shall maintain records for each use of licensed material, including:

1) The make, model number, and a serial number or a description of each sealed source of radiation used;

2) In the case of unsealed licensed material used for subsurface tracer studies, the radionuclide and quantity of activity used in a particular well and the disposition of any unused tracer materials;

3) The identity of the logging supervisor who is responsible for the licensed material and the identity of logging assistants present; and

4) The location and date of use of the licensed material.

b) The licensee or registrant shall retain the use records for 3 years from the date of the recorded event and make them available for inspection by the Agency.

Section 351.410 Design and Performance Criteria for Sources

a) A licensee may not use a sealed source in well logging unless:

1) The sealed source is doubly encapsulated;

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2) The sealed source contains licensed material whose chemical and physical forms are as insoluble and non-dispersible as practical; and

3) The sealed source meets the requirements of subsection (b), (c), or (d).

b) For a sealed source manufactured on or before July 14, 1989, a licensee may use the sealed source in well logging applications only if it meets the requirements of the United States of America Standards Institute (USASI) N5.10-1968, "Classification of Sealed Radioactive Sources", incorporated by reference in Section 351.25, or the requirements in subsection (c) or (d).

c) For a sealed source manufactured after July 14, 1989, a licensee may use the sealed source in well logging applications if it meets the oil well logging requirements of the American National Standards Institute/Health Physics Society (ANSI/HPS) N43.6-1997, "Sealed Radioactive Sources − Classification."

d) For a sealed source manufactured after July 14, 1989, a licensee may use the sealed source, for well logging applications only if a prototype of the sealed source has been tested and found to maintain its integrity after each of the following tests:

1) Temperature. The test source was held at -40 °C for 20 minutes, 600 °C for 1 hour, and then subjected to a thermal shock test with a temperature drop from 600 °C to 20 °C within 15 seconds.

2) Impact Test. A 5 kg steel hammer, 2.5 cm in diameter, was dropped from a height of 1 m onto the test source.

3) Vibration Test. The test source was subjected to a vibration from 25 Hz to 500 Hz at an amplitude of 5 times the acceleration of gravity for 30 minutes.

4) Puncture Test. A 1-gram hammer and pin, 0.3 cm pin diameter, was dropped from a height of 1 m onto the test source.

5) Pressure Test. The test source was subjected to an external pressure of 16.95 MPascals (24,600 pounds per square inch absolute).

e) The requirements of subsections (a), (b), (c), and (d) do not apply to sealed

sources that contain licensed material in gaseous form.

f) The requirements of subsections (a), (b), (c), and (d) do not apply to energy compensation sources (ECSs). ECSs shall be registered with the Agency, the U.S. Nuclear Regulatory Commission, or another Agreement State pursuant to the equivalent of 32 Ill. Adm. Code 330.280(m)(2) and 10 CFR 32.210.

Section 351.430 Inspection, Maintenance, and Opening of a Sealed Source or Source Holder

a) Each licensee or registrant shall visually check source holders, logging tools, and source handling tools for defects before each use to ensure that the equipment is in good working condition and required labeling is present. If defects are found, the equipment shall be removed from service until repaired and a record must be made listing the date of the check, name of the inspector, equipment involved, defects found, and repairs made. Records shall be retained for 3 years after the defect is found.

b) Each licensee or registrant shall have a program for semiannual visual inspection and routine maintenance of source holders, logging tools, injection tools, source handling tools, storage containers, transport containers, and uranium sinker bars to ensure that the required labeling is legible and no physical damage is visible. If defects are found, the equipment shall be removed from service until repaired and a record made listing the date, equipment involved, inspection and maintenance operations performed, any defects found, and any actions taken to correct the defects. Records shall be retained for 3 years after the defect is found.

c) Removal of a sealed source from a source holder or logging tool and maintenance on sealed sources or holders in which sealed sources are contained may not be performed by the licensee unless a written procedure developed pursuant to Section 351.630 has been approved by the Agency pursuant to Section 351.130(c) or by the U.S. Nuclear Regulatory Commission or an Agreement State.

d) If a sealed source is stuck in the source holder, the licensee may not perform any operation, such as drilling, cutting, or chiseling, on the source holder unless the licensee is specifically approved by the Agency, the U.S. Nuclear Regulatory Commission, or an Agreement State to perform this operation.

e) The repair, opening, or modification of any sealed source shall be performed only

by persons specifically authorized to do so by the Agency, the U.S. Nuclear Regulatory Commission, or an Agreement State.

Section 351.450 Subsurface Tracer Studies

a) All personnel handling radioactive tracer material shall be required to use protective gloves and, if required by the license, other protective clothing and equipment. Precautions shall be taken by the licensee to avoid ingestion or inhalation of radioactive tracer material and to avoid contamination of field stations and temporary jobsites.

b) A licensee may not knowingly inject licensed material into fresh water aquifers without specific license authorization issued by the Agency pursuant to 32 Ill. Adm. Code 330.250. The authorization will be issued only if the Applicant's proposed procedures will:

1) Prevent tracer concentrations at the most exposed drinking water source or public water supply inlet from exceeding the Illinois Pollution Control Board's maximum contaminant levels for radionuclides in 35 Ill. Adm. Code 611.330; and

2) Be performed:

A) On an underground injection well for which a U.S. Environmental Protection Agency underground injection control program permit has been issued pursuant to 40 CFR 124 or 40 CFR 144, 35 Ill. Adm. Code 705, or 62 Ill. Adm. Code 240; or

B) On a well for which the Illinois Department of Natural Resources has approved a subsurface radioactive tracer study pursuant to 62 Ill. Adm. Code 240.

Section 351.470 Radioactive Markers

A licensee or registrant may use radioactive markers in wells only if the individual markers contain quantities of licensed material not exceeding the quantities specified in Appendix B of 32 Ill. Adm. Code Part 330. The use of markers is subject only to the requirements of Section 351.370.

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Section 351.490 Uranium Sinker Bars

A licensee or registrant may use a uranium sinker bar in well logging applications only if it is legibly impressed with the words "CAUTION--RADIOACTIVE--DEPLETED URANIUM" and "NOTIFY CIVIL AUTHORITIES (or COMPANY NAME) IF FOUND."

Section 351.510 Use of a Sealed Source in a Well Without Surface Casing

The licensee may use a sealed source in a well without a surface casing for protecting fresh water aquifers only if the licensee follows a procedure for reducing the probability of the sealed source becoming lodged in the well. The procedure shall be approved by the Agency pursuant to Section 351.130(c) or by the U.S. Nuclear Regulatory Commission or an Agreement State.

Section 351.530 Energy Compensation Source (ECS)

a) The licensee may use an ECS that is contained within a logging tool, or other tool components only if the ECS contains quantities of licensed material not exceeding 3.7 MBq (100 microCi).

b) For well logging applications with a surface casing for protecting fresh water aquifers, use of the ECS is only subject to the requirements of Sections 351.350, 351.370, and 351.390.

c) For well logging applications without a surface casing for protecting fresh water aquifers, use of the ECS is subject to the requirements of Sections 351.150, 351.350, 351.370, 351.390, 351.510, and 351.770.

Section 351.550 Tritium Neutron Generator Target Source

a) Use of a tritium neutron generator target source, containing quantities not exceeding 1,110 GBq (30 Ci) in a well with a surface casing to protect fresh water aquifers, is subject to the requirements of this Part except Sections 351.150, 351.410, and 351.770.

b) Either use of a tritium neutron generator target source containing quantities exceeding 1,110 GBq (30 Ci) or in a well without a surface casing to protect fresh water aquifers is subject to the requirements of this Part, except Section 351.410.

SUBPART D: RADIATION SAFETY REQUIREMENTS

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Section 351.610 Training

a) No licensee or registrant shall permit any individual to act as a logging supervisor as defined in this Part until the individual has:

1) Completed 24 hours of training in the subjects outlined in Section 351.Appendix A;

2) Read and received instruction in the regulations contained in this Part and the applicable Sections of 32 Ill. Adm. Code 310, 340, and 400; the license under which the logging supervisor will perform well logging; and the licensee's or registrant's operating and emergency procedures required by Section 351.630;

3) Completed on-the-job training and demonstrated competence in the use of licensed materials, remote handling tools, and radiation survey instruments by a field evaluation; and

4) Demonstrated understanding of the requirements in subsections (a)(1) and (2) by successfully completing a written exam.

b) No licensee or registrant shall permit any individual to act as a logging assistant until the individual has:

1) Received instruction in the applicable Sections of 32 Ill. Adm. Code 340 and 400;

2) Received copies of, and instruction in, the licensee's operating and emergency procedures required by Section 351.630;

3) Demonstrated understanding of the materials listed in subsections (b)(1) and (2) by successfully completing a written or oral exam; and

4) Received instruction in the use of licensed material, remote handling tools, and radiation survey instruments, as appropriate for the logging assistant's intended job responsibilities.

c) The licensee or registrant shall provide safety reviews for logging supervisors and

logging assistants at least once during each calendar year.

d) The licensee or registrant shall maintain a record of each logging supervisor's and logging assistant's training and annual safety review. The training records shall include copies of written tests and dates of oral tests given after July 14, 1987. The training records shall be retained until 3 years following the termination of employment. Records of annual safety reviews shall list the topics discussed and be retained for 3 years.

Section 351.630 Operating and Emergency Procedures

Each licensee or registrant shall develop and follow written operating and emergency procedures that cover at least the following:

a) Handling and use of licensed material, including the use of sealed sources in wells without a surface casing for protecting fresh water aquifers, if appropriate;

b) The use of remote handling tools for handling sealed sources and radioactive tracer material except for low-activity calibration sources;

c) Methods and occasions for conducting radiation surveys, including surveys for detecting contamination as required by Sections 351.670(c) through (e);

d) Minimizing personnel exposure, including exposures from inhalation and ingestion of licensed tracer materials;

e) Methods and occasions for locking and securing stored licensed material;

f) Personnel monitoring and the use of personnel monitoring equipment;

g) Transportation of licensed materials to field stations or temporary jobsites, packaging of licensed materials for transport in vehicles, placarding of vehicles when needed, and physically securing licensed materials in transport vehicles during transportation to prevent accidental loss, tampering, or unauthorized removal;

h) Picking up, receiving, and opening packages containing licensed material, in accordance with 32 Ill. Adm. Code 340.960;

i) For the use of tracers, decontamination of the environment, equipment, and personnel;

j) Maintenance of records generated by logging personnel at temporary jobsites;

k) Inspection and maintenance of sealed sources, source holders, logging tools, injection tools, source handling tools, storage containers, transport containers, and uranium sinker bars as required by Section 351.430;

l) Identifying and reporting to the Agency defects and noncompliance as required by 32 Ill. Adm. Code 340;

m) Actions to be taken if a sealed source is lodged in a well;

n) Procedure for notifying proper personnel in the event of an accident; and

o) Actions to be taken if a sealed source is ruptured, including actions to prevent the spread of contamination, minimize the inhalation and ingestion of licensed material, and obtain suitable radiation survey instruments as required by Section 351.330(b).

Section 351.650 Personnel Monitoring

a) No licensee or registrant shall permit any individual to act as a logging supervisor or logging assistant unless each individual wears an individual monitoring device (i.e., personnel dosimeter) at all times during the handling of licensed radioactive material. Each personnel dosimeter shall be assigned to and worn by only one individual. Film badges shall be replaced at least monthly and all other personnel dosimeters that require replacement shall be replaced at least quarterly. All personnel dosimeters shall be evaluated at least quarterly or promptly after replacement, whichever is more frequent.

b) The licensee shall provide bioassay services to individuals using licensed materials in subsurface tracer studies if required by the license.

c) The licensee shall retain records of personnel dosimeters required by subsection (a) and bioassay results in accordance with 32 Ill. Adm. Code 340.1160.

Section 351.670 Radiation Surveys

a) The licensee shall make radiation surveys, including but not limited to the surveys required under subsections (b) through (e), of each area where licensed material is used and stored.

b) Before transporting licensed material, the licensee shall make a radiation survey of the position occupied by each person in the vehicle and of the exterior of each vehicle used to transport the licensed material. The surveys and calculations shall include each source of radiation or combination of sources to be transported in the vehicle.

c) If the sealed source assembly is removed from the logging tool before departure from the temporary jobsite, the licensee shall confirm that the logging tool is free of contamination by energizing the logging tool detector or by using a survey meter.

d) If the licensee has reason to believe that, as a result of any operation involving a sealed source, the encapsulation of the sealed source could be damaged by the operation, the licensee shall conduct a radiation survey, including a contamination survey, during and after the operation.

e) The licensee shall make a radiation survey at the temporary jobsite before and after each subsurface tracer study to confirm the absence of contamination.

f) The results of the radiation surveys required under subsections (a) through (e) must be recorded and shall include the date of the survey, the names of the individuals making the survey, the identification of the survey instruments used, and an exact description of the location of the survey. The licensee shall retain records of these radiation surveys for inspection by the Agency for 5 years after completion of the survey.

Section 351.690 Radioactive Contamination Control

a) If the licensee detects evidence that a sealed source has ruptured or licensed material has caused contamination, the licensee shall immediately initiate the emergency procedures required by Section 351.630.

b) If contamination results from the use of licensed material in well logging, the licensee shall decontaminate all work areas, equipment, and unrestricted areas.

c) During efforts to recover a sealed source lodged in the well, the licensee shall continuously monitor, with an appropriate radiation detection instrument or a logging tool with a radiation detector, the circulating fluids from the well, if any, to check for contamination resulting from damage to the sealed source.

Section 351.695 Particle Accelerators

No licensee or registrant shall permit above-ground testing of particle accelerators, designed for use in well logging, which results in the production of radiation, except in areas or facilities controlled or shielded so that the requirements of 32 Ill. Adm. Code 340.210 and 340.310, as applicable, are met.

SUBPART E: SECURITY, RECORDS, NOTIFICATIONS

Section 351.710 Security

a) A logging supervisor shall be physically present at a temporary jobsite whenever licensed materials are being handled or are not stored and locked in a vehicle or storage place. The logging supervisor may leave the jobsite to obtain assistance if a source becomes lodged in a well and another logging supervisor or logging assistant trained under this Part has been designated to provide oversight.

b) During well logging, except when radiation sources are below ground or in shipping or storage containers, the logging supervisor or other individual designated by the logging supervisor shall maintain direct surveillance of the operation to prevent unauthorized entry into a restricted area, as defined in 32 Ill. Adm. Code 310.

Section 351.730 Documents and Records Required at Field Stations

Each licensee or registrant shall maintain, for inspection by the Agency, the following documents and records for the specific devices and sources used at the field station:

a) A copy of this Part and 32 Ill. Adm. Code 340 and 400;

b) A copy of the license or certificate of registration, as applicable;

c) Operating and emergency procedures required by Section 351.630;

d) Records of the latest survey instrument calibrations required by Section 351.330;

e) The record of leak test results required by Section 351.350, including the dates they were performed on the sealed sources and the test results;

f) Physical inventory records required by Section 351.370;

g) Use records required by Section 351.390;

h) Records of inspection and maintenance required by Section 351.430;

i) Training records required by Section 351.610(d); and

j) Radiation survey records required by Section 351.670.

Section 351.750 Documents and Records Required at Temporary Jobsites

Each licensee or registrant conducting operations at a temporary jobsite shall have the following documents and records available at that site for inspection by the Agency:

a) Operating and emergency procedures required by Section 351.630;

b) Evidence of the most recent calibration of the radiation survey instruments in use at the jobsite as required by Section 351.330;

c) The latest radiation survey records required by Section 351.670(b), (c), and (e) for the period of operation at the site;

d) The shipping papers for the transportation of radioactive material required by 32 Ill. Adm. Code 341;

e) When operating in the State under reciprocity as provided for in 32 Ill. Adm. Code 330.900, a copy of the appropriate license, certificate of registration, or equivalent documents authorizing the use of licensed material;

f) The dates and results of the most recent tests for leakage or contamination performed on the sealed sources; and

g) A copy of the licensee's radioactive material license, including all appropriate amendments.

Section 351.770 Notification of Incidents and Lost Sources; Abandonment Procedures for Irretrievable Sources

a) The licensee shall immediately notify the Agency by telephone and, subsequently within 30 days, by confirmation in writing, using an appropriate method listed in 32 Ill. Adm. Code 310.110, if the licensee knows or has reason to believe that a sealed source has been ruptured. The written confirmation shall designate the well or other location, describe the magnitude and extent of the escape of licensed material, assess the consequences of the rupture, and explain efforts planned or being taken to mitigate these consequences.

b) The licensee shall notify the Agency of the theft or loss of radioactive material, radiation overexposures, excessive levels and concentrations of radiation, and certain other accidents as required by 32 Ill. Adm. Code 340.1205, 340.1210, 34.1220, and 340.1230.

c) If a sealed source becomes lodged in a well, and when it becomes apparent that efforts to recover the sealed source will not be successful, the licensee shall:

1) Notify the Agency by telephone at (217) 782-7860 of the circumstances that resulted in the inability to retrieve the source and:

A) Obtain Agency approval to implement abandonment procedures; or

B) Explain that the licensee implemented abandonment procedures before receiving Agency approval because the licensee believed there was an immediate threat to public health and safety;

2) Advise the well owner or operator, as appropriate, of the abandonment procedures under subsection 351.150(a) or (c); and

3) Either ensure that abandonment procedures are implemented within 30 days after the sealed source has been classified as irretrievable or request an extension of time if unable to complete the abandonment procedures.

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d) The licensee shall, within 30 days after a sealed source has been classified as irretrievable, make a report in writing to the Agency. The licensee shall send a copy of the report to each appropriate State or federal agency that issued permits or otherwise approved of the drilling operation. The report shall contain the following information:

1) Date of occurrence;

2) A description of the irretrievable well logging source involved, including radionuclide, quantity, and chemical and physical form;

3) Surface location and identification of well;

4) Results of efforts to immobilize and seal the source in place;

5) A brief description of the attempted recovery effort;

6) Depth of the radioactive source;

7) Depth of the top of the cement plug;

8) Depth of the well;

9) The immediate threat to public health and safety justification for implementing abandonment if prior Agency approval was not obtained under subsection (c)(1)(A);

10) Any other information, such as a warning statement, contained on the permanent identification plaque; and

11) A list of the State and federal agencies receiving a copy of this report.

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Section 351.APPENDIX A Subjects To Be Included In Training Courses For Logging Supervisors

AGENCY NOTE: Licensees may wish to refer to Section 8.8 and Appendix F of the U.S. Nuclear Regulatory Commission's NUREG 1556 Volume 14, Rev. 1 for additional guidance on training requirements, expectations on course length, duration of on-the-job training for both well logging supervisors and logging assistants, instructor minimum qualifications, and additional information to be submitted for Agency evaluation.

a) Fundamentals of Radiation Safety

1) Characteristics of radiation

2) Units of radiation dose and quantity of radioactivity

3) Significance of radiation dose

A) Radiation protection standards

B) Biological effects of radiation dose

4) Levels of radiation from licensed material

5) Methods of minimizing radiation dose

A) Working time

B) Working distances

C) Shielding

6) Radiation safety practices, including prevention of contamination, and methods of decontamination.

b) Radiation Detection Instrumentation to be Used

1) Use of radiation survey instruments

A) Operation

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B) Calibration

C) Limitations

2) Radiation Survey Techniques

3) Use of personnel monitoring equipment

c) Equipment to be Used

1) Operation of equipment, including source handling equipment and remote handling tools;

2) Storage, control, and disposal of licensed material; and

3) Maintenance of equipment

d) The Requirements of Pertinent State Regulations

e) Case histories of accidents in well logging.

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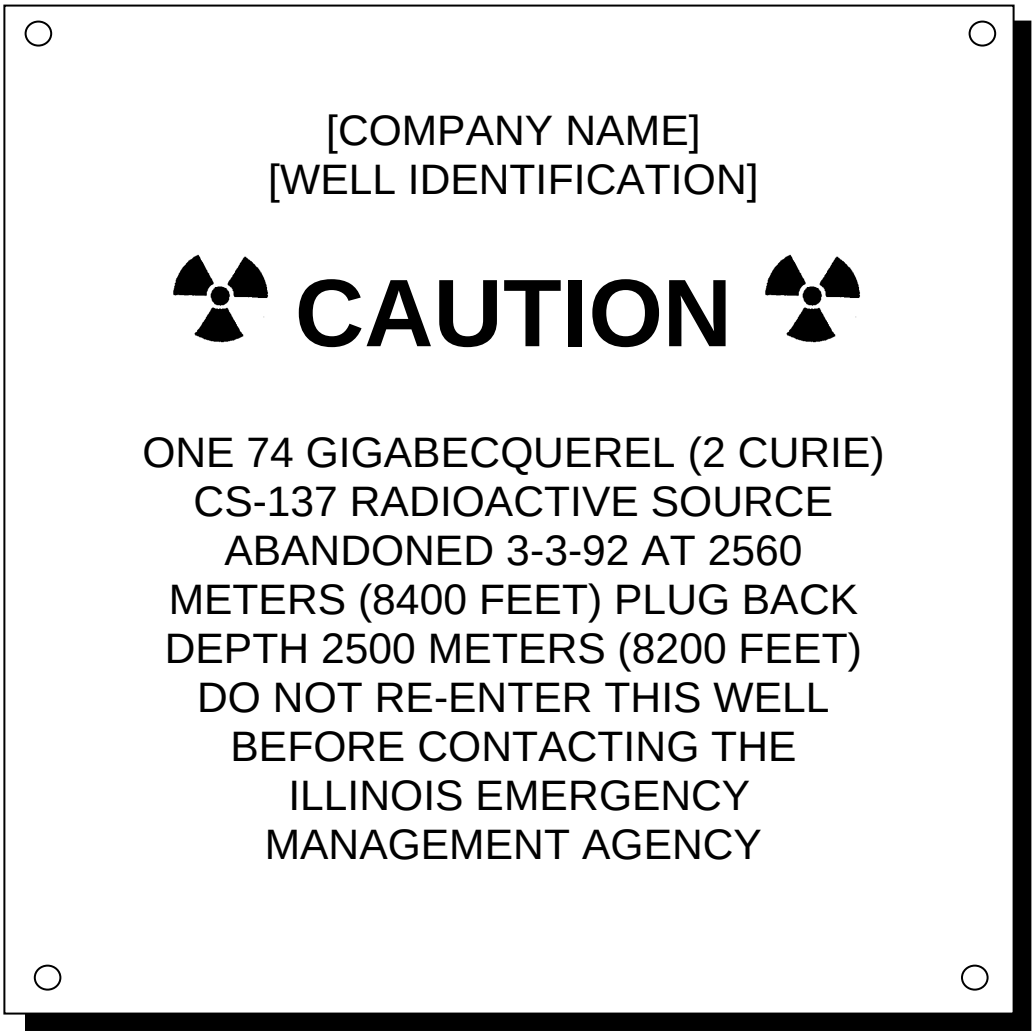
Section 351.APPENDIX B Example of Plaque for Identifying Wells Containing Sealed Sources Containing Radioactive Material Abandoned Downhole



The size of the plaque should be convenient for use on active or inactive wells, e.g., a 17-centimeter (7-inch) square and 3 mm (⅛ inch) thick. Letter size of the word "CAUTION" should be approximately twice the letter size of the rest of the information, e.g., 12-millimeter (½-inch) and 6-millimeter (¼-inch) letter size, respectively. Quantities and distances may be expressed either in SI units or in special and English units or in dual units.