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Rule R313-36. Special Requirements for Industrial Radiographic Operations.

As in effect on July 1, 2001

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R313-36-1. Purpose and Authority.

(1) The rules in R313-36 prescribe requirements for the issuance of licenses and establish radiation safety requirements for persons utilizing sources of radiation for industrial radiography.

(2) The rules set forth herein are adopted pursuant to the provisions of Sections 19-3-104(3) and 19-3-104(6).

(3) The requirements of R313-36 are in addition to, and not in substitution for, the other requirements of these rules.

R313-36-2. Scope.

(1) The requirements of R313-36 shall apply to licensees using radioactive materials to perform industrial radiography.

(2) The requirements of R313-36 shall not apply to persons using electronic sources of radiation to conduct industrial radiography.

R313-36-3. Clarifications or Exceptions.

For purposes of R313-36, 10 CFR 34 (2001), is incorporated by reference with the following clarifications or exceptions:

(1) The exclusion of the following 10 CFR sections: "34.1", "34.5", "34.8", "34.11", "34.121", and "34.123";

(2) The exclusion of "10 CFR 34.45(a)(9)";

(3) The exclusion of the following 10 CFR references within 10 CFR 34: "21", "30.7", "30.9", and

"30.10";

(4) The exclusion of "offshore" in 10 CFR 34.3 definition for "offshore platform radiography";

(5) The substitution of the following wording:

(a) "Utah Radiation Control Rules" for the reference to:

(i) "Commission's regulations", except as stated in R313-36-3(5)(f);

(ii) "Federal regulations"; and

(iii) "NRC regulations";

(b) "Executive Secretary" for the reference to "Commission", except as stated in 10 CFR 34.20 and R313-36-3(5)(c)(iv);

(c) "Executive Secretary, U.S. Nuclear Regulatory Commission, or an Agreement State" for references to:

(i) "NRC or an Agreement State";

(ii) "Commission or by an Agreement State";

(iii) "Commission or an Agreement State"; and

(iv) "Commission" in 10 CFR 34.43(a)(2);

(d) "License" for reference to "NRC license(s)";

(e) In 10 CFR 34.27(d), "reports of test results for leaking or contaminated sealed sources shall be made pursuant to R313-15-1208.", for reference to the following statements:

(i) "A report must be filed with the Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, within 5 days of any test with results that exceed the threshold in this subsection, describing the equipment involved, the test results, and the corrective action taken."; and

(ii) "A copy of the report must be sent to the Administrator of the appropriate Nuclear Regulatory Commission's Regional Office listed in appendix D of 10 CFR part 20 of this chapter "Standards for Protection Against Radiation.";

(f) In 10 CFR 34.27(d), "R313-15-401(6)" for the reference to "Commission regulations";

(g) In 10 CFR 34.89, "a U.S. Nuclear Regulatory Commission or an Agreement State" for the reference to "the Agreement State";

(h) In 10 CFR 34.101(a), "Executive Secretary" for the following wording:

(i) "U.S. Nuclear Regulatory Commission, Division of Industrial and Medical Nuclear Safety, Washington, D.C. 20555-0001, with a copy to the Director, Office for Analysis and Evaluation of

Operational Data, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555-0001";

(i) In 10 CFR 34.101(c), "Executive Secretary" for the reference to "appropriate NRC regional office listed in 10 CFR 30.6(a)(2) of this chapter";

(j) In Item 12, Section I of Appendix A to 10 CFR 34, "Executive Secretary, the U.S. Nuclear Regulatory Commission and other independent certifying organizations and/or Agreements States" for the reference to "Commission and other independent certifying organizations and/or Agreement States";

(k) In Item 1, Section II of Appendix A to 10 CFR 34, "equivalent U.S. Nuclear Regulatory Commission or Agreement State regulations" for the reference to "equivalent Agreement State regulations"; and

(l) In Item 2(c), Section II of Appendix A to 10 CFR, "a Utah, U.S. Nuclear Regulatory Commission, or an Agreement State licensee" for the reference to "an Agreement State or a NRC licensee"; and

(6) The substitution of the following R313 references for specific 10 CFR references:

(a) "R313-12-55(1)" for reference to "10 CFR 34.111";

(b) "R313-15" for the reference to "10 CFR 20";

(c) "R313-15-601(1)(a)" for the reference to "10 CFR 20.1601(a)(1)";

(d) "R313-15-902" for the reference to "10 CFR 20.1902";

(e) "R313-15-903" for the reference to "10 CFR 20.1903";

(f) "R313-15-1203" for the reference to "10 CFR 20.2203";

(g) "R313-18" for the reference to "10 CFR 19";

(h) "R313-19-30" for the reference to "10 CFR 150.20";

(i) "R313-19-50" for the reference to "10 CFR 30.50";

(j) "R313-19-100" for the reference to "10 CFR 71", "10 CFR 71.5", and "49 CFR 171 to 173";

(k) "R313-22-33" for the reference to "10 CFR 30.33"; and

(l) "R313-36" for the reference to "10 CFR 34."

KEY

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Rule converted into HTML by the Division of Administrative Rules.

For questions regarding the *content* or *application* of rules under Title R313, please contact the promulgating agency (Environmental Quality, Radiation Control). A list of agencies with links to their homepages is available at http://www.state.ut.us/government/agencylist.html.

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Rule R313-38. Radiation Safety Requirements for Wireline Service Operation and Subsurface Tracer Studies.

As in effect on July 1, 2001

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R313-38-1. Purpose and Authority.

R313-38 establishes radiation safety requirements for persons using sources of radiation for wireline service operations including mineral logging, radioactive markers, and subsurface tracer studies. The requirements of R313- 38 are in addition to, and not in substitution for, the requirements of R313-12, R313-15, R313-16, R313-18 and R313-19. The rules in R313-38 apply to all licensees or registrants who use sources of radiation for wireline service operations including mineral logging, radioactive markers, or subsurface tracer studies.

R313-38-2. Definitions.

As used in R313-38:

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

"Fresh water aquifer" means a geologic 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 a sealed source containing licensed 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 an individual who, under the personal supervision of a logging supervisor, handles sources of radiation or tracers that are not in logging tools or shipping containers or who performs surveys required by R313-38-67.

"Logging supervisor" means an individual who uses sources of radiation or provides personal supervision in the use of sources of radiation at a temporary job site and who is responsible to the licensee or registrant for assuring compliance with the Utah Radiation Control Rules and the conditions of the license.

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

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

"Radioactive marker" means radioactive material placed subsurface or on a structure intended for subsurface use for the purpose of depth determination or direction orientation. For purposes of R313-38, 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.

"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.

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

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

"Well logging" means the lowering and raising of measuring devices or tools which contain sources of radiation into well-bores or cavities for the purpose of obtaining information about the well or adjacent geological formations.

"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.

R313-38-13. Specific Licenses for Well Logging.

The Executive Secretary will approve an application for a specific license for the use of licensed material in well logging if the applicant meets the following requirements:

(1) The applicant shall satisfy the general requirements specified in R313-22-34 and the special requirements contained in R313-38.

(2) The applicant shall develop a program for training logging supervisors and logging assistants and submit to the Executive Secretary a description of this program which specifies the:

(a) initial training;

(b) on-the-job training;

(c) annual safety reviews provided by the licensee;

(d) methods that the applicant will use to evaluate the logging supervisor's knowledge and understanding of and ability to comply with these rules and licensing requirements and the applicant's operating and emergency procedures; and

(e) methods that the applicant will use to evaluate the logging assistant's knowledge and understanding of and ability to comply with the applicant's operating and emergency procedures.

(3) The applicant shall submit to the Executive Secretary written operating and emergency procedures, as described in R313-38-63, or an outline or summary of the procedures that includes the important radiation safety aspects of the procedures.

(4) The applicant shall establish and submit to the Executive Secretary its program for annual inspections of the job performance of logging supervisors to ensure that these rules, license requirements, and the applicant's operating and emergency procedures are followed. Inspection records must be retained for three years after annual internal inspections.

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

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

(1) instruments to be used;

(2) methods of performing the analysis; and

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

R313-38-15. Agreement With Well Owner or Operator.

(1) 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. The following requirements shall be met and the written agreement shall identify who will be responsible for meeting these requirements.

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

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

(c) The radiation monitoring required in R313-38-69(3) will be performed.

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

(e) 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:

(i) Irretrievable well logging sources must be immobilized and sealed in place with a cement plug.

(ii) A mechanical device to prevent inadvertent intrusion on the source must be set at some point in the well above the cement plug, unless the cement plug and source are not accessible to subsequent drilling operations.

(iii) A permanent identification plaque, constructed of long lasting material such as stainless steel, brass, bronze, or monel, must 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 centimeters (seven inches) square and three millimeters (one-eighth inch) thick. The plaque must contain:

(A) the word "CAUTION";

(B) the radiation symbol (the color requirement in R313-15-901(1) need not be met);

(C) the date the source was abandoned;

(D) the name of the well owner or well operator, as appropriate;

(E) the well name and well identification number or other designation;

(F) an identification of the sealed source by radionuclide and quantity;

(G) the depth of the source and depth of the top of the plug; and

(H) an appropriate warning, such as, "DO NOT RE-ENTER THIS WELL."

(2) The licensee shall retain a copy of the written agreement for three years after the completion of the well logging operation.

(3) On a case by case basis, a licensee may apply for Executive Secretary approval pursuant to R313- 38-91 of proposed procedures to abandon an irretrievable well logging source in a manner not otherwise authorized in R313- 38-15(1)(e).

(4) 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 otherwise meet the requirements in R313-38-15(1)(a) through (e).

R313-38-17. Request for Written Statements.

Licenses are issued with the condition that the licensee will, prior to expiration of the license, upon the Executive Secretary's request, submit written statements, signed under oath or affirmation, to enable the Executive Secretary to determine whether or not the license should be modified, suspended, or revoked.

R313-38-20. Limits on Levels of Radiation.

Sources of radiation shall be used, stored, and transported in a manner that meets the transportation requirements in R313-19-100 and the dose limitation requirements of R313-15.

R313-38-31. Labels, Security, and Transportation Precautions.

(1) Labels.

(a) 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 R313-15-901(1), without the color requirements, and the wording "CAUTION (or DANGER) RADIOACTIVE MATERIAL."

(b) The licensee may not use a container to store licensed material unless the container has securely attached to it a durable, legible, and clearly visible label. The label must contain the

radiation symbol specified in R313-15-901(1), and the wording "CAUTION (or DANGER) RADIOACTIVE MATERIAL, NOTIFY CIVIL AUTHORITIES (or NAME OF COMPANY)."

(c) The licensee may not transport licensed material unless the material is packaged, labeled, marked, and accompanied with appropriate shipping papers in accordance with rules set out in R313-19-100.

(2) Security Precautions During Storage and Transportation.

(a) The licensee shall store sources containing licensed material in a storage container or transportation package. The container or package must 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.

(b) 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.

R313-38-33. Radiation Detection Instruments.

(1) The licensee or registrant shall keep a calibrated and operable radiation survey instrument capable of detecting beta and gamma radiation at field stations and temporary job sites to make the radiation surveys required by R313-38-67 and by R313-15-501. To satisfy this requirement, the radiation survey instrument must be capable of detecting dose rates over the range of one microsievert (0.1 mrem) per hour to at least 0.5 millisievert (50 mrem) per hour.

(2) The licensee or registrant 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 or registrant may own the instruments or may have a procedure to obtain them quickly from a second party.

(3) The licensee or registrant shall have radiation survey instruments required under R313-38-33(1) calibrated:

(a) at intervals not to exceed six months and after instrument servicing;

(b) for linear scale instruments, at two points located approximately one-third and two-thirds of full-scale; for logarithmic scale instruments, at midrange of the decades, and at two points of at least one decade; and for digital instruments, at appropriate points; and

(c) so that an accuracy within plus or minus 20 percent of the calibration standard can be demonstrated on the scales.

(4) The licensee or registrant shall retain calibration records for a period of three years after the date of calibration for inspection by a representative of the Board or the Executive Secretary.

R313-38-35. Leak Testing of Sealed Sources.

(1) Testing and recordkeeping. Licensees using sealed sources of radioactive material shall have the sources tested for leakage. Records of leak test results shall be kept in units of

kilobecquerels (uCi) and maintained for inspection by a representative of the Board or the Executive Secretary for three years after the leak test is performed.

(2) Method of Testing. Tests for leakage shall be performed only by persons specifically authorized to perform those tests by the Executive Secretary, the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State. The test sample shall be taken from the surface of the source, source holder, or from the surface of the device in which the source is stored or mounted and on which one might expect contamination to accumulate. The test sample shall be analyzed for radioactive contamination, and the analysis shall be capable of detecting the presence of 185 becquerels (0.005 uCi) of radioactive material on the test sample.

(3) Interval of Testing. Sealed sources of radioactive material shall be tested at intervals not to exceed six months or at alternative intervals approved by the Executive Secretary, an Agreement State, a Licensing State, or the U.S. Nuclear Regulatory Commission. In the absence of a certificate from a transferor indicating that a test has been made prior to the transfer, the sealed source shall not be put into use until tested. If it is suspected that a sealed source may be leaking, it shall be removed from service immediately and tested for leakage as soon as practical.

(4) Removal of Leaking or Contaminated Sources. If the test reveals the presence of 185 becquerels (0.005 uCi) or more of leakage or contamination, the licensee shall immediately withdraw the source from use and shall cause it to be decontaminated, repaired, or disposed of in accordance with R313-15. A report shall be filed with the Executive Secretary in accordance with R313-15-1208.

(5) Exemptions. The following sources are exempt from the periodic leak test requirements of R313- 38-35(1) through (4):

(a) hydrogen-3 sources;

(b) sources of radioactive material with a half-life of 30 days or less;

(c) sealed sources of radioactive material in gaseous form;

(d) sources of beta or gamma emitting radioactive material with an activity of 3.7 megabecquerels (100 uCi) or less; and

(e) sources of alpha-emitting radioactive material with an activity of 370 kilobecquerels (10 uCi) or less.

R313-38-37. Physical Inventory.

At intervals not to exceed six months licensees or registrants shall conduct a physical inventory to account for all sources of radiation received and possessed under the license. The licensee or registrant shall retain records of the inventory for three years from the date of the inventory for inspection by a representative of the Board or the Executive Secretary. The inventory must indicate the quantity and kind of licensed material, the location of the licensed material, the date of the inventory, and the name of the individual conducting the inventory. Physical inventory records may be combined with leak test records.

R313-38-39. Records of Use.

(1) Licensees or registrants shall maintain records for uses of sources of radiation showing:

(a) the make, model number, and a serial number or a description of sources of radiation used;

(b) 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 unused tracer materials;

(c) the identity of the logging supervisor who is responsible for the sources of radiation and the identity of logging assistants present;

(d) the location and date of use.

(2) The licensee or registrant shall make the records required by R313-38-39(1) available for inspection by a representative of the Board or the Executive Secretary. The licensee or registrant shall retain the records for three years from the date of the recorded event.

R313-38-41. Design, Performance, and Certification Criteria for Sealed Sources Used in Downhole Operations.

(1) Sealed sources, except those containing radioactive material in gaseous form, used in downhole operations, and manufactured after January 1, 1982, shall be certified by the manufacturer, or other testing organization acceptable to the Executive Secretary, to meet the following minimum criteria:

(a) be of doubly encapsulated construction;

(b) contain radioactive material whose chemical and physical forms are as insoluble and non-dispersible as practical; and

(c) the sealed source's prototype has been tested and found to maintain its integrity after the following tests:

(i) temperature: the test source must be held at -40 degrees Celsius for 20 minutes, 600 degrees Celsius for one hour, and then be subject to a thermal shock test with a temperature drop from 600 degrees Celsius to 20 degrees Celsius within 15 seconds.

(ii) impact test: a five kilogram steel hammer, 2.5 centimeter in diameter, must be dropped from a height of one meter onto the test source.

(iii) vibration test: the test source must be subject to a vibration from 25 hertz to 500 hertz at five gravitational units amplitude for 30 minutes.

(iv) puncture test: a one gram hammer and pin, 0.3 centimeter pin diameter, must be dropped from a height of one meter onto the test source.

(v) pressure test: has been individually pressure tested to at least 24,600 pounds per square inch absolute (1.695×10^8 pascals) without failure.

(2) For sealed sources, except those containing radioactive material in gaseous form, acquired after July 14, 1989, in the absence of a certificate from a transferor certifying that an individual

sealed source meets the requirements of R313-38-41(1), the sealed source shall not be put into use until the determinations and testing have been performed.

(3) Sealed sources, except those containing radioactive material in gaseous form, used in downhole operations after July 14, 1989, shall be certified by the manufacturer, or other testing organization acceptable to the Executive Secretary, as meeting the sealed source performance requirements for oil well logging as contained in the American National Standard N43.6, "Classification of Sealed Radioactive Sources" in effect on July 14, 1989.

(4) Certification documents shall be maintained for inspection by a representative of the Board or the Executive Secretary for a period of two years after source disposal. If the source is abandoned downhole, the certification documents shall be maintained until the Executive Secretary authorizes disposition.

R313-38-43. Inspection, Maintenance, and Opening of a Source or Source Holder.

(1) Licensees or registrants shall visually check source holders, logging tools, and source handling tools, for defects before use, to ensure that the equipment is in good working condition and that required labeling is present. If defects are found, the equipment must be removed from service until repaired, and a record must be retained for three years after the defect is found.

(2) Licensees or registrants 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 that no physical damage is visible. If defects are found, the equipment must be removed from service until repaired, and a record must be made listing: date, equipment involved, inspection and maintenance operations performed, defects found, and actions taken to correct the defects. These records must be retained for three years after the defect is found.

(3) 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 R313-38-63 has been approved by the Executive Secretary, the Nuclear Regulatory Commission, or by an Agreement State.

(4) If a sealed source is stuck in the source holder, the licensee may not perform operations, like drilling, cutting, or chiseling, on the source holder unless the licensee is specifically approved by the Executive Secretary, the Nuclear Regulatory Commission or an Agreement State to perform this operation.

(5) The opening, repair, or modification of sealed sources must be performed by persons specifically approved to do so by the Executive Secretary, the Nuclear Regulatory Commission or an Agreement State.

R313-38-44. Handling Tools.

The licensee shall provide and require the use of tools that will assure remote handling of sealed sources other than low-activity calibration sources.

R313-38-45. Subsurface Tracer Studies.

(1) Protective gloves and appropriate protective clothing and equipment shall be used by personnel handling radioactive tracer material. Precautions shall be taken to avoid ingestion or inhalation of radioactive material.

(2) Licensees shall not cause the injection of radioactive material into fresh water aquifers without prior written authorization from the Executive Secretary and other appropriate State Agencies.

R313-38-47. Radioactive Markers.

The licensee may use radioactive markers in wells only if the individual markers contain quantities of licensed material not exceeding the quantities specified in R313-19-71. The use of markers is subject only to the requirements of R313-38-37.

R313-38-48. Particle Accelerators.

Licensees or registrants shall not 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 R313-15-201 and R313-15-301, as applicable, are met.

R313-38-49. Uranium Sinker Bars.

Licensees may use a uranium sinker bar in well logging after July 14, 1988, only if it is legibly impressed with the words "CAUTION - RADIOACTIVE-DEPLETED URANIUM" and "NOTIFY CIVIL AUTHORITIES (or COMPANY NAME) IF FOUND."

R313-38-51. Use of a Sealed Source in a Well Without a Surface Casing.

Licensees 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 source becoming lodged in the well. The procedures must be approved by the Executive Secretary, the Nuclear Regulatory Commission or an Agreement State.

R313-38-61. Training Requirements.

(1) Licensees or registrants shall not permit individuals to act as a logging supervisor as defined in R313-38 until the individual has complied with the following:

(a) received, in a course recognized by the Executive Secretary, the Nuclear Regulatory Commission, an Agreement State, or a Licensing State, instruction in the subjects outlined in R313-38-61(5) and demonstrated an understanding thereof by successfully completing a written test;

(b) read and received instruction in the rules contained in R313-38 and the applicable sections of R313-12, R313-15 and R313-18 or their equivalent, conditions of appropriate license or certificate of registration, and the licensee's or registrant's operating and emergency procedures, and demonstrated an understanding thereof; and

(c) has 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.

(2) Licensees or registrants shall not permit individuals to act as a logging assistant as defined in R313-38 until the individual has complied with the following:

(a) read or received instruction in the licensee's or registrant's operating and emergency procedures and documented an understanding thereof;

(b) has received instruction in applicable sections of R313-12, R313-15 and R313-18 or their equivalent;

(c) demonstrated competence to use, under the personal supervision of the logging supervisor, the sources of radiation, related handling tools, and radiation survey instruments which will be used on the job; and

(d) has demonstrated understanding of the materials listed in R313-38-61(2)(a) and (b) by successfully completing a written or oral test.

(3) Licensees or registrants shall provide safety reviews for logging supervisors and logging assistants at least annually.

(4) The licensee or registrant shall maintain a record on logging supervisors and logging assistants training and annual safety review. The training records must include copies of written tests and dates of oral tests given after January 1, 1989. The training records must be retained until three years following the termination of employment. Records of annual safety reviews must list the topics discussed and be retained for three years.

(5) The licensee or registrant shall include the following subjects in the training required in R313-38-61(1)(a).

(a) Fundamentals of radiation safety including:

(i) characteristics of radiation;

(ii) units of radiation dose and quantity of radioactivity;

(iii) hazards of exposure to radiation;

(iv) levels of radiation from licensed material;

(v) methods of controlling radiation dose (time, distance, and shielding); and

(vi) radiation safety practices, including prevention of contamination, and methods of decontamination.

(b) Radiation detection instruments including:

(i) use, operation, calibration, and limitations of radiation survey instruments;

(ii) survey techniques; and

(iii) use of personnel monitoring equipment.

(c) Equipment to be used including:

(i) operation of equipment, including source handling equipment and remote handling tools;

(ii) storage, control, and disposal of licensed material; and

(iii) maintenance of equipment.

(d) The requirements of pertinent federal and state rules.

(e) Case histories of accidents in well logging.

R313-38-63. Operating and Emergency Procedures.

Licensees or registrants shall develop and follow written operating and emergency procedures that cover the following:

(1) the handling and use of sources of radiation including the use of sealed sources in wells without surface casing for protecting fresh water aquifers, if appropriate;

(2) handling and use of sources of radiation to be employed so that no individual is likely to be exposed to radiation doses in excess of the standards established in R313-15;

(3) methods and occasions for conducting radiation surveys;

(4) methods and occasions for locking and securing sources of radiation;

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

(6) transportation to temporary job sites and field stations, including the packaging and placing of sources of radiation in vehicles, placarding of vehicles, and securing sources of radiation during transportation;

(7) minimizing exposure of individuals in the event of an accident;

(8) procedure for notifying proper personnel in the event of an accident;

(9) maintenance of records;

(10) inspection and maintenance of sealed sources, source holders, logging tools, source handling tools, storage containers, transport containers, injection tools, and uranium sinker bars;

(11) procedure to be followed in the event a sealed source is lodged downhole;

(12) procedures to be used for picking up, receiving, and opening packages containing radioactive material;

(13) for the use of tracers, procedures to be used for decontamination of the environment,

equipment, and personnel; and

(14) actions to be taken if a sealed source is ruptured including actions to prevent the spread of contamination and minimize inhalation and ingestion of licensed materials and actions to obtain suitable radiation survey instruments as required by R313-38-33.

R313-38-65. Personnel Monitoring.

(1) The licensee or registrant shall not permit an individual to act as the logging supervisor or logging assistant unless that person wears, at all times during the handling of sources of radiation, either a film badge or a thermoluminescent dosimeter (TLD). Film badges or TLD's must be assigned to and worn by only one individual. Film badges must be replaced at least monthly and TLD's replaced at least quarterly. After replacement, the film badges or TLD's must be promptly processed.

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

(3) The licensee or registrant shall retain records of film badge, TLD and bioassay results for inspection by a representative of the Board or the Executive Secretary.

R313-38-67. Radiation Surveys.

(1) The licensee shall make radiation surveys, including but not limited to, the surveys required under R313-38-67(2) through (6), of areas where licensed materials are used and stored.

(2) Before transporting licensed materials, the licensee shall make a radiation survey of the position occupied by individuals in the vehicle and of the exterior of a vehicle used to transport the licensed materials.

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

(4) If the licensee has reason to believe that, as a result of operations 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.

(5) The licensee shall make a radiation survey at the temporary job site before and after subsurface tracer studies to confirm the absence of contamination.

(6) The results of surveys required by R313-38-67(1) through (5) shall be recorded and must include the date of the survey, the name of the individual making the survey, the identification of the survey instrument used, and the location of the survey. The licensee shall retain records of surveys for three years after they are made, for inspection by a representative of the Board or the Executive Secretary.

R313-38-69. Radioactive Contamination Control.

(1) If the licensee detects evidence that a sealed source has ruptured or licensed materials have caused contamination, the licensee shall initiate immediately the emergency procedures

required by R313-38-63.

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

(3) 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 they are present, to check for contamination resulting from damage to the sealed source.

R313-38-71. Security.

(1) A logging supervisor shall be physically present at a temporary job site whenever licensed material is being handled or is not stored and locked in a vehicle or storage place. The logging supervisor may leave the job site in order to obtain assistance if a source becomes lodged in a well.

(2) During well logging, except when radiation sources are below ground or in shipping or storage containers, the logging supervisor or individual designated by the logging supervisor shall maintain direct surveillance of the operation to prevent unauthorized entry into a restricted area, as defined in R313-12-3.

R313-38-73. Documents and Records Required at Field Stations.

Licensees or registrants shall maintain, for inspection by a representative of the Board or the Executive Secretary, the following documents and records for the specific devices and sources used at the field station:

(1) appropriate license, certificate or registration, or equivalent document;

(2) operating and emergency procedures;

(3) a copy of R313-12, R313-15, R313-16, R313-18, R313-19 and R313-38 of the Utah Radiation Control rules, as applicable;

(4) records of the latest survey instrument calibrations pursuant to R313-38-33;

(5) records of the latest leak test results pursuant to R313-38-35;

(6) physical inventory records required pursuant to R313-38-37;

(7) utilization records required pursuant to R313-38-39;

(8) records of inspection and maintenance required pursuant to R313-38-43;

(9) training records required by R313-38-61; and

(10) survey records required pursuant to R313-38-67.

R313-38-75. Documents and Records Required at Temporary Job Sites.

Licensees or registrants conducting operations at a temporary job site shall have the following documents and records available at that site for inspection by a representative of the Board or the Executive Secretary:

(1) operating and emergency procedures;

(2) survey records required pursuant to R313-38-67 for the period of operation at the site;

(3) evidence of current calibration for the radiation survey instruments in use at the site; and

(4) when operating in the State under reciprocity, a copy of the appropriate license, certificate of registration, or equivalent document.

R313-38-77. Notification of Incidents, Abandonment, and Lost Sources.

(1) Notification of incidents and sources lost in other than downhole logging operations shall be made in accordance with appropriate provisions of R313-15.

(2) Whenever a sealed source or device containing radioactive material is lodged downhole, the licensee shall:

(a) monitor at the surface for the presence of radioactive contamination with a radiation survey instrument or logging tool during logging tool recovery operations; and

(b) notify the Executive Secretary immediately by telephone if radioactive contamination is detected at the surface or if the source appears to be damaged.

(3) When it becomes apparent that efforts to recover the radioactive source will not be successful, the licensee shall:

(a) advise the well owner or operator, as appropriate, of the Utah Radiation Control Rules regarding abandonment and an appropriate method of abandonment, which shall include:

(i) the immobilization and sealing in place of the radioactive source with a cement plug;

(ii) the setting of a whipstock or other deflection device; and

(iii) the mounting of a permanent identification plaque, at the surface of the well, containing the appropriate information required by R313-38-15(1)(e);

(b) notify the Executive Secretary by telephone, giving the circumstances of the loss, and request approval of the proposed abandonment procedures; and

(c) file a written report with the Executive Secretary within 30 days of the abandonment, setting forth the following information:

(i) date of occurrence and a brief description of attempts to recover the source;

(ii) a description of the radioactive source involved, including radionuclide, quantity, and chemical and physical form;

(iii) surface location and identification of well;

(iv) results of efforts to immobilize and set the source in place;

(v) depth of the radioactive source;

(vi) depth of the top of the cement plug;

(vii) depth of the well; and

(viii) information contained on the permanent identification plaque.

(4) The licensee shall immediately notify the Executive Secretary by telephone and subsequently by confirming letter if the licensee knows or has reason to believe that radioactive material has been lost in or to an underground potable water source. Notices shall designate the well location and shall describe the magnitude and extent of loss of radioactive material, assess the consequences of the loss, and explain efforts planning or being taken to mitigate these consequences.

R313-38-91. Exemptions.

The Executive Secretary may, upon application of interested persons or upon his initiative, grant exemptions from the requirements of the rules in R313-38 as he determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest.

R313-38-98. Example of Plaque for Identifying Wells Containing Sealed Sources Containing Radioactive Material Abandoned Downhole.

TABLE

"(COMPANY NAME)
(WELL IDENTIFICATION)
CAUTION
ONE - TWO CURIE CS-137 RADIOACTIVE SOURCE ABANDONED
March 3, 1975 AT 8400 FEET PLUG BACK DEPTH 8200 FEET
DO NOT RE-ENTER THIS WELL BEFORE CONTACTING
THE EXECUTIVE SECRETARY OF THE
UTAH RADIATION CONTROL BOARD"

The size of the plaque should be convenient for use on active or inactive wells, for example, a seven inch square letter size of the word "CAUTION" should be approximately twice the letter size of the rest of the information, or one-half inch and one-quarter inch letter size respectively.

KEY

radioactive material, well logging, wireline studies, subsurface tracer

Date of Enactment or Last Substantive Amendment

1994

Notice of Continuation

January 25, 1999

Authorizing, Implemented, or Interpreted Law

19-3-104; 19-3-113;

Rule converted into HTML by the Division of Administrative Rules.

For questions regarding the *content* or *application* of rules under Title R313, please contact the promulgating agency (Environmental Quality, Radiation Control). A list of agencies with links to their homepages is available at http://www.state.ut.us/government/agencylist.html.

For questions about the *rulemaking process*, please contact the Division of Administrative Rules at rulesonline@state.ut.us. *Please Note:* The Division of Administrative Rules is ***not able*** to answer questions about the content or application of these rules.

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Safety Requirements for Radiologic Equipment Part 34, (55 FR 843) effective date 1/4/94

R313. Environmental Quality, Radiation Control.
R313-36. Special Requirements for Industrial Radiographic Operations.
R313-36-1. Purpose and Scope.

The rules in [~~this chapter~~]R313-36 prescribe requirements for the issuance of licenses and establish radiation safety requirements for persons utilizing sources of radiation for industrial radiography. The requirements of [~~this chapter~~]R313-36 are in addition to, and not in substitution for, the other requirements of these rules. The rules in [~~this chapter~~]R313-36 apply to all licensees or registrants who use sources of radiation for industrial radiography. Except for those rules of [~~this chapter~~]R313-36 clearly applicable only to sealed radioactive sources, both radiation machines and sealed radioactive sources are covered by [~~this chapter~~]R313-36.

R313-36-2. Definitions.

As used in [~~this chapter~~]R313-36:

(1) "Cabinet radiography" means industrial radiography employing radiation machines conducted in an enclosure or cabinet so shielded that every exterior location meets the conditions specified in [~~R313-15-105 of these rules~~]R313-15-301.

(2) "Cabinet x-ray system" means an x-ray system with the x-ray tube installed in an enclosure (hereinafter termed "cabinet") which, independently of existing architectural structure 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 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.

(3) "Collimator" means a device used to limit the size, shape and direction of the primary radiation beam.

(4) "Enclosed radiography" means industrial radiography employing radiation machines conducted in an enclosed cabinet or room and includes cabinet radiography and shielded room radiography.

(5) "Industrial radiography" means the examination of the macroscopic structure of materials by nondestructive methods utilizing sources of radiation. Industrial radiography as used in [~~this chapter~~]R313-36 does not include well logging operations.

(6) "Permanent radiographic installation" means a shielded installation or structure designed or intended for radiography employing a radiographic exposure device and in which radiography is regularly performed.

(7) "Personal supervision" means supervision by a radiographer such that the radiographer is physically present at the radiography site and in such proximity that communication can be maintained and immediate assistance given as required. When a radiographer's assistant is using or handling sources of radiation, the radiographer must maintain direct surveillance.

(8) "Radiographer" means any individual who performs or personally supervises industrial radiographic operations and who is responsible to the licensee for assuring compliance with the requirements of these rules and all license conditions.

(9) "Radiographer's assistant" means any individual who, under the personal supervision of a radiographer, uses sources of radiation, related handling tools, or radiation survey instruments in industrial radiography.

(10) "Radiographer instructor" means any individual who has been authorized by the [~~Bureau~~]Executive Secretary to provide instruction to radiographer assistant in accordance with these rules.

(11) "Radiographic exposure device" means any instrument containing a sealed source fastened or contained therein, in which the sealed source or shielding thereof may be moved, or otherwise changed, from a shielded to unshielded position for purposes of making a radiographic exposure.

(12) "Residential location" means any area where structures in which people lodge or live are located, and the grounds on which such structures are located including, but not limited to, houses, apartments, condominiums, and garages.

(13) "Shielded-room radiography" means industrial radiography conducted in a room so shielded that radiation levels at every location on the exterior meet the limitations specified in these rules.

(14) "Storage area" means any location, facility, or vehicle which is used to store, to transport, or to secure a radiographic exposure device, a storage container, or a sealed source when it is not in use and which is locked or has a physical barrier to prevent accidental exposure, tampering with, or unauthorized removal of the device, container, or source.

(15) "Transport container" means a package that is designed to provide radiation safety and security when sealed sources are transported and meets all application requirements of the U.S. Department of Transportation.

R313-36-11. License Issuance.

(1) A specific license for use of sealed sources in industrial radiography will be issued if all of the following are complied with:

(a) The applicant will have an adequate program for training radiographers and radiographer's assistants and submits to the [~~Bureau~~]Executive Secretary a schedule or description of such program which specifies the:

(i) initial training;

(ii) periodic training;

(iii) on-the-job training;

(iv) means to be used by the licensee to determine the radiographer's knowledge and understanding of and ability to comply with [~~Bureau~~]Utah Radiation Control rules and licensing requirements, and the operating and emergency procedures of the applicant; and

(v) means to be used by the licensee to determine the radiographer's assistant's knowledge and understanding of the ability to comply with the operating and emergency procedures of the applicant.

(b) The applicant submits to the [~~Bureau~~]Executive Secretary and complies with satisfactory written operating and emergency procedures (described in R313-36-32 of these rules);

(c) The applicant has established and submits to the [~~Bureau~~]Executive Secretary a description of its inspection program adequate to ensure that its radiographers and radiographers' assistants follow the [~~Bureau's regulatory requirements~~]Utah Radiation Control Rules and the applicant's operating and emergency procedures. The inspection program must:

(i) include observation of the performance of each radiographer and radiographers' assistant during an actual radiographic operation at intervals not to exceed three months;

(ii) provide that, if a radiographer or a radiographers' assistant has not participated in a radiographic operation for more than three months since the last inspection, that individual's performance must be observed and recorded the next time the individual participates in a radiographic operation; and

(iii) include the retention of inspection records on the performance of radiographers or radiographers' assistants for three years.

(d) The applicant submits to the [~~Bureau~~]Executive Secretary a description of the applicant's overall organizational structure pertaining to the industrial radiography program, including specified delegations of authority and responsibility for operation of the program.

(e) The applicant conducting leak tests has established adequate procedures to be followed in leak testing sealed sources for possible leakage and contamination and submits to the [~~Bureau~~]Executive Secretary a description of such procedures including:

(i) instrumentation to be used;

(ii) method of performing tests, e.g., points on equipment to be smeared and method of taking smear; and

(iii) pertinent experience of the person who will perform the tests.

(f) The licensee shall conduct a program for inspection and maintenance of radiographic exposure devices and storage containers to assure proper functioning of components important to safety.

R313-36-20 Performance Requirements for Radiographic Equipment.

10 CFR 34.20 and 34.21, 1993 ed., which is incorporated by reference with the

following exception: substitute R313-19-100 for the reference to 10 CFR Part 71.

R313-36-21. Equipment Control.

[~~Limits on levels of radiation for radiographic exposure devices and storage containers:~~

~~(1) Radiographic exposure devices measuring less than four inches from the sealed source storage position to any exterior surface of the device shall have no radiation level in excess of 50 milliroentgens (1.29 x 10^{-5} C/kg) per hour at 6 inches (15 cm) from any exterior surface of the device.~~

~~(2) Radiographic exposure devices measuring a minimum of 4 inches (10 cm) from the sealed source storage position to any exterior surface of the device, and all storage containers for sealed sources or outer containers for radiographic exposure devices, shall have no radiation level in excess of 200 milliroentgens (5.16 x 10^{-5} C/kg) per hour at any exterior surface, and 10 milliroentgens (2.58 x 10^{-6} C/kg) per hour at 1 meter from any exterior surface.~~

~~(3) The radiation levels specified are with the sealed source in the shielded (i.e., "off") position.~~]

[~~(4)~~](1) Each radiation survey instrument shall be checked with a radiation source at the beginning of each day of use and at the beginning of each work shift to ensure it is operating properly.

[~~(5)~~](2) Radiographic exposure devices, source changers, or transport containers that contain radioactive material may not be stored in residential locations. This rule does not apply to storage of radioactive material in a vehicle in transit for use at temporary job sites, if the licensee complies with R313-36-23 and if the vehicle does not constitute a permanent storage location.

R313-36-22. Locking of Radiographic Exposure Devices.

(1) Each source of radiation shall be provided with a lock or lockable outer container designed to prevent unauthorized or accidental production of radiation or removal or exposure of a sealed source and shall be locked at all times except when under the direct surveillance of a radiographer or radiographer assistant. In addition, during radiographic operations the sealed source assembly shall be locked in the shielded position each time the source is returned to that position.

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

(3) Radiographic exposure devices, source changers, and storage containers, prior to being moved from one location to another and also prior to being secured at a given location, shall be locked and surveyed to assure that the sealed source is in the shielded position.

R313-36-23. Storage Precautions.

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

R313-36-24. Radiation Survey Instruments.

(1) The licensee or registrant shall maintain sufficient calibrated and operable radiation survey instruments to make physical radiation surveys as required by [~~this chapter~~]R313-36. Instrumentation required by [~~this section~~]R313-36-24 shall have a range such that 2 milliroentgens (5.16 x 10^{-7} C/kg) per hour through 1 roentgen (2.58 x 10^{-4} C/kg) per hour can be measured.

(2) Each radiation survey instrument shall be calibrated:

(a) at energies appropriate for use and at intervals not to exceed three months and after each instrument servicing;

(b) such that accuracy within + 20 percent can be demonstrated; and

(c) at two points located approximately 1/3 and 2/3 of full-scale on each scale for linear scale instruments; at midrange of each decade, and at two points of at least one decade for logarithmic scale instruments; and at appropriate points for digital instruments.

(3) Records shall be maintained of these calibrations for two years after

the calibration date for inspection by [~~the Bureau~~]representatives of the Executive Secretary.

R313-36-25. Leak Testing, Repair, Tagging, Opening, Modification, and Replacement of Sealed Sources.

(1) The replacement of any sealed source fastened to or contained in a radiographic exposure device and leak testing, repair, tagging, opening, or any other modification of any sealed source shall be performed only by persons specifically authorized to do so by the [~~Bureau~~]Executive Secretary, the U.S. Nuclear Regulatory Commission, or an Agreement State.

(2) Each sealed source shall be tested for leakage at intervals not to exceed 6 months. In the absence of a certificate from a transferor that a test has been made within the 6 month period prior to the transfer, the sealed source shall not be put into use until tested and results obtained.

(3) The leak test shall be capable of detecting the presence of 0.005 microcurie (185.0 Bq) of removable contamination on the sealed source. An acceptable leak test for sealed sources in the possession of a radiography licensee would be to test at the nearest accessible point to the sealed source storage position, or other appropriate measuring point, by a procedure to be approved pursuant to R313-36-11(1)(e). Records of leak test results shall be kept in units of microcuries (kBq) and maintained for inspection by [~~the Bureau~~]representatives of the Executive Secretary for two years after the leak test is performed or until the sealed source is transferred or disposed of, whichever comes first.

(4) Any test conducted pursuant to paragraphs (2) and (3) of [~~this section~~]R313-36-25 which reveals the presence of 0.005 microcurie (185.0 Bq) or more of removable radioactive material shall be considered evidence that the sealed source is leaking. The licensee shall immediately withdraw the equipment involved from use and shall cause it to be decontaminated and repaired or to be disposed of, in accordance with [~~rules of the Bureau~~]the Utah Radiation Control Rules. Within 5 days after obtaining results of the test, the licensee shall file a report with the [~~Bureau~~]Executive Secretary describing the involved equipment, the test results, and the corrective action taken.

(5) A sealed source which is not fastened to or contained in a radiographic exposure device shall have permanently attached to it a durable tag at least one inch square bearing the prescribed radiation caution symbol in conventional colors, magenta or purple on a yellow background, and at least the instructions: "Danger-Radioactive Material - Do Not Handle - Notify Civil Authorities if Found."

R313-36-26. Quarterly Inventory.

Each licensee shall conduct a quarterly physical inventory to account for all sealed sources received or possessed. The records of the inventories shall be maintained for three years from the date of inventory for inspection by [~~the Bureau~~]representatives of the Executive Secretary and shall include the quantities and kinds of radioactive material, the location of sealed sources, and the date of the inventory, device model, serial number and sealed source serial number.

R313-36-27. Utilization Logs.

(1) Each licensee or registrant shall maintain current logs, which shall be kept available for inspection by [~~the Bureau~~]representatives of the Executive Secretary for two years from the date of the recorded event at the address specified in the license, showing for each source of radiation the following information:

(a) a description (or make and model number) of each source of radiation or storage container in which the sealed source is located:

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

(c) locations where used and dates of use;

(d) the date each source of radiation is removed from storage and returned to storage.

(2) The requirements of [~~subsection~~]R313-36-27(1) shall not apply in industrial radiography utilizing sources of radiation in enclosed interlocked rooms which are not occupied during radiographic operations, which are equipped

with interlocks such that the source of radiation will not operate unless all openings are securely closed and which is so shielded that every location on the exterior meets conditions [~~for an unrestricted area, as~~]specified in [~~R313-15-105~~]R313-15-301.

(3) A separately identified utilization log is not required if the equivalent information is available in records of the licensee or registrant and available at the address specified in the license or registration.

R313-36-28. Inspection and Maintenance of Radiation Machines, Radiographic Exposure Devices, Storage Containers and Source Changers.

(1) The licensee or registrant shall conduct a program for inspection and maintenance of radiation machines, radiographic exposure devices, storage containers and source changers at intervals, not to exceed three months or prior to first use thereafter to assure proper functioning of components important to safety. Records of these inspections and maintenance shall be kept for three years.

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

(3) If any inspection conducted pursuant to R313-36-28(1) reveals damage to components critical to radiation safety, the device shall be removed from service until repairs have been made.

(4) Any maintenance performed on radiographic exposure devices and accessories shall be in accordance with the manufacturer's specifications.

R313-36-29. Special Requirements for Permanent Radiographic Installation.

Permanent radiographic installations having high radiation area entrance controls of the types described in [~~R313-15-203(1)(e)(ii)~~]R313-15-601(1)(b) and (c) and R313-15-601(2), or where the high radiation area is locked to protect against unauthorized or accidental entry, shall also meet the following special requirements:

(1) Each entrance that is used for personnel access to the high radiation area in a permanent radiographic installation to which [~~this section~~]R313-36-29 applies shall have both visible and audible warning signals to warn of the presence of radiation. The visible signal shall be actuated by radiation whenever the source is exposed. The audible signal shall be actuated when an attempt is made to enter the installation while the source is exposed.

(2) The control device or alarm system shall be tested for proper operation at the beginning of each day of equipment use. If a control device or alarm system is operating improperly, it shall be immediately labeled as defective and repaired before industrial radiographic operations are resumed. Records of these tests shall be maintained for [~~Bureau~~]inspection by representatives of the Executive Secretary for three years from the date of the event.

R313-36-30. Special Requirements for Enclosed Radiography.

(1) Systems for enclosed radiography designed to allow admittance of individuals during x-radiation generation shall:

(a) comply with all applicable requirements of R313-36 and [~~R313-15-105~~]R313-15-301 of these rules; and

(b) be evaluated at intervals not to exceed one year to assure compliance with the applicable requirements as specified in R313-36-30(1)(a). Records of these evaluations shall be maintained for inspection by [~~the Bureau~~]representatives of the Executive Secretary for a period of three years after the evaluation.

(2) Cabinet x-ray systems designed to exclude individuals during x-radiation are exempt from the requirements of R313-36 except that:

(a) Operating personnel must be provided with either a film badge or a thermoluminescent dosimeter and reports of the results must be maintained for inspection by [~~the Bureau~~]representatives of the Executive Secretary.

(b) No registrant shall permit any individual to operate a cabinet x-ray system until such individual has received a copy of and instruction in the operating procedures for the unit and has demonstrated competence in its use. Records which demonstrate compliance with this subparagraph shall be maintained

for inspection by [~~the Bureau~~]representatives of the Executive Secretary until disposition is authorized by the [~~Bureau~~]Executive Secretary.

(c) Tests for proper operation of high radiation area control devices or alarm systems, where applicable, must be conducted at the beginning of each day of use and recorded.

(d) The registrant shall perform an evaluation, at intervals not to exceed one year, to determine compliance with [~~R313-15-105 of these rules~~]R313-15-301. Records of these evaluations shall be maintained for inspection by [~~the Bureau~~]representatives of the Executive Secretary for a period of three years after the evaluation.

R313-36-31. Limitations - Personnel Radiation Safety Requirements for Radiographers and Radiographers' Assistant.

(1) No licensee or registrant shall permit any individual to act as a radiographer as defined in [~~this chapter~~]R313-36 until such individual has complied with all of the following:

(a) been instructed in the subjects outlined in R313-36-100;

(b) received copies of and instruction in the rules contained in [~~this chapter~~]R313-36 and the applicable sections of appropriate license(s), and the licensee's or registrant's operating and emergency procedures, and shall have demonstrated understanding thereof;

(c) demonstrated competence to use the source of radiation, related handling tools, and radiation survey instruments which will be employed in the individual's assignment;

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

(2) No licensee or registrant shall permit any individual to act as a radiographer's assistant as defined in [~~this chapter~~]R313-36 until such individual has complied with all of the following:

(a) received copies of and instruction in the licensee's or registrant's operating and emergency procedures;

(b) demonstrated competence to use under the personal supervision of the radiographer the sources of radiation, related handling tools, and radiation survey instruments which will be employed in the individual's assignment;

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

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

(3) Each licensee or registrant shall maintain, for inspection by [~~the Bureau~~]representatives of the Executive Secretary, records of training and testing which demonstrate that the requirements of R313-36-31(1) and (2) are met.

(4) Each licensee or registrant shall conduct an internal audit program to ensure that the [~~Bureau's~~]radioactive material license conditions and the licensee's or registrant's operating and emergency procedures are followed by each radiographer and radiographer's assistant. These internal audits shall be performed at least quarterly, and each radiographer shall be audited at least [~~annually~~]quarterly. Records of internal audits shall be maintained for inspection by [~~the Bureau~~]representatives of the Executive Secretary for three years from the date of the audit.

R313-36-32. Operating and Emergency Procedures.

The licensee's or registrant's operating and emergency procedures shall include instructions in at least the following:

(1) the handling and use of sources of radiation to be employed such that no individual is likely to be exposed to radiation doses in excess of the limits established in R313-15 "Standards for Protection Against Radiation;"

(2) methods and occasions for conducting radiation surveys;

(3) methods for controlling access to radiographic areas;

(4) methods and occasions for locking and securing sources of radiation;

(5) personnel monitoring and the use of personnel monitoring equipment including steps that must be taken immediately by radiography personnel in the event a pocket dosimeter is found to be off-scale;

(6) transportation to field locations, including packing of sources of radiation in the vehicles, posting of vehicles, and control of sources of radiation during transportation;

(7) minimizing exposure of individuals in the event of an accident;

(8) the procedure for notifying proper personnel in the event of a theft, loss, over exposure or accident involving sources of radiation;

(9) maintenance of records;

(10) the inspection and maintenance of radiographic exposure devices, source changers, storage containers and radiation machines.

R313-36-33. Personnel Monitoring Control.

[~~(1) No licensee or registrant shall permit any individual to act as a radiographer or as a radiographer's assistant unless, at all times during radiographic operations, each such individual shall wear a film or TLD badge and a direct reading pocket dosimeter. Pocket dosimeters shall be capable of measuring doses from zero to at least 200 milliroentgens (5.16×10^{-5} C/kg). A film or TLD badge shall be assigned to and worn by only one individual.~~

~~(2) Pocket dosimeters shall be read and doses recorded daily. Pocket dosimeters shall be charged at the beginning of each working day. Pocket dosimeters shall be checked at periods not to exceed one year for correct response to radiation. Acceptable dosimeters shall read within plus or minus 30 percent of the true radiation exposure.~~

~~(3) A film or TLD badge shall be immediately processed if a pocket dosimeter is discharged beyond its range during normal use and industrial radiographic operations by that individual shall cease. The individual shall not return to work with sources of radiation until a determination of his radiation exposure has been made.~~

~~(4) Reports received from the film badge or TLD processor and records of daily pocket dosimeter readings shall be kept for inspection by the Bureau until the Bureau authorizes their disposition.~~

~~(5) If a film badge or TLD is lost or damaged, the worker shall cease work immediately until a replacement film badge or TLD is provided and the exposure is calculated for the time period from issuance to loss or damage of the film badge or TLD.~~]10 CFR 34.33, 1993 ed., which is incorporated by reference with the following exception: substitute "Executive Secretary" for the reference to "Commission".

R313-36-41. Security-Precautionary Procedures in Radiographic Operations.

(1) During each radiographic operation, the radiographer or radiographer's assistant shall maintain a direct surveillance of the operation to protect against unauthorized entry into a high radiation area, as defined in R313-12, except:

(a) where the high radiation area is equipped with a control device or alarm system as described in [~~R313-15-203(1)(e)(ii)~~]R313-15-601(1)(a), (b) or (c); or

(b) where the high radiation area is locked to protect against unauthorized or accidental entry.

(2) When not in operation or when not under direct surveillance, portable radiation exposure devices shall be physically secured to prevent removal by unauthorized personnel.

R313-36-42. Posting.

Notwithstanding any provisions in paragraph [~~R313-15-204~~]R313-15-903 areas in which radiography is being performed or in which a radiographic exposure device is being stored shall be conspicuously posted and access to the area shall be controlled as required by [~~R313-15-203~~]R313-15-902(1) and (2).

R313-36-43. Radiation Surveys and Survey Records.

(1) At least one calibrated and operable radiation survey instrument as described in R313-36-24 shall be available and used at each site where radiographic exposures are made, and at the storage area, as defined in R313-36-2, whenever a radiographic exposure device, a storage container, or source is being placed in storage.

(2) A physical radiation survey shall be made after each radiographic

exposure utilizing radiographic exposure devices or sealed sources of radioactive material to determine that the sealed source has been returned to its shielded position. The entire circumference of the radiographic exposure device shall be surveyed. If the radiographic exposure device has a source guide tube, the survey shall include the guide tube.

(3) A physical radiation survey shall be made whenever a radiographic exposure device is placed in a storage area, as defined in R313-36-2, to determine that the sealed source is in its shielded position. The entire circumference of the radiographic exposure device must be surveyed.

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

(5) A physical radiation survey shall be made of the boundary of the restricted area during radiographic operations not employing shielded room radiography. The maximum survey reading at the boundary shall be recorded. The records shall indicate approximate distance from source to boundaries, whether or not the exposed source is collimated and any occupied areas with exposure levels greater than 2 milliroentgens (5.16×10^{-7} C/kg) in any hour during radiographic operations.

(6) A record of the storage survey required in paragraph (3) shall be made and retained for three years when that storage survey is the last one performed in the work day. Records required by paragraph (4) shall be maintained for two years after completion of the survey.

R313-36-44. Supervision of Radiographer's Assistant.

Whenever a radiographer's assistant uses radiographic exposure devices, uses sealed sources or related source handling tools, or conducts radiation surveys required by R313-36-43(2), (3), or (4) to determine that the sealed source has returned to the shielded position after an exposure, he shall be under the personal supervision, as defined in R313-36-2(4), by a radiographer. The personal supervision shall include (1) the radiographer's personal presence at the site where the sealed sources are being used; (2) the ability of the radiographer to give immediate assistance if required; and (3) the radiographer to observe the performance of his/her assistant during the operations referred to in [~~this section~~]R313-36-44.

R313-36-45. Records Required at Temporary Job Sites.

Each licensee or registrant conducting industrial radiography at a temporary site shall have the following records available at that site for inspection by [~~the Bureau~~]representatives of the Executive Secretary:

(1) appropriate license;

(2) operating and emergency procedures;

(3) applicable rules;

(4) survey records required pursuant to R313-36-43 for the period of operation at the site;

(5) daily pocket dosimeter records for the period of operation at the site; and

(6) the latest instrument calibration and leak test record for specific devices in use at the site.

R313-36-46. Specific Requirements for Radiographic Personnel Performing Industrial Radiography.

(1) At a job site, the following shall be supplied by the licensee or registrant:

(a) at least one operable, calibrated survey instrument;

(b) a current whole body personnel monitor (TLD or film badge) for each individual;

(c) an operable, calibrated pocket dosimeter with a range of zero to at least 200 milliroentgens (5.16×10^{-5} C/kg) for each worker; and

(d) the appropriate barrier ropes and signs.

(2) Industrial radiographic operations shall not be performed if any of the items in R313-36-46 are not available at the job site or are inoperable.

(3) Each licensee or registrant shall provide as a minimum two person crews when sources of radiation are used at temporary job sites.

(4) No individual other than a radiographer or a radiographer assistant

who is under the personal supervision of a radiographer instructor shall manipulate controls or operate equipment used in industrial radiographic operations.

(5) During an inspection by [~~the Bureau~~]representatives of the Executive Secretary, the [~~Bureau inspector~~]representatives of the Executive Secretary may terminate an operation if any of the items in R313-36-46 are not available and operable or if the required number of radiographic personnel are not present. Operations shall not be resumed until such conditions are met.

(6) No individual shall act as a radiographer instructor unless such individual:

(a) has met the requirements of R313-36-31;

(b) has one year of documented experience as an radiographer; and

(c) has been named as a radiographer instructor on the license issued by the [~~Bureau~~]Executive Secretary.

R313-36-50. Prohibitions.

Industrial radiography performed with a sealed source which is not fastened to or contained in a radiographic exposure device (fishpole technique) is prohibited unless specifically authorized in a license issued by the [~~Bureau~~]Executive Secretary.

R313-36-100. The Training of Radiographers.

The training of radiographers shall include at least the following:

(1) Fundamentals of radiation safety:

(a) characteristics of ionizing radiation;

(b) units of radiation dose and quantity of radioactivity;

(c) hazards of exposure to radiation;

(i) radiation protection standards;

(ii) biological effects of radiation dose;

(d) levels of radiation from sources of radiation;

(e) methods of controlling radiation dose;

(i) working time;

(ii) working distances; and

(iii) shielding.

(2) Radiation detection instrumentation to be used:

(a) use of radiation survey instruments;

(i) operation;

(ii) calibration;

(iii) limitations;

(b) survey techniques;

(c) use of personnel monitoring equipment;

(i) film badges;

(ii) pocket dosimeters; and

(iii) thermoluminescent dosimeters.

(3) Radiographic equipment to be used:

(a) remote handling equipment;

(b) radiographic exposure devices and sealed sources;

(c) storage containers; and

(d) operation and control of x-ray equipment.

(4) The requirements of pertinent federal and state rules.

(5) The licensee's or registrant's written operating and emergency procedures.

(6) Case histories of radiography accidents.

KEY: industry, radioactive material, licensing, surveys
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R313. Environmental Quality, Radiation Control.
R313-15. Standards for Protection Against Radiation.
R313-15-1. Purpose, Authority and Scope.

(1) R313-15 establishes standards for protection against ionizing radiation resulting from activities conducted pursuant to licenses issued by the Executive Secretary. These rules are issued pursuant to UCA 19-3-101 through 19-3-301.

(2) The requirements of R313-15 are designed to control the receipt, possession, use, transfer, and disposal of sources of radiation by any licensee or registrant so the total dose to an individual, including doses resulting from all sources of radiation other than background radiation, does not exceed the standards for protection against radiation prescribed in R313-15. However, nothing in R313-15 shall be construed as limiting actions that may be necessary to protect health and safety.

(3) Except as specifically provided in other sections of these rules, R313-15 applies to persons licensed or registered by the Executive Secretary to receive, possess, use, transfer, or dispose of sources of radiation. The limits in R313-15 do not apply to doses due to background radiation, to exposure of patients to radiation for the purpose of medical diagnosis or therapy, or to voluntary participation in medical research programs.

R313-15-2 Definitions.

"Annual limit on intake" (ALI) means the derived limit for the amount of radioactive material taken into the body of an adult worker by inhalation or ingestion in a year. ALI is the smaller value of intake of a given radionuclide in a year by the reference man that would result in a committed effective dose equivalent of 0.05 Sv (5 rem) or a committed dose equivalent of 0.5 Sv (50 rem) to any individual organ or tissue. ALI values for intake by ingestion and by inhalation of selected radionuclides are given in Table I, Columns 1 and 2, of Appendix B of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference.

"Class" means a classification scheme for inhaled material according to its rate of clearance from the pulmonary region of the lung. Materials are classified as D, W, or Y, which applies to a range of clearance half-times: for Class D, Days, of less than ten days, for Class W, Weeks, from ten to 100 days , and for Class Y, Years, of greater than 100 days. For purposes of these rules, "lung class" and "inhalation class" are equivalent terms.

"Declared pregnant woman" means a woman who has voluntarily informed her employer, in writing, of her pregnancy and the estimated date of conception.

"Derived air concentration" (DAC) means the concentration of a given radionuclide in air which, if breathed by the reference man for a working year of 2,000 hours under conditions of light work, results in an intake of one ALI. For purposes of these rules, the condition of light work is an inhalation rate of 1.2 cubic meters of air per hour for 2,000 hours in a year. DAC values are given in Table I, Column 3, of Appendix B of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference.

"Derived air concentration-hour" (DAC-hour) means the product of the concentration of radioactive material in air, expressed as

a fraction or multiple of the derived air concentration for each radionuclide, and the time of exposure to that radionuclide, in hours. A licensee or registrant may take 2,000 DAC-hours to represent one ALI, equivalent to a committed effective dose equivalent of 0.05 Sv (5 rem).

"Dosimetry processor" means an individual or an organization that processes and evaluates individual monitoring devices in order to determine the radiation dose delivered to the monitoring devices.

"Inhalation class", refer to "Class".

"Labeled package" means a package labeled with a Radioactive White I, Yellow II, or Yellow III label as specified in U.S. Department of Transportation regulations 49 CFR 172.403 and 49 CFR 172.436 through 440, 1992 ed. 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 U.S. Department of Transportation regulations 49 CFR 173.403(m) and (w) and 49 CFR 173.421 through 424, 1992 ed.

"Lung class", refer to "Class".

"Nonstochastic effect" means a health effect, the severity of which varies with the dose and for which a threshold is believed to exist. Radiation-induced cataract formation is an example of a nonstochastic effect. For purposes of these rules, "deterministic effect" is an equivalent term.

"Planned special exposure" means an infrequent exposure to radiation, separate from and in addition to the annual occupational dose limits.

"Quarter" means a period of time equal to one-fourth of the year observed by the licensee, approximately 13 consecutive weeks, providing that the beginning of the first quarter in a year coincides with the starting date of the year and that no day is omitted or duplicated in consecutive quarters.

"Reference Man" means a hypothetical aggregation of human physical and physiological characteristics determined by international consensus. These characteristics may be used by researchers and public health workers to standardize results of experiments and to relate biological insult to a common base. A description of the Reference Man is contained in the International Commission on Radiological Protection report, ICRP Publication 23, "Report of the Task Group on Reference Man."

"Respiratory protective equipment" means an apparatus, such as a respirator, used to reduce an individual's intake of airborne radioactive materials.

"Sanitary sewerage" means a system of public sewers for carrying off waste water and refuse, but excluding sewage treatment facilities, septic tanks, and leach fields owned or operated by the licensee or registrant.

"Stochastic effect" means a health effect that occurs randomly and for which the probability of the effect occurring, rather than its severity, is assumed to be a linear function of dose without threshold. Hereditary effects and cancer incidence are examples of stochastic effects. For purposes of these rules, "probabilistic effect" is an equivalent term.

"Very high radiation area" means an area, accessible to individuals, in which radiation levels could result in an individual receiving an absorbed dose in excess of five Gy (500 rad) in one hour at meter from a source of radiation or from any surface that the radiation penetrates. At very high doses received at high dose rates, units of absorbed dose, gray and rad, are appropriate, rather than units of dose equivalent, sievert and rem.

"Weighting factor" w_T for an organ or tissue (T) means the proportion of the risk of stochastic effects resulting from irradiation of that organ or tissue to the total risk of stochastic effects when the whole body is irradiated uniformly. For calculating the effective dose equivalent, the values of w_T are:

ORGAN DOSE WEIGHTING FACTORS

Organ or Tissue	w_T
Gonads	0.25
Breast	0.15
Red bone marrow	0.12
Lung	0.12
Thyroid	0.03
Bone surfaces	0.03
Remainder	0.30(1)
Whole Body	1.00(2)

(1) 0.30 results from 0.06 for each of five "remainder" organs, excluding the skin and the lens of the eye, that receive the highest doses.

(2) For the purpose of weighting the external whole body dose, for adding it to the internal dose, a single weighting factor, $w_T = 1.0$, has been specified. The use of other weighting factors for external exposure will be approved on a case-by-case basis until such time as specific guidance is issued.

R313-15-3. Implementation.

(1) Any existing license or registration condition that is more restrictive than R313-15 remains in force until there is an amendment or renewal of the license or registration.

(2) If a license or registration condition exempts a licensee or registrant from a provision of R313-15 in effect on or before January 1, 1994, it also exempts the licensee or registrant from the corresponding provision of R313-15.

(3) If a license or registration condition cites provisions of R313-15 in effect prior to January 1, 1994, which do not correspond to any provisions of R313-15, the license or registration condition remains in force until there is an amendment or renewal of the license or registration that modifies or removes this condition.

R313-15-101. Radiation Protection Programs.

(1) Each licensee or registrant shall develop, document, and implement a radiation protection program sufficient to ensure compliance with the provisions of R313-15. See R313-15-1102 for recordkeeping requirements relating to these programs.

(2) 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).

(3) The licensee or registrant shall, at intervals not to exceed 12 months, review the radiation protection program content and implementation.

R313-15-201. Occupational Dose Limits for Adults.

(1) The licensee or registrant shall control the occupational dose to individual adults, except for planned special exposures pursuant to R313-15-206, to the following dose limits:

(a) An annual limit, which is the more limiting of:

(i) The total effective dose equivalent being equal to 0.05 Sv (5 rem); or

(ii) The sum of the deep dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye being equal to 0.50 Sv (50 rem).

(b) The annual limits to the lens of the eye, to the skin, and to the extremities which are:

(i) An eye dose equivalent of 0.15 Sv (15 rem), and

(ii) A shallow dose equivalent of 0.50 Sv (50 rem) to the skin or to any extremity.

(2) Doses received in excess of the annual limits, including doses received during accidents, emergencies, and planned special exposures, shall be subtracted from the limits for planned special exposures that the individual may receive during the current year and during the individual's lifetime. See R313-15-206(5)(a) and (b).

(3) The assigned deep dose equivalent and shallow dose equivalent shall be for the portion of the body receiving the highest exposure determined as follows:

(a) The deep dose equivalent, eye dose equivalent and shallow dose equivalent may be assessed from surveys or other radiation measurements for the purpose of demonstrating compliance with the occupational dose limits, if the individual monitoring device was not in the region of highest potential exposure, or the results of individual monitoring are unavailable; or

(b) When a protective apron is worn and monitoring is conducted as specified in R313-15-502(1)(d), the effective dose equivalent for external radiation shall be determined as follows:

(i) When only one individual monitoring device is used and it is located at the neck outside the protective apron, and the reported dose exceeds 25 percent of the limit specified in R313-15-201(1), the reported deep dose equivalent value multiplied by 0.3 shall be the effective dose equivalent for external radiation; or

(ii) When individual monitoring devices are worn, both under the protective apron at the waist and outside the protective apron at the neck, the effective dose equivalent for external radiation shall be assigned the value of the sum of the deep dose equivalent reported for the individual monitoring device located at the waist under the protective apron multiplied by 1.5 and the deep dose equivalent reported for the individual monitoring device located at the neck outside the protective apron multiplied by 0.04.

(4) Derived air concentration (DAC) and annual limit on

intake (ALI) values are presented in Table I of Appendix B of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference, and may be used to determine the individual's dose and to demonstrate compliance with the occupational dose limits. See R313-15-1107.

(5) Notwithstanding the annual dose limits, the licensee shall limit the soluble uranium intake by an individual to ten milligrams in a week in consideration of chemical toxicity. See footnote 3, of Appendix B of 10 CFR 20.1001 to 20-2402, 1993 ed., which is incorporated by reference.

(6) The licensee or registrant shall reduce the dose that an individual may be allowed to receive in the current year by the amount of occupational dose received while employed by any other person. See R313-15-205(5).

R313-15-202. Compliance with Requirements for Summation of External and Internal Doses.

(1) If the licensee or registrant is required to monitor pursuant to both R313-15-502(1) and (2), the licensee or registrant shall demonstrate compliance with the dose limits by summing external and internal doses. If the licensee or registrant is required to monitor only pursuant to R313-15-502(1) or only pursuant to R313-15-502(2), then summation is not required to demonstrate compliance with the dose limits. The licensee or registrant may demonstrate compliance with the requirements for summation of external and internal doses pursuant to R313-15-202(2),(3) and (4). The dose equivalents for the lens of the eye, the skin, and the extremities are not included in the summation, but are subject to separate limits.

(2) Intake by Inhalation. If the only intake of radionuclides is by inhalation, the total effective dose equivalent limit is not exceeded if the sum of the deep dose equivalent divided by the total effective dose equivalent limit, and one of the following, does not exceed unity:

(a) The sum of the fractions of the inhalation ALI for each radionuclide, or

(b) The total number of derived air concentration-hours (DAC-hours) for all radionuclides divided by 2,000, or

(c) The sum of the calculated committed effective dose equivalents to all significantly irradiated organs or tissues (T) calculated from bioassay data using appropriate biological models and expressed as a fraction of the annual limit. For purposes of this requirement, an organ or tissue is deemed to be significantly irradiated if, for that organ or tissue, the product of the weighting factors, w_T, and the committed dose equivalent, $H_{T,50}$, per unit intake is greater than ten percent of the maximum weighted value of H_{50}, that is, $w_T H_{T,50}$, per unit intake for any organ or tissue.

(3) Intake by Oral Ingestion. If the occupationally exposed individual also receives an intake of radionuclides by oral ingestion greater than ten percent of the applicable oral ALI, the licensee or registrant shall account for this intake and include it in demonstrating compliance with the limits.

(4) Intake through Wounds or Absorption through Skin. The

licensee or registrant shall evaluate and, to the extent practical, account for intakes through wounds or skin absorption. The intake through intact skin has been included in the calculation of DAC for hydrogen-3 and does not need to be evaluated or accounted for pursuant to R313-15-202(4).

R313-15-203. Determination of External Dose from Airborne Radioactive Material.

(1) Licensees or registrants shall, when determining the dose from airborne radioactive material, include the contribution to the deep dose equivalent, eye dose equivalent, and shallow dose equivalent from external exposure to the radioactive cloud. See footnotes 1 and 2 of Appendix B of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference.

(2) Airborne radioactivity measurements and DAC values shall not be used as the primary means to assess the deep dose equivalent when the airborne radioactive material includes radionuclides other than noble gases or if the cloud of airborne radioactive material is not relatively uniform. The determination of the deep dose equivalent to an individual shall be based upon measurements using instruments or individual monitoring devices.

R313-15-204. Determination of Internal Exposure.

(1) For purposes of assessing dose used to determine compliance with occupational dose equivalent limits, the licensee or registrant shall, when required pursuant to R313-15-502, take suitable and timely measurements of:

(a) Concentrations of radioactive materials in air in work areas; or

(b) Quantities of radionuclides in the body; or

(c) Quantities of radionuclides excreted from the body; or

(d) Combinations of these measurements.

(2) Unless respiratory protective equipment is used, as provided in R313-15-703, or the assessment of intake is based on bioassays, the licensee or registrant shall assume that an individual inhales radioactive material at the airborne concentration in which the individual is present.

(3) When specific information on the physical and biochemical properties of the radionuclides taken into the body or the behavior of the material in an individual is known, the licensee or registrant may:

(a) Use that information to calculate the committed effective dose equivalent, and, if used, the licensee or registrant shall document that information in the individual's record; and

(b) Upon prior approval of the Executive Secretary, adjust the DAC or ALI values to reflect the actual physical and chemical characteristics of airborne radioactive material, for example, aerosol size distribution or density; and

(c) Separately assess the contribution of fractional intakes of Class D, W, or Y compounds of a given radionuclide to the committed effective dose equivalent. See Appendix B of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference.

(4) If the licensee or registrant chooses to assess intakes of Class Y material using the measurements given in R313-15-

204(1)(b) or (c), the licensee or registrant may delay the recording and reporting of the assessments for periods up to seven months, unless otherwise required by R313-15-1202 or R313-15-1203. This delay permits the licensee or registrant to make additional measurements basic to the assessments.

(5) If the identity and concentration of each radionuclide in a mixture are known, the fraction of the DAC applicable to the mixture for use in calculating DAC-hours shall be either:

(a) The sum of the ratios of the concentration to the appropriate DAC value, that is, D, W, or Y, from Appendix B of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference, for each radionuclide in the mixture; or

(b) The ratio of the total concentration for all radionuclides in the mixture to the most restrictive DAC value for any radionuclide in the mixture.

(6) If the identity of each radionuclide in a mixture is known, but the concentration of one or more of the radionuclides in the mixture is not known, the DAC for the mixture shall be the most restrictive DAC of any radionuclide in the mixture.

(7) When a mixture of radionuclides in air exists, a licensee or registrant may disregard certain radionuclides in the mixture if:

(a) The licensee or registrant uses the total activity of the mixture in demonstrating compliance with the dose limits in R313-15-201 and in complying with the monitoring requirements in R313-15-502(2), and

(b) The concentration of any radionuclide disregarded is less than ten percent of its DAC, and

(c) The sum of these percentages for all of the radionuclides disregarded in the mixture does not exceed 30 percent.

(8) When determining the committed effective dose equivalent, the following information may be considered:

(a) In order to calculate the committed effective dose equivalent, the licensee or registrant may assume that the inhalation of one ALI, or an exposure of 2,000 DAC-hours, results in a committed effective dose equivalent of 0.05 Sv (5 rem) for radionuclides that have their ALIs or DACs based on the committed effective dose equivalent.

(b) For an ALI and the associated DAC determined by the nonstochastic organ dose limit of 0.50 Sv (50 rem), the intake of radionuclides that would result in a committed effective dose equivalent of 0.05 Sv (5 rem), that is, the stochastic ALI, is listed in parentheses in Table I of Appendix B of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference. The licensee or registrant may, as a simplifying assumption, use the stochastic ALI to determine committed effective dose equivalent. However, if the licensee or registrant uses the stochastic ALI, the licensee or registrant shall also demonstrate that the limit in R313-15-201(1)(a)(ii) is met.

R313-15-205. Determination of Prior Occupational Dose.

(1) For each individual who may enter the licensee's or registrant's restricted or controlled area and is likely to receive, in a year, an occupational dose requiring monitoring

pursuant to R313-15-502, the licensee or registrant shall:

(a) Determine the occupational radiation dose received during the current year; and

(b) Attempt to obtain the records of lifetime cumulative occupational radiation dose.

(2) Prior to permitting an individual to participate in a planned special exposure, the licensee or registrant shall determine:

(a) The internal and external doses from all previous planned special exposures; and

(b) All doses in excess of the limits, including doses received during accidents and emergencies, received during the lifetime of the individual; and

(c) All lifetime cumulative occupational radiation dose.

(3) In complying with the requirements of R313-15-205(1), a licensee or registrant may:

(a) Accept, as a record of the occupational dose that the individual received during the current year, a written signed statement from the individual, or from the individual's most recent employer for work involving radiation exposure, that discloses the nature and the amount of any occupational dose that the individual received during the current year; and

(b) Accept, as the record of lifetime cumulative radiation dose, an up-to-date form DRC-05 or equivalent, signed by the individual and countersigned by an appropriate official of the most recent employer for work involving radiation exposure, or the individual's current employer, if the individual is not employed by the licensee or registrant; and

(c) Obtain reports of the individual's dose equivalent from the most recent employer for work involving radiation exposure, or the individual's current employer, if the individual is not employed by the licensee or registrant, by telephone, telegram, facsimile, or letter. The licensee or registrant shall request a written verification of the dose data if the authenticity of the transmitted report cannot be established.

(4)(a) The licensee or registrant shall record the exposure history, as required by R313-15-205(1), on form DRC-05, or other clear and legible record, of all the information required on that form. The form or record shall show each period in which the individual received occupational exposure to radiation or radioactive material and shall be signed by the individual who received the exposure. For each period for which the licensee or registrant obtains reports, the licensee or registrant shall use the dose shown in the report in preparing form DRC-05 or equivalent. For any period in which the licensee or registrant does not obtain a report, the licensee or registrant shall place a notation on form DRC-05 or equivalent indicating the periods of time for which data are not available.

(b) Licensees or registrants are not required to reevaluate the separate external dose equivalents and internal committed dose equivalents or intakes of radionuclides assessed pursuant to the rules in R313-15 in effect before January 1, 1994. Further, occupational exposure histories obtained and recorded on form DRC-05 or equivalent before January 1, 1994, would not have included

effective dose equivalent, but may be used in the absence of specific information on the intake of radionuclides by the individual.

(5) If the licensee or registrant is unable to obtain a complete record of an individual's current and previously accumulated occupational dose, the licensee or registrant shall assume:

(a) In establishing administrative controls under R313-15-201(6) for the current year, that the allowable dose limit for the individual is reduced by 12.5 mSv (1.25 rem) for each quarter for which records were unavailable and the individual was engaged in activities that could have resulted in occupational radiation exposure; and

(b) That the individual is not available for planned special exposures.

(6) The licensee or registrant shall retain the records on form DRC-05 or equivalent until the Executive Secretary terminates each pertinent license or registration requiring this record. The licensee or registrant shall retain records used in preparing form DRC-05 or equivalent for three years after the record is made.

R313-15-206. Planned Special Exposures.

A licensee or registrant may authorize an adult worker to receive doses in addition to and accounted for separately from the doses received under the limits specified in R313-15-201 provided that each of the following conditions is satisfied:

(1) The licensee or registrant authorizes a planned special exposure only in an exceptional situation when alternatives that might avoid the higher exposure are unavailable or impractical.

(2) The licensee or registrant, and employer if the employer is not the licensee or registrant, specifically authorizes the planned special exposure, in writing, before the exposure occurs.

(3) Before a planned special exposure, the licensee or registrant ensures that each individual involved is:

(a) Informed of the purpose of the planned operation; and

(b) Informed of the estimated doses and associated potential risks and specific radiation levels or other conditions that might be involved in performing the task; and

(c) Instructed in the measures to be taken to keep the dose ALARA considering other risks that may be present.

(4) Prior to permitting an individual to participate in a planned special exposure, the licensee or registrant ascertains prior doses as required by R313-15-205(2) during the lifetime of the individual for each individual involved.

(5) Subject to R313-15-201(2), the licensee or registrant shall not authorize a planned special exposure that would cause an individual to receive a dose from all planned special exposures and all doses in excess of the limits to exceed:

(a) The numerical values of any of the dose limits in R313-15-201(1) in any year; and

(b) Five times the annual dose limits in R313-15-201(1) during the individual's lifetime.

(6) The licensee or registrant maintains records of the conduct of a planned special exposure in accordance with R313-15-

1106 and submits a written report in accordance with R313-15-1204.

(7) The licensee or registrant records the best estimate of the dose resulting from the planned special exposure in the individual's record and informs the individual, in writing, of the dose within 30 days from the date of the planned special exposure. The dose from planned special exposures shall not be considered in controlling future occupational dose of the individual pursuant to R313-15-201(1) but shall be included in evaluations required by R313-15-206(4) and (5).

R313-15-207. Occupational Dose Limits for Minors.

The annual occupational dose limits for minors are ten percent of the annual occupational dose limits specified for adult workers in R313-15-201.

R313-15-208. Dose to an Embryo/Fetus.

(1) The licensee or registrant shall ensure that the dose to an embryo/fetus during the entire pregnancy, due to occupational exposure of a declared pregnant woman, does not exceed five mSv (0.5 rem). See R313-15-1107 for recordkeeping requirements.

(2) The licensee or registrant shall make efforts to avoid substantial variation above a uniform monthly exposure rate to a declared pregnant woman so as to satisfy the limit in R313-15-208(1).

(3) The dose to an embryo/fetus shall be taken as the sum of:

(a) The deep dose equivalent to the declared pregnant woman; and

(b) The dose to the embryo/fetus from radionuclides in the embryo/fetus and radionuclides in the declared pregnant woman.

(4) If by the time the woman declares pregnancy to the licensee or registrant, the dose to the embryo/fetus has exceeded 4.5 mSv (0.45 rem) the licensee or registrant shall be deemed to be in compliance with R313-15-208(1) if the additional dose to the embryo/fetus does not exceed 0.50 mSv (0.05 rem) during the remainder of the pregnancy.

R313-15-301. Dose Limits for Individual Members of the Public.

(1) Each licensee or registrant shall conduct operations so that:

(a) The total effective dose equivalent to individual members of the public from the licensed or registered operation does not exceed one mSv (0.1 rem) in a year, exclusive of the dose contribution from the licensee's or registrant's disposal of radioactive material into sanitary sewerage in accordance with R313-15-1003, and

(b) The dose in any unrestricted area from external sources does not exceed 0.02 mSv (0.002 rem) in any one hour.

(2) If the licensee or registrant permits members of the public to have access to controlled areas, the limits for members of the public continue to apply to those individuals.

(3) A licensee, registrant, or an applicant for a license or registration may apply for prior Executive Secretary authorization to operate up to an annual dose limit for an individual member of

the public of five mSv (0.5 rem). This application shall include the following information:

(a) Demonstration of the need for and the expected duration of operations in excess of the limit in R313-15-301(1); and

(b) The licensee's or registrant's program to assess and control dose within the five mSv (0.5 rem) annual limit; and

(c) The procedures to be followed to maintain the dose ALARA.

(4) The Executive Secretary may impose additional restrictions on radiation levels in unrestricted areas and on the total quantity of radionuclides that a licensee or registrant may release in effluents in order to restrict the collective dose.

R313-15-302. Compliance with Dose Limits for Individual Members of the Public.

(1) The licensee or registrant shall make or cause to be made surveys of radiation levels in unrestricted and controlled areas and radioactive materials in effluents released to unrestricted and controlled areas to demonstrate compliance with the dose limits for individual members of the public in R313-15-301.

(2) A licensee or registrant shall show compliance with the annual dose limit in R313-15-301 by:

(a) Demonstrating by measurement or calculation that the total effective dose equivalent to the individual likely to receive the highest dose from the licensed or registered operation does not exceed the annual dose limit; or

(b) Demonstrating that:

(i) The annual average concentrations of radioactive material released in gaseous and liquid effluents at the boundary of the unrestricted area do not exceed the values specified in Table II of Appendix B of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference; and

(ii) If an individual were continually present in an unrestricted area, the dose from external sources would not exceed 0.02 mSv (0.002 rem) in an hour and 0.50 mSv (0.05 rem) in a year.

(3) Upon approval from the Executive Secretary, the licensee or registrant may adjust the effluent concentration values in Appendix B, Table II of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference, for members of the public, to take into account the actual physical and chemical characteristics of the effluents, such as, aerosol size distribution, solubility, density, radioactive decay equilibrium, and chemical form.

R313-15-401. Testing for Leakage or Contamination of Sealed Sources.

(1) The licensee or registrant in possession of any sealed source shall assure that:

(a) Each sealed source, except as specified in R313-15-401(2), is tested for leakage or contamination and the test results are received before the sealed source is put into use unless the licensee or registrant has a certificate from the transferor indicating that the sealed source was tested within six months before transfer to the licensee or registrant.

(b) Each sealed source that is not designed to emit alpha particles is tested for leakage or contamination at intervals not

to exceed six months or at alternative intervals approved by the Executive Secretary, an Agreement State, a Licensing State, or the U.S. Nuclear Regulatory Commission.

(c) Each sealed source that is designed to emit alpha particles is tested for leakage or contamination at intervals not to exceed three months or at alternative intervals approved by the Executive Secretary, an Agreement State, a Licensing State, or the Nuclear Regulatory Commission.

(d) For each sealed source that is required to be tested for leakage or contamination, at any other time there is reason to suspect that the sealed source might have been damaged or might be leaking, the licensee or registrant shall assure that the sealed source is tested for leakage or contamination before further use.

(e) Tests for leakage for all sealed sources, except brachytherapy sources manufactured to contain radium, shall be capable of detecting the presence of 185 Bq (0.005 uCi) of radioactive material on a test sample. Test samples shall be taken from the sealed source or from the surfaces of the container in which the sealed source is stored or mounted on which one might expect contamination to accumulate. For a sealed source contained in a device, test samples are obtained when the source is in the "off" position.

(f) The test for leakage for brachytherapy sources manufactured to contain radium shall be capable of detecting an absolute leakage rate of 37 Bq (0.001 uCi) of radon-222 in a 24 hour period when the collection efficiency for radon-222 and its daughters has been determined with respect to collection method, volume and time.

(g) Tests for contamination from radium daughters shall be taken on the interior surface of brachytherapy source storage containers and shall be capable of detecting the presence of 185 Bq (0.005 uCi) of a radium daughter which has a half-life greater than four days.

(2) A licensee or registrant need not perform tests for leakage or contamination on the following sealed sources:

(a) Sealed sources containing only radioactive material with a half-life of less than 30 days;

(b) Sealed sources containing only radioactive material as a gas;

(c) Sealed sources containing 3.7 MBq (100 uCi) or less of beta or photon-emitting material or 370 kBq (ten uCi) or less of alpha-emitting material;

(d) Sealed sources containing only hydrogen-3;

(e) Seeds of iridium-192 encased in nylon ribbon; and

(f) Sealed sources, except teletherapy and brachytherapy sources, which are stored, not being used and identified as in storage. The licensee or registrant shall, however, test each such sealed source for leakage or contamination and receive the test results before any use or transfer unless it has been tested for leakage or contamination within six months before the date of use or transfer.

(3) Tests for leakage or contamination from sealed sources shall be performed by persons specifically authorized by the Executive Secretary, an Agreement State, a Licensing State, or the

U.S. Nuclear Regulatory Commission to perform such services.

(4) Test results shall be kept in units of becquerel or microcurie and maintained for inspection by representatives of the Executive Secretary.

(5) The following shall be considered evidence that a sealed source is leaking:

(a) The presence of 185 Bq (0.005 uCi) or more of removable contamination on any test sample.

(b) Leakage of 37 Bq (0.001 uCi) of radon-222 per 24 hours for brachytherapy sources manufactured to contain radium.

(c) The presence of removable contamination resulting from the decay of 185 Bq (0.005 uCi) or more of radium.

(6) The licensee or registrant shall immediately withdraw a leaking sealed source from use and shall take action to prevent the spread of contamination. The leaking sealed source shall be repaired or disposed of in accordance with R313-15.

(7) Reports of test results for leaking or contaminated sealed sources shall be made pursuant to R313-15-1208.

R313-15-501. Surveys and Monitoring - General.

(1) Each licensee or registrant shall make, or cause to be made, surveys that:

(a) Are necessary for the licensee or registrant to comply with R313-15; and

(b) Are necessary under the circumstances to evaluate:

(i) Radiation levels; and

(ii) Concentrations or quantities of radioactive material; and

(iii) The potential radiological hazards that could be present.

(2) The licensee or registrant shall ensure that instruments and equipment used for quantitative radiation measurements, for example, dose rate and effluent monitoring, are calibrated at intervals not to exceed 12 months for the radiation measured.

(3) All personnel dosimeters, except for direct and indirect reading pocket ionization chambers and those dosimeters used to measure the dose to any extremity, that require processing to determine the radiation dose and that are used by licensees and registrants to comply with R313-15-201, with other applicable provisions of these rules, or with conditions specified in a license or registration shall be processed and evaluated by a dosimetry processor:

(a) Holding current personnel dosimetry accreditation from the National Voluntary Laboratory Accreditation Program (NVLAP) of the National Institute of Standards and Technology; and

(b) Approved in this accreditation process for the type of radiation or radiations included in the NVLAP program that most closely approximates the type of radiation or radiations for which the individual wearing the dosimeter is monitored.

(4) The licensee or registrant shall ensure that adequate precautions are taken to prevent a deceptive exposure of an individual monitoring device.

R313-15-502. Conditions Requiring Individual Monitoring of

External and Internal Occupational Dose.

Each licensee or registrant shall monitor exposures from sources of radiation at levels sufficient to demonstrate compliance with the occupational dose limits of R313-15. As a minimum:

(1) Each licensee or registrant shall monitor occupational exposure to radiation and shall supply and require the use of individual monitoring devices by:

(a) Adults likely to receive, in one year from sources external to the body, a dose in excess of ten percent of the limits in R313-15-201(1); and

(b) Minors and declared pregnant women likely to receive, in one year from sources external to the body, a dose in excess of ten percent of any of the applicable limits in R313-15-207 or R313-15-208; and

(c) Individuals entering a high or very high radiation area; and

(d) Individuals working with medical fluoroscopic equipment.

(i) An individual monitoring device used for the dose to an embryo/fetus of a declared pregnant woman, pursuant to R313-15-208(1), shall be located under the protective apron at the waist.

(A) If an individual monitoring device worn by a declared pregnant woman has a monthly reported dose equivalent value in excess of 0.5 mSv (50 mrem), the value to be used for determining the dose to the embryo/fetus, pursuant to R313-15-208(3)(a) for radiation from medical fluoroscopy, may be the value reported by the individual monitoring device worn at the waist underneath the protective apron which has been corrected for the potential overestimation of dose recorded by the monitoring device because of the overlying tissue of the pregnant individual. This correction shall be performed by a radiation safety officer of an institutional radiation safety committee, a qualified expert approved by the Board, or a representative of the Executive Secretary.

(ii) An individual monitoring device used for eye dose equivalent shall be located at the neck, or an unshielded location closer to the eye, outside the protective apron.

(iii) When only one individual monitoring device is used to determine the effective dose equivalent for external radiation pursuant to R313-15-201(3)(b), it shall be located at the neck outside the protective apron. When a second individual monitoring device is used, for the same purpose, it shall be located under the protective apron at the waist. Note: The second individual monitoring device is required for a declared pregnant woman.

(2) Each licensee or registrant shall monitor, to determine compliance with R313-15-204, the occupational intake of radioactive material by and assess the committed effective dose equivalent to:

(a) Adults likely to receive, in one year, an intake in excess of ten percent of the applicable ALI in Table I, Columns 1 and 2, of Appendix B of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference; and

(b) Minors and declared pregnant women likely to receive, in one year, a committed effective dose equivalent in excess of 0.50 mSv (0.05 rem).

R313-15-601. Control of Access to High Radiation Areas.

(1) The licensee or registrant shall ensure that each entrance or access point to a high radiation area has one or more of the following features:

(a) A control device that, upon entry into the area, causes the level of radiation to be reduced below that level at which an individual might receive a deep dose equivalent of one mSv (0.1 rem) in one hour at 30 centimeters from the source of radiation from any surface that the radiation penetrates; or

(b) A control device that energizes a conspicuous visible or audible alarm signal so that the individual entering the high radiation area and the supervisor of the activity are made aware of the entry; or

(c) Entryways that are locked, except during periods when access to the areas is required, with positive control over each individual entry.

(2) In place of the controls required by R313-15-601(1) for a high radiation area, the licensee or registrant may substitute continuous direct or electronic surveillance that is capable of preventing unauthorized entry.

(3) The licensee or registrant may apply to the Executive Secretary for approval of alternative methods for controlling access to high radiation areas.

(4) The licensee or registrant shall establish the controls required by R313-15-601(1) and (3) in a way that does not prevent individuals from leaving a high radiation area.

(5) The licensee or registrant is not required to control each entrance or access point to a room or other area that is a high radiation area solely because of the presence of radioactive materials prepared for transport and packaged and labeled in accordance with the rules of the U.S. Department of Transportation provided that:

(a) The packages do not remain in the area longer than three days; and

(b) The dose rate at one meter from the external surface of any package does not exceed 0.1 mSv (0.01 rem) per hour.

(6) The licensee or registrant is not required to control entrance or access to rooms or other areas in hospitals solely because of the presence of patients containing radioactive material, provided that there are personnel in attendance who are taking the necessary precautions to prevent the exposure of individuals to radiation or radioactive material in excess of the established limits in R313-15 and to operate within the ALARA provisions of the licensee's or registrant's radiation protection program.

(7) The registrant is not required to control entrance or access to rooms or other areas containing sources of radiation capable of producing a high radiation area as described in R313-15-601 if the registrant has met all the specific requirements for access and control specified in other applicable sections of these rules, such as, R313-36 for industrial radiography, R313-28 for x rays in the healing arts, and R313-44 for particle accelerators.

R313-15-602. Control of Access to Very High Radiation Areas.

(1) In addition to the requirements in R313-15-601, the licensee or registrant shall institute measures to ensure that an individual is not able to gain unauthorized or inadvertent access to areas in which radiation levels could be encountered at five Gy (500 rad) or more in one hour at one meter from a source of radiation or any surface through which the radiation penetrates. This requirement does not apply to rooms or areas in which diagnostic x-ray systems are the only source of radiation, or to non-self-shielded irradiators.

(2) The registrant is not required to control entrance or access to rooms or other areas containing sources of radiation capable of producing a very high radiation area as described in R313-15-602(1) if the registrant has met all the specific requirements for access and control specified in other applicable sections of these rules, such as, R313-36 for industrial radiography, R313-28 for x rays in the healing arts, and R313-44 for particle accelerators.

R313-15-603. Control of Access to Very High Radiation Areas -- Irradiators.

(1) Section R313-15-603 applies to licensees or registrants with sources of radiation in non-self-shielded irradiators. Section R313-15-603 does not apply to sources of radiation that are used in teletherapy, in industrial radiography, or in completely self-shielded irradiators in which the source of radiation is both stored and operated within the same shielding radiation barrier and, in the designed configuration of the irradiator, is always physically inaccessible to any individual and cannot create a high levels of radiation in an area that is accessible to any individual.

(2) Each area in which there may exist radiation levels in excess of five Gy (500 rad) in one hour at one meter from a source of radiation that is used to irradiate materials shall meet the following requirements:

(a) Each entrance or access point shall be equipped with entry control devices which:

(i) Function automatically to prevent any individual from inadvertently entering a very high radiation area; and

(ii) Permit deliberate entry into the area only after a control device is actuated that causes the radiation level within the area, from the source of radiation, to be reduced below that at which it would be possible for an individual to receive a deep dose equivalent in excess of one mSv (0.1 rem) in one hour; and

(iii) Prevent operation of the source of radiation if it would produce radiation levels in the area that could result in a deep dose equivalent to an individual in excess of one mSv (0.1 rem) in one hour.

(b) Additional control devices shall be provided so that, upon failure of the entry control devices to function as required by R313-15-603(2)(a):

(i) The radiation level within the area, from the source of radiation, is reduced below that at which it would be possible for an individual to receive a deep dose equivalent in excess of one mSv (0.1 rem) in one hour; and

(ii) Conspicuous visible and audible alarm signals are generated to make an individual attempting to enter the area aware of the hazard and at least one other authorized individual, who is physically present, familiar with the activity, and prepared to render or summon assistance, aware of the failure of the entry control devices.

(c) The licensee or registrant shall provide control devices so that, upon failure or removal of physical radiation barriers other than the sealed source's shielded storage container:

(i) The radiation level from the source of radiation is reduced below that at which it would be possible for an individual to receive a deep dose equivalent in excess of one mSv (0.1 rem) in one hour; and

(ii) Conspicuous visible and audible alarm signals are generated to make potentially affected individuals aware of the hazard and the licensee or registrant or at least one other individual, who is familiar with the activity and prepared to render or summon assistance, aware of the failure or removal of the physical barrier.

(d) When the shield for stored sealed sources is a liquid, the licensee or registrant shall provide means to monitor the integrity of the shield and to signal, automatically, loss of adequate shielding.

(e) Physical radiation barriers that comprise permanent structural components, such as walls, that have no credible probability of failure or removal in ordinary circumstances need not meet the requirements of R313-15-603(2)(c) and (d).

(f) Each area shall be equipped with devices that will automatically generate conspicuous visible and audible alarm signals to alert personnel in the area before the source of radiation can be put into operation and in time for any individual in the area to operate a clearly identified control device, which shall be installed in the area and which can prevent the source of radiation from being put into operation.

(g) Each area shall be controlled by use of such administrative procedures and such devices as are necessary to ensure that the area is cleared of personnel prior to each use of the source of radiation.

(h) Each area shall be checked by a radiation measurement to ensure that, prior to the first individual's entry into the area after any use of the source of radiation, the radiation level from the source of radiation in the area is below that at which it would be possible for an individual to receive a deep dose equivalent in excess of one mSv (0.1 rem) in one hour.

(i) The entry control devices required in R313-15-603(2)(a) shall be tested for proper functioning. See R313-15-1110 for recordkeeping requirements.

(i) Testing shall be conducted prior to initial operation with the source of radiation on any day, unless operations were continued uninterrupted from the previous day; and

(ii) Testing shall be conducted prior to resumption of operation of the source of radiation after any unintentional interruption; and

(iii) The licensee or registrant shall submit and adhere to

a schedule for periodic tests of the entry control and warning systems.

(j) The licensee or registrant shall not conduct operations, other than those necessary to place the source of radiation in safe condition or to effect repairs on controls, unless control devices are functioning properly.

(k) Entry and exit portals that are used in transporting materials to and from the irradiation area, and that are not intended for use by individuals, shall be controlled by such devices and administrative procedures as are necessary to physically protect and warn against inadvertent entry by any individual through these portals. Exit portals for irradiated materials shall be equipped to detect and signal the presence of any loose radioactive material that is carried toward such an exit and automatically to prevent loose radioactive material from being carried out of the area.

(3) Licensees, registrants, or applicants for licenses or registrations for sources of radiation within the purview of R313-15-603(2) which will be used in a variety of positions or in locations, such as open fields or forests, that make it impracticable to comply with certain requirements of R313-15-603(2), such as those for the automatic control of radiation levels, may apply to the Executive Secretary for approval of alternative safety measures. Alternative safety measures shall provide personnel protection at least equivalent to those specified in R313-15-603(2). At least one of the alternative measures shall include an entry-preventing interlock control based on a measurement of the radiation that ensures the absence of high radiation levels before an individual can gain access to the area where such sources of radiation are used.

(4) The entry control devices required by R313-15-603(2) and (3) shall be established in such a way that no individual will be prevented from leaving the area.

R313-15-701. Use of Process or Other Engineering Controls.

The licensee or registrant shall use, to the extent practicable, process or other engineering controls, such as, containment or ventilation, to control the concentrations of radioactive material in air.

R313-15-702. Use of Other Controls.

When it is not practicable to apply process or other engineering controls to control the concentrations of radioactive material in air to values below those that define an airborne radioactivity area, the licensee or registrant shall, consistent with maintaining the total effective dose equivalent ALARA, increase monitoring and limit intakes by one or more of the following means:

(1) Control of access; or

(2) Limitation of exposure times; or

(3) Use of respiratory protection equipment; or

(4) Other controls.

R313-15-703. Use of Individual Respiratory Protection Equipment.

(1) If the licensee or registrant uses respiratory protection equipment to limit intakes pursuant to R313-15-702:

(a) Except as provided in R313-15-703(1)(b), the licensee or registrant shall use only respiratory protection equipment that is tested and certified or had certification extended by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration.

(b) If the licensee or registrant wishes to use equipment that has not been tested or certified by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration has not had certification extended by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration, or for which there is no schedule for testing or certification, the licensee or registrant shall submit an application for authorized use of that equipment, including a demonstration by testing, or a demonstration on the basis of reliable 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.

(c) The licensee or registrant shall implement and maintain a respiratory protection program that includes:

(i) Air sampling sufficient to identify the potential hazard, permit proper equipment selection, and estimate exposures; and

(ii) Surveys and bioassays, as appropriate, to evaluate actual intakes; and

(iii) Testing of respirators for operability immediately prior to each use; and

(iv) Written procedures regarding selection, fitting, issuance, maintenance, and testing of respirators, including testing for operability immediately prior to each use; supervision and training of personnel; monitoring, including air sampling and bioassays; and recordkeeping; and

(v) Determination by a physician prior to initial fitting of respirators, and at least every 12 months thereafter, that the individual user is physically able to use the respiratory protection equipment.

(d) The licensee or registrant shall issue a written policy statement on respirator usage covering:

(i) The use of process or other engineering controls, instead of respirators; and

(ii) The routine, nonroutine, and emergency use of respirators; and

(iii) The length of periods of respirator use and relief from respirator use.

(e) The licensee or registrant 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.

(f) The licensee or registrant shall use respiratory protection equipment within the equipment manufacturer's expressed limitations for type and mode of use and shall provide proper visual, communication, and other special capabilities, such as

adequate skin protection, when needed.

(2) When estimating exposure of individuals to airborne radioactive materials, the licensee or registrant may make allowance for respiratory protection equipment used to limit intakes pursuant to R313-15-702, provided that the following conditions, in addition to those in R313-15-703(1), are satisfied:

(a) The licensee or registrant selects respiratory protection equipment that provides a protection factor, specified in Appendix A of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference, greater than the multiple by which peak concentrations of airborne radioactive materials in the working area are expected to exceed the values specified in Appendix B, Table I, Column 3 of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference. However, if the selection of respiratory protection equipment with a protection factor greater than the peak concentration is inconsistent with the goal specified in R313-15-702 of keeping the total effective dose equivalent ALARA, the licensee or registrant may select respiratory protection equipment with a lower protection factor provided that such a selection would result in a total effective dose equivalent that is ALARA. The concentration of radioactive material in the air that is inhaled when respirators are worn may be initially estimated by dividing the average concentration in air, during each period of uninterrupted use, by the protection factor. If the exposure is later found to be greater than initially estimated, the corrected value shall be used; if the exposure is later found to be less than initially estimated, the corrected value may be used.

(b) The licensee or registrant shall obtain authorization from the Executive Secretary before assigning respiratory protection factors in excess of those specified in Appendix A of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference. The Executive Secretary may authorize a licensee or registrant to use higher protection factors on receipt of an application that:

(i) Describes the situation for which a need exists for higher protection factors, and

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

(3) In an emergency, the licensee or registrant shall use as emergency equipment only respiratory protection equipment that has been specifically certified or had certification extended for emergency use by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration.

(d) The licensee or registrant shall notify the Executive Secretary in writing at least 30 days before the date that respiratory protection equipment is first used pursuant to either R313-15-703(1) or (2).

R313-15-801. Security of Stored Sources of Radiation.

The licensee or registrant shall secure from unauthorized removal or access licensed or registered sources of radiation that are stored in controlled or unrestricted areas.

R313-15-802. Control of Sources of Radiation not in Storage.

(1) The licensee or registrant shall control and maintain constant surveillance of licensed or registered radioactive material that is in a controlled or unrestricted area and that is not in storage or in a patient.

(2) The registrant shall maintain control of radiation machines that are in a controlled or unrestricted area and that are not in storage.

R313-15-901. Caution Signs.

(1) Standard Radiation Symbol. Unless otherwise authorized by the Executive Secretary, the symbol prescribed by 10 CFR 20.1901, 1993 ed., which is incorporated by reference, shall use the colors magenta, or purple, or black on yellow background. The symbol prescribed is the three-bladed design as follows:

(a) Cross-hatched area is to be magenta, or purple, or black, and

(b) The background is to be yellow.

(2) Exception to Color Requirements for Standard Radiation Symbol. Notwithstanding the requirements of 10 CFR 20.1901a, 1993 ed., which is incorporated by reference, licensees or registrants are authorized to label sources, source holders, or device components containing sources of radiation that are subjected to high temperatures, with conspicuously etched or stamped radiation caution symbols and without a color requirement.

(3) Additional Information on Signs and Labels. In addition to the contents of signs and labels prescribed in R313-15, the licensee or registrant shall provide, on or near the required signs and labels, additional information, as appropriate, to make individuals aware of potential radiation exposures and to minimize the exposures.

R313-15-902. Posting Requirements.

(1) Posting of Radiation Areas. The licensee or registrant shall post each radiation area with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION, RADIATION AREA."

(2) Posting of High Radiation Areas. The licensee or registrant shall post each high radiation area with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION, HIGH RADIATION AREA" or "DANGER, HIGH RADIATION AREA."

(3) Posting of Very High Radiation Areas. The licensee or registrant shall post each very high radiation area with a conspicuous sign or signs bearing the radiation symbol and words "GRAVE DANGER, VERY HIGH RADIATION AREA."

(4) Posting of Airborne Radioactivity Areas. The licensee or registrant shall post each airborne radioactivity area with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION, AIRBORNE RADIOACTIVITY AREA" or "DANGER, AIRBORNE RADIOACTIVITY AREA."

(5) Posting of Areas or Rooms in which Licensed or Registered Material is Used or Stored. The licensee or registrant shall post each area or room in which there is used or stored an amount of licensed or registered material exceeding ten times the quantity of

such material specified in Appendix C of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference, with a conspicuous sign or signs bearing the radiation symbol and the words "CAUTION, RADIOACTIVE MATERIAL" or "DANGER, RADIOACTIVE MATERIAL."

R313-15-903. Exceptions to Posting Requirements.

(1) A licensee or registrant is not required to post caution signs in areas or rooms containing sources of radiation for periods of less than eight hours, if each of the following conditions is met:

(a) The sources of radiation are constantly attended during these periods by an individual who takes the precautions necessary to prevent the exposure of individuals to sources of radiation in excess of the limits established in R313-15; and

(b) The area or room is subject to the licensee's or registrant's control.

(2) Rooms or other areas in hospitals that are occupied by patients are not required to be posted with caution signs pursuant to R313-15-902 provided that the patient could be released from confinement pursuant to R313-32-75.

(3) A room or area is not required to be posted with a caution sign because of the presence of a sealed source provided the radiation level at 30 centimeters from the surface of the sealed source container or housing does not exceed 0.05 mSv (0.005 rem) per hour.

(4) A room or area is not required to be posted with a caution sign because of the presence of radiation machines used solely for diagnosis in the healing arts.

R313-15-904. Labeling Containers and Radiation Machines.

(1) The licensee or registrant shall ensure that each container of licensed or registered material bears a durable, clearly visible label bearing the radiation symbol and the words "CAUTION, RADIOACTIVE MATERIAL" or "DANGER, RADIOACTIVE MATERIAL." The label shall also provide information, such as the radionuclides present, an estimate of the quantity of radioactivity, the date for which the activity is estimated, radiation levels, kinds of materials, and mass enrichment, to permit individuals handling or using the containers, or working in the vicinity of the containers, to take precautions to avoid or minimize exposures.

(2) Each licensee or registrant shall, prior to removal or disposal of empty uncontaminated containers to unrestricted areas, remove or deface the radioactive material label or otherwise clearly indicate that the container no longer contains radioactive materials.

(3) Each registrant shall ensure that each radiation machine is labeled in a conspicuous manner which cautions individuals that radiation is produced when it is energized.

R313-15-905. Exemptions to Labeling Requirements.

A licensee or registrant is not required to label:

(1) Containers holding licensed or registered material in quantities less than the quantities listed in Appendix C of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference;

or

(2) Containers holding licensed or registered material in concentrations less than those specified in Table III of Appendix B of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference; or

(3) Containers attended by an individual who takes the precautions necessary to prevent the exposure of individuals in excess of the limits established by R313-15; or

(4) Containers when they are in transport and packaged and labeled in accordance with the rules of the U.S. Department of Transportation; or

(5) 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

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

R313-15-906. Procedures for Receiving and Opening Packages.

(1) Each licensee or registrant who expects to receive a package containing quantities of radioactive material in excess of a Type A quantity, as defined in R313-19-4 and R313-19-100(19), shall make arrangements to receive:

(a) The package when the carrier offers it for delivery; or

(b) The notification of the arrival of the package at the carrier's terminal and to take possession of the package expeditiously.

(2) Each licensee or registrant shall:

(a) Monitor the external surfaces of a labeled package for radioactive contamination unless the package contains only radioactive material in the form of gas or in special form as defined in R313-12-3; and

(b) 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, as defined in R313-19-4 and R313-19-100(19); and

(c) 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.

(3) The licensee or registrant shall perform the monitoring required by R313-15-906(2) as soon as practicable after receipt of the package, but not later than three hours after the package is received at the licensee's or registrant's facility if it is received during the licensee's or registrant's normal working hours, or not later than three hours from the beginning of the next working day if it is received after working hours.

(4) The licensee or registrant shall immediately notify the final delivery carrier and, by telephone and telegram, mailgram, or facsimile, the Executive Secretary when:

(a) Removable radioactive surface contamination exceeds the limits of R313-19-100(13)(h); or

(b) External radiation levels exceed the limits of R313-19-100(13)(i) and j.

(5) Each licensee or registrant shall:

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

(b) Ensure that the procedures are followed and that due consideration is given to special instructions for the type of package being opened.

(6) Licensees or registrants transferring special form sources in vehicles owned or operated by the licensee or registrant to and from a work site are exempt from the contamination monitoring requirements of R313-15-906(2), but are not exempt from the monitoring requirement in R313-15-906(2) for measuring radiation levels that ensures that the source is still properly lodged in its shield.

R313-15-1001. Waste Disposal - General Requirements.

(1) A licensee or registrant shall dispose of licensed or registered material only:

(a) By transfer to an authorized recipient as provided in R313-15-1006 or in R313-21, R313-22, or R313-25, or to the U.S. Department of Energy; or

(b) By decay in storage; or

(c) By release in effluents within the limits in R313-15-301; or

(d) As authorized pursuant to R313-15-1002, R313-15-1003, R313-15-1004, or R313-15-1005.

(2) A person shall be specifically licensed or registered to receive waste containing licensed or registered material from other persons for:

(a) Treatment prior to disposal; or

(b) Treatment or disposal by incineration; or

(c) Decay in storage; or

(d) Disposal at a land disposal facility licensed pursuant to R313-25; or

(e) Storage until transferred to a storage or disposal facility authorized to receive the waste.

R313-15-1002. Method for Obtaining Approval of Proposed Disposal Procedures.

A licensee or registrant or applicant for a license or registration may apply to the Executive Secretary for approval of proposed procedures, not otherwise authorized in these rules, to dispose of licensed or registered material generated in the licensee's or registrant's operations. Each application shall include:

(1) A description of the waste containing licensed or registered material to be disposed of, including the physical and chemical properties that have an impact on risk evaluation, and the proposed manner and conditions of waste disposal; and

(2) An analysis and evaluation of pertinent information on

the nature of the environment; and

(3) The nature and location of other potentially affected facilities; and

(4) Analyses and procedures to ensure that doses are maintained ALARA and within the dose limits in R313-15.

R313-15-1003. Disposal by Release into Sanitary Sewerage.

(1) A licensee or registrant may discharge licensed or registered material into sanitary sewerage if each of the following conditions is satisfied:

(a) The material is readily soluble, or is readily dispersible biological material, in water; and

(b) The quantity of licensed or registered radioactive material that the licensee or registrant releases into the sewer in one month divided by the average monthly volume of water released into the sewer by the licensee or registrant does not exceed the concentration listed in Table III of Appendix B of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference; and

(c) If more than one radionuclide is released, the following conditions shall also be satisfied:

(i) The licensee or registrant shall determine the fraction of the limit in Table III of Appendix B of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference, represented by discharges into sanitary sewerage by dividing the actual monthly average concentration of each radionuclide released by the licensee or registrant into the sewer by the concentration of that radionuclide listed in Table III of Appendix B of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference; and

(ii) The sum of the fractions for each radionuclide required by R313-15-1003(1)(c)(i) does not exceed unity; and

(d) The total quantity of licensed or registered radioactive material that the licensee or registrant releases into the sanitary sewerage system in a year does not exceed 185 GBq (five Ci) of hydrogen-3, 37 GBq (one Ci) of carbon-14, and 37 GBq (one Ci) of all other radioactive materials combined.

(2) Excreta from individuals undergoing medical diagnosis or therapy with radioactive material are not subject to the limitations contained in R313-15-1003(1).

R313-15-1004. Treatment or Disposal by Incineration.

A licensee or registrant may treat or dispose of licensed or registered material by incineration only in the amounts and forms specified in R313-15-1005 or as specifically approved by the Executive Secretary pursuant to R313-15-1002.

R313-15-1005. Disposal of Specific Wastes.

(1) A licensee or registrant may dispose of the following licensed or registered material as if it were not radioactive:

(a) 1.85 kBq (0.05 uCi), or less, of hydrogen-3 or carbon-14 per gram of medium used for liquid scintillation counting; and

(b) 1.85 kBq (0.05 uCi) or less, of hydrogen-3 or carbon-14 per gram of animal tissue, averaged over the weight of the entire animal.

(2) A licensee or registrant shall not dispose of tissue pursuant to R313-15-1005(1)(b) in a manner that would permit its use either as food for humans or as animal feed.

(3) The licensee or registrant shall maintain records in accordance with R313-15-1109.

R313-15-1006. Transfer for Disposal and Manifests.

(1) The requirements of R313-15-1006 and Appendix F of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference, are designed to control transfers of low-level radioactive waste intended for disposal at a licensed low-level radioactive waste disposal facility, establish a manifest tracking system, and supplement existing requirements concerning transfers and recordkeeping for those wastes.

(2) Each shipment of radioactive waste designated for disposal at a licensed low-level radioactive waste disposal facility shall be accompanied by a shipment manifest as specified in Section I of Appendix F of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference.

(3) Each shipment manifest shall include a certification by the waste generator as specified in Section II of Appendix F of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference.

(4) Each person involved in the transfer of waste for disposal or in the disposal of waste, including the waste generator, waste collector, waste processor, and disposal facility operator, shall comply with the requirements specified in Section III of Appendix F of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference.

R313-15-1007. Compliance with Environmental and Health Protection Rules.

Nothing in R313-15-1001, R313-15-1002, R313-15-1003, R313-15-1004, R313-15-1005, or R313-15-1006 relieves the licensee or registrant from complying with other applicable Federal, State and local rules governing any other toxic or hazardous properties of materials that may be disposed of pursuant to R313-15-1001, R313-15-1002, R313-15-1003, R313-15-1004, R313-15-1005, or R313-15-1006.

R313-15-1008. Classification and Characteristics of Low-Level Radioactive Waste.

(1) Classification of Radioactive Waste for Land Disposal

(a) Considerations. Determination of the classification of radioactive waste involves two considerations. First, consideration shall be given to the concentration of long-lived radionuclides (and their shorter-lived precursors) whose potential hazard will persist long after such precautions as institutional controls, improved waste form, and deeper disposal have ceased to be effective. These precautions delay the time when long-lived radionuclides could cause exposures. In addition, the magnitude of the potential dose is limited by the concentration and availability of the radionuclide at the time of exposure. Second, consideration shall be given to the concentration of shorter-lived radionuclides for which requirements on institutional controls, waste form, and

disposal methods are effective.

(b) Classes of waste.

(i) Class A waste is waste that is usually segregated from other waste classes at the disposal site. The physical form and characteristics of Class A waste shall meet the minimum requirements set forth in R313-15-1008(2)(a). If Class A waste also meets the stability requirements set forth in R313-15-1008(2)(b), it is not necessary to segregate the waste for disposal.

(ii) Class B waste is waste that shall meet more rigorous requirements on waste form to ensure stability after disposal. The physical form and characteristics of Class B waste shall meet both the minimum and stability requirements set forth in R313-15-1008(2).

(iii) Class C waste is waste that not only shall meet more rigorous requirements on waste form to ensure stability but also requires additional measures at the disposal facility to protect against inadvertent intrusion. The physical form and characteristics of Class C waste shall meet both the minimum and stability requirements set forth in R313-15-1008(2).

(c) Classification determined by long-lived radionuclides. If the radioactive waste contains only radionuclides listed in Table I, classification shall be determined as follows:

(i) If the concentration does not exceed 0.1 times the value in Table I, the waste is Class A.

(ii) If the concentration exceeds 0.1 times the value in Table I, but does not exceed the value in Table I, the waste is Class C.

(iii) If the concentration exceeds the value in Table I, the waste is not generally acceptable for land disposal.

(iv) For wastes containing mixtures of radionuclides listed in Table I, the total concentration shall be determined by the sum of fractions rule described in R313-15-1008(1)(g).

TABLE I

	Concentration	
Radionuclide	curie/cubic meter(1)	nanocurie/gram(2)
C-14	8	
C-14 in activated metal	80	
Ni-59 in activated metal	220	
Nb-94 in activated metal	0.2	
Tc-99	3	
I-129	0.08	
Alpha emitting transuranic radionuclides with half-life greater than five years		100
Pu-241		3,500
Cm-242		20,000
Ra-226		100

NOTE: (1) To convert the Ci/m^3 values to gigabecquerel (GBq)/cubic meter, multiply the Ci/m^3 value by 37.
(2) To convert the nCi/g values to becquerel (Bq)/gram, multiply

the nCi/g value by 37.

(d) Classification determined by short-lived radionuclides. If the waste does not contain any of the radionuclides listed in Table I, classification shall be determined based on the concentrations shown in Table II. However, as specified in R313-15-1008(1)(f), if radioactive waste does not contain any nuclides listed in either Table I or II, it is Class A.

(i) If the concentration does not exceed the value in Column 1, the waste is Class A.

(ii) If the concentration exceeds the value in Column 1 but does not exceed the value in Column 2, the waste is Class B.

(iii) If the concentration exceeds the value in Column 2 but does not exceed the value in Column 3, the waste is Class C.

(iv) If the concentration exceeds the value in Column 3, the waste is not generally acceptable for near-surface disposal.

(v) For wastes containing mixtures of the radionuclides listed in Table II, the total concentration shall be determined by the sum of fractions rule described in R313-15-1008(1)(g).

TABLE II

Radionuclide	Concentration, curie/cubic meter(1)		
	Column 1	Column 2	Column 3
Total of all radionuclides with less than 5-year half-life	700	(2)	(2)
H-3	40	(2)	(2)
Co-60	700	(2)	(2)
Ni-63	3.5	70	700
Ni-63 in activated metal	35	700	7000
Sr-90	0.04	150	7000
Cs-137	1	44	4600

NOTE: (1) To convert the Ci/m^3 value to gigabecquerel (GBq)/cubic meter, multiply the Ci/m^3 value by 37.

(2) There are no limits established for these radionuclides in Class B or C wastes. Practical considerations such as the effects of external radiation and internal heat generation on transportation, handling, and disposal will limit the concentrations for these wastes. These wastes shall be Class B unless the concentrations of other radionuclides in Table II determine the waste to be Class C independent of these radionuclides.

(e) Classification determined by both long- and short-lived radionuclides. If the radioactive waste contains a mixture of radionuclides, some of which are listed in Table I and some of which are listed in Table II, classification shall be determined as follows:

(i) If the concentration of a radionuclide listed in Table I is less than 0.1 times the value listed in Table I, the class shall be that determined by the concentration of radionuclides listed in

Table II.

(ii) If the concentration of a radionuclide listed in Table I exceeds 0.1 times the value listed in Table I, but does not exceed the value in Table I, the waste shall be Class C, provided the concentration of radionuclides listed in Table II does not exceed the value shown in Column 3 of Table II.

(f) Classification of wastes with radionuclides other than those listed in Tables I and II. If the waste does not contain any radionuclides listed in either Table I or II, it is Class A.

(g) The sum of the fractions rule for mixtures of radionuclides. For determining classification for waste that contains a mixture of radionuclides, it is necessary to determine the sum of fractions by dividing each radionuclide's concentration by the appropriate limit and adding the resulting values. The appropriate limits shall all be taken from the same column of the same table. The sum of the fractions for the column shall be less than 1.0 if the waste class is to be determined by that column. Example: A waste contains Sr-90 in a concentration of 1.85 TBq/m^3 (50 Ci/m^3) and Cs-137 in a concentration of 814 GBq/m^3 (22 Ci/m^3). Since the concentrations both exceed the values in Column 1, Table II, they shall be compared to Column 2 values. For Sr-90 fraction, 50/150 = 0.33., for Cs-137 fraction, 22/44 = 0.5; the sum of the fractions = 0.83. Since the sum is less than 1.0, the waste is Class B.

(h) Determination of concentrations in wastes. The concentration of a radionuclide may be determined by indirect methods such as use of scaling factors which relate the inferred concentration of one radionuclide to another that is measured, or radionuclide material accountability, if there is reasonable assurance that the indirect methods can be correlated with actual measurements. The concentration of a radionuclide may be averaged over the volume of the waste, or weight of the waste if the units are expressed as becquerel (nanocurie) per gram.

(2) 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.

(i) 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 Part D, the site license conditions shall govern.

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

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

(iv) 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 one percent of the volume.

(v) 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.

(vi) 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 R313-15-1008(2)(a)(viii).

(vii) Waste shall not be pyrophoric. Pyrophoric materials contained in wastes shall be treated, prepared, and packaged to be nonflammable.

(viii) Wastes in a gaseous form shall be packaged at an absolute pressure that does not exceed 1.5 atmospheres at 20 degrees celsius. Total activity shall not exceed 3.7 TBq (100 Ci) per container.

(ix) 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.

(i) 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.

(ii) Notwithstanding the provisions in R313-15-1008(2)(a)(iii) and (iv), 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 one percent of the volume of the waste when the waste is in a disposal container designed to ensure stability, or 0.5 percent of the volume of the waste for waste processed to a stable form.

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

(3) Labeling. Each package of waste shall be clearly labeled to identify whether it is Class A, Class B, or Class C waste, in accordance with R313-15-1008(1).

R313-15-1101. Records - General Provisions.

(1) Each licensee or registrant shall use the SI units becquerel, gray, sievert and coulomb per kilogram, or the special units, curie, rad, rem, and roentgen, including multiples and subdivisions, and shall clearly indicate the units of all quantities on records required by R313-15.

(2) The licensee or registrant shall make a clear distinction among the quantities entered on the records required by R313-15, such as, total effective dose equivalent, total organ dose equivalent, shallow dose equivalent, eye dose equivalent, deep dose

equivalent, or committed effective dose equivalent.

R313-15-1102. Records of Radiation Protection Programs.

(1) Each licensee or registrant shall maintain records of the radiation protection program, including:

(a) The provisions of the program; and

(b) Audits and other reviews of program content and implementation.

(2) The licensee or registrant shall retain the records required by R313-15-1102(1)(a) until the Executive Secretary terminates each pertinent license or registration requiring the record. The licensee or registrant shall retain the records required by R313-15-1102(1)(b) for three years after the record is made.

R313-15-1103. Records of Surveys.

(1) Each licensee or registrant shall maintain records showing the results of surveys and calibrations required by R313-15-501 and R313-15-906(2). The licensee or registrant shall retain these records for three years after the record is made.

(2) The licensee or registrant shall retain each of the following records until the Executive Secretary terminates each pertinent license or registration requiring the record:

(a) Records of the results of surveys to determine the dose from external sources of radiation used, in the absence of or in combination with individual monitoring data, in the assessment of individual dose equivalents; and

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

(c) Records showing the results of air sampling, surveys, and bioassays required pursuant to R313-15-703(1)(c)(i) and (ii); and

(d) Records of the results of measurements and calculations used to evaluate the release of radioactive effluents to the environment.

R313-15-1104. Records of Tests for Leakage or Contamination of Sealed Sources.

Records of tests for leakage or contamination of sealed sources required by R313-15-401 shall be kept in units of becquerel or microcurie and maintained for inspection by the Executive Secretary for five years after the records are made.

R313-15-1105. Records of Prior Occupational Dose.

The licensee or registrant shall retain the records of prior occupational dose and exposure history as specified in R313-15-205 on form DRC-05 or equivalent until the Executive Secretary terminates each pertinent license requiring this record. The licensee or registrant shall retain records used in preparing form DRC-05 or equivalent for three years after the record is made.

R313-15-1106. Records of Planned Special Exposures.

(1) For each use of the provisions of R313-15-206 for planned special exposures, the licensee or registrant shall maintain records that describe:

(a) The exceptional circumstances requiring the use of a planned special exposure; and

(b) The name of the management official who authorized the planned special exposure and a copy of the signed authorization; and

(c) What actions were necessary; and

(d) Why the actions were necessary; and

(e) What precautions were taken to assure that doses were maintained ALARA; and

(f) What individual and collective doses were expected to result; and

(g) The doses actually received in the planned special exposure.

(2) The licensee or registrant shall retain the records until the Executive Secretary terminates each pertinent license or registration requiring these records.

R313-15-1107. Records of Individual Monitoring Results.

(1) Recordkeeping Requirement. Each licensee or registrant shall maintain records of doses received by all individuals for whom monitoring was required pursuant to R313-15-502, and records of doses received during planned special exposures, accidents, and emergency conditions. Assessments of dose equivalent and records made using units in effect before January 1, 1994, need not be changed. These records shall include, when applicable:

(a) The deep dose equivalent to the whole body, eye dose equivalent, shallow dose equivalent to the skin, and shallow dose equivalent to the extremities; and

(b) The estimated intake of radionuclides, see R313-15-202; and

(c) The committed effective dose equivalent assigned to the intake of radionuclides; and

(d) The specific information used to calculate the committed effective dose equivalent pursuant to R313-15-204(3); and

(e) The total effective dose equivalent when required by R313-15-202; and

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

(2) Recordkeeping Frequency. The licensee or registrant shall make entries of the records specified in R313-15-1107(1) at intervals not to exceed one year.

(3) Recordkeeping Format. The licensee or registrant shall maintain the records specified in R313-15-1107(1) on form DRC-06, in accordance with the instructions for form DRC-06, or in clear and legible records containing all the information required by form DRC-06.

(4) 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, including the estimated date of conception, shall also be kept on file, but may be maintained separately from the dose records.

(5) The licensee or registrant shall retain each required form or record until the Executive Secretary terminates each pertinent license or registration requiring the record.

R313-15-1108. Records of Dose to Individual Members of the Public.

(1) Each licensee or registrant shall maintain records sufficient to demonstrate compliance with the dose limit for individual members of the public. See R313-15-301.

(2) The licensee or registrant shall retain the records required by R313-15-1108(1) until the Executive Secretary terminates each pertinent license or registration requiring the record.

R313-15-1109. Records of Waste Disposal.

(1) Each licensee or registrant shall maintain records of the disposal of licensed or registered materials made pursuant to R313-15-1002, R313-15-1003, R313-15-1004, R313-15-1005, R313-25, and disposal by burial in soil, including burials authorized before January 28, 1981.

(2) The licensee or registrant shall retain the records required by R313-15-1109(1) until the Executive Secretary terminates each pertinent license or registration requiring the record.

R313-15-1110. Records of Testing Entry Control Devices for Very High Radiation Areas.

(1) Each licensee or registrant shall maintain records of tests made pursuant to R313-15-603(2)(i) on entry control devices for very high radiation areas. These records shall include the date, time, and results of each such test of function.

(2) The licensee or registrant shall retain the records required by R313-15-1110(1) for three years after the record is made.

R313-15-1111. Form of Records.

Each record required by R313-15 shall be legible throughout the specified retention period. The record shall be the original or a reproduced copy or a microform, provided that the copy or microform is authenticated by authorized personnel and that the microform is capable of producing a clear copy throughout the required retention period or the record may also be stored in electronic media with the capability for producing legible, accurate, and complete records during the required retention period. Records, such as letters, drawings, and specifications, shall include all pertinent information, such as stamps, initials, and signatures. The licensee shall maintain adequate safeguards against tampering with and loss of records.

R313-15-1201. Reports of Stolen, Lost, or Missing Licensed or Registered Sources of Radiation.

(1) Telephone Reports. Each licensee or registrant shall

report to the Executive Secretary by telephone as follows:

(a) Immediately after its occurrence becomes known to the licensee or registrant, stolen, lost, or missing licensed or registered radioactive material in an aggregate quantity equal to or greater than 1,000 times the quantity specified in Appendix C of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference, under such circumstances that it appears to the licensee or registrant that an exposure could result to individuals in unrestricted areas; or

(b) Within 30 days after its occurrence becomes known to the licensee or registrant, lost, stolen, or missing licensed or registered radioactive material in an aggregate quantity greater than ten times the quantity specified in Appendix C of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference, that is still missing.

(c) Immediately after its occurrence becomes known to the registrant, a stolen, lost, or missing radiation machine.

(2) Written Reports. Each licensee or registrant required to make a report pursuant to R313-15-1201(1) shall, within 30 days after making the telephone report, make a written report to the Executive Secretary setting forth the following information:

(a) A description of the licensed or registered source of radiation involved, including, for radioactive material, the kind, quantity, and chemical and physical form; and, for radiation machines, the manufacturer, model and serial number, type and maximum energy of radiation emitted;

(b) A description of the circumstances under which the loss or theft occurred; and

(c) A statement of disposition, or probable disposition, of the licensed or registered source of radiation involved; and

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

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

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

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

(4) The licensee or registrant shall prepare any report filed with the Executive Secretary pursuant to R313-15-1201 so that names of individuals who may have received exposure to radiation are stated in a separate and detachable portion of the report.

R313-15-1202. Notification of Incidents.

(1) Immediate Notification. Notwithstanding other requirements for notification, each licensee or registrant shall immediately report 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:

(a) An individual to receive:

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

(ii) An eye dose equivalent of 0.75 Sv (75 rem) or more; or

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

(b) 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 occupational ALI. This provision does not apply to locations where personnel are not normally stationed during routine operations, such as hot-cells or process enclosures.

(2) Twenty-Four Hour Notification. Each licensee or registrant shall, within 24 hours of discovery of the event, report to the Executive Secretary 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:

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

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

(ii) An eye dose equivalent exceeding 0.15 Sv (15 rem); or

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

(b) 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. This provision does not apply to locations where personnel are not normally stationed during routine operations, such as hot-cells or process enclosures.

(3) The licensee or registrant shall prepare each report filed with the Executive Secretary pursuant to R313-15-1202 so that names of individuals who have received exposure to sources of radiation are stated in a separate and detachable portion of the report.

(4) Licensees or registrants shall make the reports required by R313-15-1202(1) and (2) to the Executive Secretary by telephone, telegram, mailgram, or facsimile to the Executive Secretary.

(5) The provisions of R313-15-1202 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 R313-15-1204.

R313-15-1203. Reports of Exposures, Radiation Levels, and Concentrations of Radioactive Material Exceeding the Limits.

(1) Reportable Events. In addition to the notification required by R313-15-1202, each licensee or registrant shall submit a written report within 30 days after learning of any of the following occurrences:

(a) Incidents for which notification is required by R313-15-1202; or

(b) Doses in excess of any of the following:

(i) The occupational dose limits for adults in R313-15-201; or

(ii) The occupational dose limits for a minor in R313-15-207;

or

(iii) The limits for an embryo/fetus of a declared pregnant woman in R313-15-208; or

(iv) The limits for an individual member of the public in R313-15-301; or

(v) Any applicable limit in the license or registration; or

(c) Levels of radiation or concentrations of radioactive material in:

(i) A restricted area in excess of applicable limits in the license or registration; or

(ii) An unrestricted area in excess of ten times the applicable limit set forth in R313-15 or in the license or registration, whether or not involving exposure of any individual in excess of the limits in R313-15-301; or

(d) For licensees subject to the provisions of U.S. Environmental Protection Agency's generally applicable environmental radiation standards in 40 CFR 190, levels of radiation or releases of radioactive material in excess of those standards, or of license conditions related to those standards.

(2) Contents of Reports.

(a) Each report required by R313-15-1203(1) shall describe the extent of exposure of individuals to radiation and radioactive material, including, as appropriate:

(i) Estimates of each individual's dose; and

(ii) The levels of radiation and concentrations of radioactive material involved; and

(iii) The cause of the elevated exposures, dose rates, or concentrations; and

(iv) Corrective steps taken or planned to ensure against a recurrence, including the schedule for achieving conformance with applicable limits, generally applicable environmental standards, and associated license or registration conditions.

(b) Each report filed pursuant to R313-15-1203(1) shall include for each individual exposed: the name, Social Security account number, and date of birth. With respect to the limit for the embryo/fetus in R313-15-208, the identifiers should be those of the declared pregnant woman. The report shall be prepared so that this information is stated in a separate and detachable portion of the report.

(3) All licensees or registrants who make reports pursuant to R313-15-1203(1) shall submit the report in writing to the Executive Secretary.

R313-15-1204. Reports of Planned Special Exposures.

The licensee or registrant shall submit a written report to the Executive Secretary within 30 days following any planned special exposure conducted in accordance with R313-15-206, informing the Executive Secretary that a planned special exposure was conducted and indicating the date the planned special exposure occurred and the information required by R313-15-1106.

R313-15-1207. Notifications and Reports to Individuals.

(1) Requirements for notification and reports to individuals of exposure to radiation or radioactive material are specified in

R313-18.

(2) When a licensee or registrant is required pursuant to R313-15-1203 to report to the Executive Secretary any exposure of an individual to radiation or radioactive material, the licensee or registrant shall also notify the individual. Such notice shall be transmitted at a time not later than the transmittal to the Executive Secretary, and shall comply with the provisions of R313-18.

R313-15-1208. Reports of Leaking or Contaminated Sealed Sources.

If the test for leakage or contamination required pursuant to R313-15-401 indicates a sealed source is leaking or contaminated, a report of the test shall be filed within five days with the Executive Secretary describing the equipment involved, the test results and the corrective action taken.

R313-15-1301. Vacating Premises.

Each specific licensee or registrant shall, no less than 30 days before vacating or relinquishing possession or control of premises which may have been contaminated with radioactive material as a result of his activities, notify the Executive Secretary in writing of intent to vacate. When deemed necessary by the Executive Secretary, the licensee shall decontaminate the premises in such a manner as the Executive Secretary may specify.

KEY: radioactive material, contamination, waste disposal, safety, surveys
1993 **19-3-104**
19-3-108

State of Utah
Administrative Rule Analysis
Notice of Proposed Rule/Change

D.A.R. FILE NUMBER:

CODE NUMBER
AGENCY - RULE - SECTION
R 313 - 15 -

Division of Administrative Rules
State Archives Building, State Capitol
Salt Lake City, Utah 84114
Telephone 538-3011

Department: Environmental Quality
Agency: Radiation Control
Address: 168 N 1950 W Rm 212
Salt Lake City Utah 84116
Contact Person: Craig Jones
Telephone: 536-4250

1. CODE TITLE OF RULE OR SECTION

Standards for Protection Against Radiation

2. REASON FOR AND SUMMARY OF RULE OR CHANGE

National and international radiation protection advisory groups have developed standards for protection against ionizing radiation. The proposed rule replaces current standards for protection against radiation with updated scientific information and new concepts of radiation protection, philosophy and methodology. The text reflects the State's responsibilities for all sources of radiation and not only byproduct, source and special nuclear material. The proposed rule will maintain the State's compatability requirements with Federal agency counterparts.

3. COST OR SAVINGS IMPACT OF RULE - UCA 63-46a-4(3)

STATE BUDGET: None

LOCAL GOV'T: None

PUBLIC: None

4. TYPE OF NOTICE

☒ PROPOSED RULE (☒ NEW ☐ AMEND ☐ REPEAL)

☐ CHANGE IN PROPOSED RULE (CHANGES PROPOSED RULE FILE NUMBER _____)

☐ 120-DAY RULE - UCA 63-46a-7

☐ FIVE-YEAR REVIEW / CONTINUATION

5. JUSTIFICATION FOR 120-DAY RULE CHECKED ABOVE - UCA 63-46a-7(1)

6. ☒ RULE AUTHORIZED BY STATE CODE / CONSTITUTION (CITATION): UCA 19-3-104

☐ RULE REQUIRED BY FEDERAL MANDATE (U.S. CODE, CFR, OR FED. REGISTER CITATION):

7. PUBLIC MAY PARTICIPATE IN RULEMAKING BY: (REQUIRED ONLY FOR PROPOSED RULES)

WRITTEN OR ORAL COMMENT UNTIL: 10/15/93

PUBLIC HEARING (MAY BE OPTIONAL) DATE: PLACE: TIME:

NOTE: PUBLIC MAY REQUEST HEARING IN ACCORDANCE WITH UCA 63-46a-5(2)(b)

THIS RULE/CHANGE MAY BECOME EFFECTIVE ON: 10/18/93

8. INDEXING INFORMATION

AGENCY NOTE: TEXT MUST BE IN CODE FORMAT

STATE STATUTE CITATION(S): UCA 19-3-104

KEY WORD(S): radioactive material, contamination, waste disposal, surveys, radiation

THE FULL TEXT OF ALL PROPOSED ADMINISTRATIVE RULES OR RULE CHANGES IS PUBLISHED IN THE UTAH STATE BULLETIN UNLESS EXCLUDED BECAUSE OF LENGTH AND SPACE LIMITATION. THE FULL TEXT MAY BE INSPECTED AT THE AGENCY (ADDRESS ABOVE) OR DIVISION OF ADMINISTRATIVE RULES.

9. AUTHORIZATION

William J. Sinclair, Executive Secretary 9/1/93

AGENCY HEAD OR DESIGNEE DATE

Utah Radiation Control Board

AGENCY

SEND WHITE & YELLOW TO D.A.R., YELLOW WILL BE RETURNED TO AGENCY

10. DIVISION OF ADMINISTRATIVE RULES

RECEIVED BY: DATE: TIME:

120-DAY RULE EFFECTIVE: LAPSES:

☐ TOO LONG TO PRINT PAGES:

12/90

56 FR 64980
effective date 10/18/94

R313. Environmental Quality, Radiation Control.
R313-19. Requirements of General Applicability to Licensing of Radioactive Material.
R313-19-1. Purpose and Authority.

(1) The purpose of this rule is to prescribe requirements governing the licensing of radioactive material.

(2) The rules set forth herein are adopted pursuant to the provisions of Sections 19-3-101 through 19-3-301.

R313-19-2. General.

(1) A person shall not receive, possess, use, transfer, own or acquire radioactive material except as authorized in a specific or general license issued pursuant to R313-21 or R313-22 or as otherwise provided in R313-19.

(2) In addition to the requirements of R313-19, R313-21 or R313-22, all licensees are subject to the requirements of R313-12, R313-15, and R313-18. Licensees engaged in industrial radiographic operations are subject to the requirements of R313-36, licensees using radionuclides in the healing arts are subject to the requirements of R313-32, licensees engaged in land disposal of radioactive material are subject to the requirements of R313-25, and licensees engaged in wireline and subsurface tracer studies are subject to the requirements of R313-38.

R313-19-4. Definitions.

As used in R313-19:

"Carrier" means a person engaged in the transportation of passengers or property by land or water as a common, contract, or private carrier, or by civil aircraft.

"Closed transport vehicle" means a transport vehicle equipped with a securely attached exterior enclosure that during normal transportation restricts the access of unauthorized persons to the cargo space containing the radioactive material. The enclosure may be either temporary or permanent but shall limit access from top, sides, and ends. In the case of packaged materials, it may be of the "see-through" type.

"Containment System" means the components of the packaging intended to retain the radioactive material during transport.

"Conveyance" means any vehicle, aircraft, vessel, freight container, or hold, compartment, or defined deck area of an inland waterway craft or seagoing vessel.

"Exclusive use", also referred to in other rules as "sole use" or "full load", means the sole use of conveyance by a single consignor and for which all initial, intermediate, and final loading and unloading are carried out in accordance with the direction of the consignor or consignee.

"Fissile material" means any special nuclear material consisting of or containing one or more fissile radionuclides. Fissile radionuclides are plutonium-238, plutonium-239, plutonium-241, uranium-233, and uranium-235. Neither natural nor depleted uranium is fissile material. Board jurisdiction extends only to special nuclear material if quantities are not sufficient to form a critical mass as defined in R313-12.

(a) Fissile Class I: means a package which may be transported in unlimited numbers and in any arrangement, and which requires no nuclear criticality safety controls during transportation. A transport index is not assigned for purposes of nuclear criticality safety but may be required because of external radiation levels.

(b) Fissile Class II: means a package which may be transported together with other packages in any arrangement but for criticality control in numbers which do not exceed an aggregate transport index of 50. These shipments require no other nuclear criticality safety control during transportation. Individual packages may have a transport index not less than 0.1 and not more than 10.

"Low specific activity material" means any of the following:

(a) uranium or thorium ores and physical or chemical concentrates of those ores;

(b) unirradiated natural or depleted uranium or unirradiated natural thorium;

(c) tritium oxide in aqueous solutions provided the concentration does not

exceed 5.0 millicuries (185.0 MBq) per milliliter;

(d) material in which the radioactivity is essentially uniformly distributed and in which the estimated average concentration per gram of contents does not exceed:

(i) 0.0001 millicurie (3.7 kBq) of radionuclides for which the A_2 quantity in R313-19-100 Table 4 is not more than 0.05 curie (1.85 GBq);

(ii) 0.005 millicurie (185.0 kBq) of radionuclides for which the A_2 quantity in R313-19-100 Table 4 is more than 0.05 curie, (1.85 GBq) but not more than 1 curie (37.0 GBq); or

(iii) 0.3 millicurie (11.1 MBq) of radionuclides for which the A_2 quantity in R313-19-100 Table 4 is more than one curie (37.0 GBq).

(e) objects of nonradioactive material externally contaminated with radioactive material, provided that the radioactive material is not readily dispersible and the surface contamination, when averaged over an area of one square meter, does not exceed 0.0001 millicurie (220,000 disintegrations per minute) per square centimeter (3.7 kBq/cm^2) of radionuclides for which the A_2 quantity in R313-19-100 Table 4 is not more than 0.05 curie (1.85 GBq), or 0.001 millicurie (2,200,000 disintegrations per minute) per square centimeter (37.0 kBq/cm^2) for other radionuclides.

"Normal form radioactive material" means radioactive material which has not been demonstrated to qualify as "special form radioactive material".

"Packaging" means the assembly of components necessary to ensure compliance with the packaging requirements of R313-19-100. It may consist of one or more receptacles, absorbent materials, spacing structures, thermal insulation, radiation shielding, and devices for cooling or absorbing mechanical shocks. The vehicle, tiedown systems and auxiliary equipment may be designated as part of the packaging.

"Regulations of the U.S. Department of Transportation" means the regulations in 49 CFR Parts 100 through 189.

"Specific activity" means the radioactivity of a radionuclide per unit mass of that nuclide. The specific activity of a material in which the radionuclide is essentially uniformly distributed is the radioactivity per unit mass of the material.

"Transport index" means the dimensionless number, rounded up to the first decimal place, placed on the label of a package to designate the degree of control to be exercised by the carrier during transportation. The transport index is the number expressing the maximum radiation level in millirem per hour at one meter from the surface of the package.

"Type A quantity" means a quantity of radioactive material, the aggregate radioactivity of which does not exceed A_1 for special form radioactive material or A_2 for normal form radioactive material, where A_1 and A_2 are given in R313-19-100 Table 4 or may be determined by procedures described in R313-19-100.

"Type B package" means a Type B packaging together with its radioactive contents. A Type B package design is designated as B(U) or B(M). B(U) refers to the need for unilateral approval of international shipments; B(M) refers to the need for multilateral approval. There is no distinction made in how packages with these designations may be used in domestic transportation. To determine their distinction for international transportation, refer to 49 CFR Part 173. A Type B package approved prior to September 6, 1983 was designated only as Type B. Limitations on its use are specified in R313-19-100(6).

"Type B packaging" means a packaging designed to retain the integrity of containment and shielding when subjected to the normal conditions of transport and hypothetical accident test conditions set forth in 10 CFR Part 71.

"Type B quantity" means a quantity of radioactive material greater than a Type A quantity.

R313-19-13. Exemptions.

(1) Source material.

(a) A person is exempt from R313-19, R313-21, and R313-22 to the extent that the person receives, possesses, uses, owns, or transfers source material in a chemical mixture, compound, solution or alloy in which the source material is by weight less than 1/20 of one percent (0.05 percent) of the mixture, compound, solution, or alloy.

(b) A person is exempt from R313-19, R313-21, and R313-22 to the extent

that the person receives, possesses, uses or transfers unrefined and unprocessed ore containing source material; provided, that, except as authorized in a specific license, such person shall not refine or process the ore.

(c) A person is exempt from R313-19, R313-21, and R313-22 to the extent that the person receives, possesses, uses or transfers:

(i) any quantities of thorium contained in:

(A) incandescent gas mantles,

(B) vacuum tubes,

(C) welding rods,

(D) electric lamps for illuminating purposes: provided that, each lamp does not contain more than 50 milligrams of thorium,

(E) germicidal lamps, sunlamps, and lamps for outdoor or industrial lighting provided that each lamp does not contain more than two grams of thorium,

(F) rare earth metals and compounds, mixtures, and products containing not more than 0.25 percent by weight thorium, uranium, or any combination of these, or

(G) personnel neutron dosimeters provided that each dosimeter does not contain more than 50 milligrams of thorium;

(ii) source material contained in the following products:

(A) glazed ceramic tableware, provided that the glaze contains not more than 20 percent by weight source material,

(B) piezoelectric ceramic containing not more than two percent by weight source material, or

(C) glassware containing not more than ten percent by weight source material, but not including commercially manufactured glass brick, pane glass, ceramic tile, or other glass or ceramic used in construction;

(iii) photographic film, negatives and prints containing uranium or thorium;

(iv) a finished product or part fabricated of, or containing, tungsten-thorium or magnesium-thorium alloys, provided that the thorium content of the alloy does not exceed four percent by weight and that this exemption shall not be deemed to authorize the chemical, physical, or metallurgical treatment or processing of the product or part;

(v) uranium contained in counterweights installed in aircraft, rockets, projectiles, and missiles, or stored or handled in connection with installation or removal of the counterweights, provided that:

(A) the counterweights are manufactured in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission authorizing distribution by the licensee pursuant to 10 CFR Part 40,

(B) each counterweight has been impressed with the following legend clearly legible through any plating or other covering: "DEPLETED URANIUM",

(C) each counterweight is durably and legibly labeled or marked with the identification of the manufacturer and the statement: "UNAUTHORIZED ALTERATIONS PROHIBITED",

(D) The requirements specified in R313-19-13(1)(c)(v)(B) and (C) need not be met by counterweights manufactured prior to December 31, 1969, provided that such counterweights are impressed with the legend, "CAUTION - RADIOACTIVE MATERIAL - URANIUM", as previously required by the rules, and

(E) the exemption contained in R313-19-13(1)(c)(v) shall not be deemed to authorize the chemical, physical, or metallurgical treatment or processing of counterweights other than repair or restoration of any plating or other covering;

(vi) natural or depleted uranium metal used as shielding constituting part of a shipping container which is conspicuously and legibly impressed with the legend "CAUTION - RADIOACTIVE SHIELDING - URANIUM" and the uranium metal is encased in mild steel or equally fire resistant metal of minimum wall thickness of one eighth inch (3.2 mm);

(vii) thorium contained in finished optical lenses, provided that each lens does not contain more than 30 percent by weight of thorium, and that this exemption shall not be deemed to authorize either:

(A) the shaping, grinding, or polishing of a lens or manufacturing processes other than the assembly of such lens into optical systems and devices without alteration of the lens, or

(B) the receipt, possession, use, or transfer of thorium contained in contact lenses, or in spectacles, or in eyepieces in binoculars or other optical

instruments;

(viii) uranium contained in detector heads for use in fire detection units, provided that each detector head contains not more than 0.005 microcurie (185.0 Bq) of uranium; or

(ix) thorium contained in a finished aircraft engine part containing nickel-thoria alloy, provided that:

(A) the thorium is dispersed in the nickel-thoria alloy in the form of finely divided thoria (thorium dioxide), and

(B) the thorium content in the nickel-thoria alloy does not exceed four percent by weight.

(d) The exemptions in R313-19-13(1)(c) do not authorize the manufacture of any of the products described.

(2) Radioactive material other than source material.

(a) Exempt concentrations.

(i) Except as provided in R313-19-13(2)(a)(ii) a person is exempt from R313-19, R313-21 and R313-22 to the extent that the person receives, possesses, uses, transfers, owns or acquires products or materials containing:

(A) radioactive material introduced in concentrations not in excess of those listed in R313-19-70, or

(B) natural occurring radioactive materials containing less than 15 picocuries per gram radium-226.

(ii) A person may not introduce radioactive material into a product or material knowing or having reason to believe that it will be transferred to persons exempt under R313-19-13(2)(a)(i) or equivalent regulations of a Licensing State, the U.S. Nuclear Regulatory Commission or an Agreement State, except in accordance with a specific license issued pursuant to R313-22-75(1) or the general license provided in R313-19-30.

(b) Exempt quantities.

(i) Except as provided in R313-19-13(2)(b)(ii) and (iii) a person is exempt from these rules to the extent that the person receives, possesses, uses, transfers, owns, or acquires radioactive material in individual quantities which do not exceed the applicable quantity set forth in R313-19-71.

(ii) R313-19-13(2)(b), does not authorize the production, packaging or repackaging of radioactive material for purposes of commercial distribution, or the incorporation of radioactive material into products intended for commercial distribution.

(iii) A person may not, for purposes of commercial distribution, transfer radioactive material in the individual quantities set forth in R313-19-71, knowing or having reason to believe that the quantities of radioactive material will be transferred to persons exempt under R313-19-13(2)(b) or equivalent regulations of a Licensing State, the U.S. Nuclear Regulatory Commission or an Agreement State, except in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission, pursuant to 10 C.F.R. Part 32 or by the Executive Secretary pursuant to R313-22-75(2), which license states that the radioactive material may be transferred by the licensee to persons exempt under R313-19-13(2)(b) or the equivalent regulations of a Licensing State, the U.S. Nuclear Regulatory Commission or an Agreement State.

(iv) A person who possesses radioactive material received or acquired prior to September 25, 1971, under the general license formerly provided in 10 C.F.R. Part 31.5 is exempt from the requirements for a license set forth in R313-19 to the extent that the person possesses, uses, transfers or owns the radioactive material. This exemption does not apply for radium-226.

(c) Exempt items.

(i) Certain items containing radioactive material. Except for persons who apply radioactive material to, or persons who incorporate radioactive material into the following products, a person is exempt from these rules to the extent that person receives, possesses, uses, transfers, owns or acquires the following products:

(A) Timepieces or hands or dials containing not more than the following specified quantities of radioactive material and not exceeding the following specified levels of radiation:

(I) 25 millicuries (925.0 MBq) of tritium per timepiece;

(II) five millicuries (185.0 MBq) of tritium per hand;

(III) 15 millicuries (555.0 MBq) of tritium per dial. Bezels when used

shall be considered as part of the dial;

(IV) 100 microcuries (3.7 MBq) of promethium-147 per watch or 200 microcuries (7.4 MBq) of promethium-147 per any other timepiece;

(V) 20 microcuries (0.74 MBq) of promethium-147 per watch hand or 40 microcuries (1.48 MBq) of promethium-147 per other timepiece hand;

(VI) 60 microcuries (2.22 MBq) of promethium-147 per watch dial or 120 microcuries (4.44 MBq) of promethium-147 per other timepiece dial. Bezels when used shall be considered as part of the dial;

(VII) the radiation dose rate from hands and dials containing promethium-147 will not exceed, when measured through 50 milligrams per square centimeter of absorber:

for wrist watches, 0.1 millirad (1.0 uGy) per hour at ten centimeters from any surface;

for pocket watches, 0.1 millirad (1.0 uGy) per hour at one centimeter from any surface;

for other timepieces, 0.2 millirad (2.0 uGy) per hour at ten centimeters from any surface;

(VIII) one microcurie (37.0 kBq) of radium-226 per timepiece in timepieces manufactured prior to the effective date of these rules.

(B) Lock illuminators containing not more than 15 millicuries (555.0 MBq) of tritium or not more than two millicuries (74.0 MBq) of promethium-147 installed in automobile locks. The levels of radiation from each lock illuminator containing promethium-147 will not exceed one millirad (10 uGy) per hour at one centimeter from any surface when measured through 50 milligrams per square centimeter of absorber.

(C) Precision balances containing not more than one millicurie (37.0 MBq) of tritium per balance or not more than 0.5 millicurie (18.5 MBq) of tritium per balance part.

(D) Automobile shift quadrants containing not more than 25 millicuries (925 MBq) of tritium.

(E) Marine compasses containing not more than 750 millicuries (27.8 GBq) of tritium gas and other marine navigational instruments containing not more than 250 millicuries (9.25 GBq) of tritium gas.

(F) Thermostat dials and pointers containing not more than 25 millicuries (925.0 MBq) of tritium per thermostat.

(G) Electron tubes, including spark gap tubes, power tubes, gas tubes including glow lamps, receiving tubes, microwave tubes, indicator tubes, pick-up tubes, radiation detection tubes, and other completely sealed tubes that are designed to conduct or control electrical currents; provided that each tube does not contain more than one of the following specified quantities of radioactive material:

(I) 150 millicuries (5.55 GBq) of tritium per microwave receiver protector tube or ten millicuries (370.0 MBq) of tritium per any other electron tube;

(II) one microcurie (37.0 kBq) of cobalt-60;

(III) five microcuries (185.0 kBq) of nickel-63;

(IV) 30 microcuries (1.11 MBq) of krypton-85;

(V) five microcuries (185.0 kBq) of cesium-137;

(VI) 30 microcuries (1.11 MBq) of promethium-147;

(VII) one microcurie (37.0 kBq) of radium-226;

and provided further, that the radiation dose rate from each electron tube containing radioactive material will not exceed one millirad (10.0 uGy) per hour at one centimeter from any surface when measured through seven milligrams per square centimeter of absorber.

(H) Ionizing radiation measuring instruments containing, for purposes of internal calibration or standardization, one or more sources of radioactive material, provided that:

(I) each source contains no more than one exempt quantity set forth in R313-19-71; and

(II) each instrument contains no more than ten exempt quantities. For purposes of this requirement, an instrument's source(s) may contain either one type or different types of radionuclides and an individual exempt quantity may be composed of fractional parts of one or more of exempt quantities in R313-19-71, provided that the sum of the fractions shall not exceed unity;

(III) for purposes of R313-19-13(2)(c)(i)(H), 0.05 microcurie (1.85 kBq)

of americium-241 is considered an exempt quantity under R313-19-71.

(I) Spark gap irradiators containing not more than one microcurie (37.0 kBq) of cobalt-60 per spark gap irradiator for use in electrically ignited fuel oil burners having a firing rate of at least three gallons (11.4 liters) per hour.

(ii) Self-luminous products containing radioactive material.

(A) Tritium, krypton-85 or promethium-147. Except for persons who manufacture, process or produce self-luminous products containing tritium, krypton-85 or promethium-147, a person is exempt from these rules to the extent that the person receives, possesses, uses, transfers, owns, or acquires tritium, krypton-85 or promethium-147 in self-luminous products manufactured, processed, produced, imported or transferred in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission pursuant to 10 C.F.R. Part 32.22, which license authorizes the transfer of the product to persons who are exempt from regulatory requirements. The exemption in R313-19-13(2)(c)(ii) does not apply to tritium, krypton-85, or promethium-147 used in products for frivolous purposes or in toys or adornments.

(B) Radium-226. A person is exempt from these rules, to the extent that such person receives, possesses, uses, transfers, or owns articles containing less than 0.1 microcurie (3.7 kBq) of radium-226 which were acquired prior to the effective date of these rules.

(iii) Gas and aerosol detectors containing radioactive material.

(A) Except for persons who manufacture, process, or produce gas and aerosol detectors containing radioactive material, a person is exempt from these rules to the extent that the person receives, possesses, uses, transfers, owns, or acquires radioactive material in gas and aerosol detectors designed to protect life or property from fires and airborne hazards, provided that detectors containing radioactive material shall have been manufactured, imported, or transferred in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission pursuant to 10 C.F.R. Part 32.26, or a Licensing State pursuant to R313-22-75(3) or equivalent requirements, which authorizes the transfer of the detectors to persons who are exempt from regulatory requirements.

(B) Gas and aerosol detectors previously manufactured and distributed to general licensees in accordance with a specific license issued by an Agreement State shall be considered exempt under R313-19-13(2)(c)(iii)(A), provided that the device is labeled in accordance with the specific license authorizing distribution of the general licensed device, and provided further that they meet the requirements of R313-22-75(3).

(C) Gas and aerosol detectors containing naturally occurring and accelerator-produced radioactive material (NARM) previously manufactured and distributed in accordance with a specific license issued by a Licensing State shall be considered exempt under R313-19-13(2)(c)(iii)(A), provided that the device is labeled in accordance with the specific license authorizing distribution, and provided further that they meet the requirements of R313-22-75(3).

(iv) Resins containing scandium-46 and designed for sand consolidation in oil wells. A person is exempt from these rules to the extent that the person receives, possesses, uses, transfers, owns or acquires synthetic plastic resins containing scandium-46 which are designed for sand consolidation in oil wells. The resins shall have been manufactured or imported in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission, or shall have been manufactured in accordance with the specifications contained in a specific license issued by the Executive Secretary or an Agreement State to the manufacturer of resins pursuant to licensing requirements equivalent to those in 10 C.F.R. Part 32.16 and 32.17. This exemption does not authorize the manufacture of any resins containing scandium-46.

(v) With respect to R313-19-13(2)(b)(iii), R313-19-13(2)(c)(i) and (iii), the authority to transfer possession or control by the manufacturer, processor, or producer of equipment, devices, commodities, or other products containing byproduct material whose subsequent possession, use, transfer, and disposal by other persons is exempted from regulatory requirements may be obtained only from the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

R313-19-20. Types of Licenses.

Licenses for radioactive materials are of two types: general and specific.

(1) General licenses provided in R313-21 are effective without the filing of applications with the Executive Secretary or the issuance of licensing documents to the particular persons, although the filing of a certificate with the Executive Secretary may be required by the particular general license. The general licensee is subject to the other applicable portions of these rules and limitations of the general license.

(2) Specific licenses require the submission of an application to the Executive Secretary and the issuance of a licensing document by the Executive Secretary. The licensee is subject to applicable portions of these rules as well as limitations specified in the licensing document.

R313-19-25. Prelicensing Inspection.

The Executive Secretary may verify information contained in applications and secure additional information deemed necessary to make a reasonable determination as to whether to issue a license and whether special conditions should be attached thereto by visiting the facility or location where radioactive materials would be possessed or used, and by discussing details of the proposed possession or use of the radioactive materials with the applicant or representatives designated by the applicant. Such visits may be made by representatives of the Board or the Executive Secretary.

R313-19-30. Reciprocal Recognition of Licenses.

(1) Subject to these rules, a person who holds a specific license from the U.S. Nuclear Regulatory Commission, an Agreement State, or Licensing State, and issued by the agency having jurisdiction where the licensee maintains an office for directing the licensed activity and at which radiation safety records are normally maintained, is hereby granted a general license to conduct the activities authorized in the licensing document within this state for a period not in excess of 180 days in a calendar year provided that:

(a) the licensing document does not limit the activity authorized by the document to specified installations or locations;

(b) the out-of-state licensee notifies the Executive Secretary in writing at least three days prior to engaging in such activity. Notifications shall indicate the location, period, and type of proposed possession and use within the state, and shall be accompanied by a copy of the pertinent licensing document. If, for a specific case, the three-day period would impose an undue hardship on the out-of-state licensee, the licensee may, upon application to the Executive Secretary, obtain permission to proceed sooner. The Executive Secretary may waive the requirement for filing additional written notifications during the remainder of the calendar year following the receipt of the initial notification from a person engaging in activities under the general license provided in R313-19-30(1);

(c) the out-of-state licensee complies with all applicable rules of the Board and with the terms and conditions of the licensing document, except those terms and conditions which may be inconsistent with applicable rules of the Board;

(d) the out-of-state licensee supplies other information as the Executive Secretary may request; and

(e) the out-of-state licensee shall not transfer or dispose of radioactive material possessed or used under the general license provided in R313-19-30(1) except by transfer to a person:

(i) specifically licensed by the Executive Secretary or by the U.S. Nuclear Regulatory Commission, a Licensing State, or an Agreement State to receive the material, or

(ii) exempt from the requirements for a license for material under R313-19-13(2)(a).

(2) Notwithstanding the provisions of R313-19-30(1), a person who holds a specific license issued by the U.S. Nuclear Regulatory Commission, a Licensing State, or an Agreement State authorizing the holder to manufacture, transfer, install, or service a device described in R313-21-22(4) within the areas subject to the jurisdiction of the licensing body is hereby granted a general license to install, transfer, demonstrate, or service a device in this state provided that:

(a) the person shall file a report with the Executive Secretary within

thirty days after the end of a calendar quarter in which a device is transferred to or installed in this state. Reports shall identify each general licensee to whom a device is transferred by name and address, the type of device transferred, and the quantity and type of radioactive material contained in the device;

(b) the device has been manufactured, labeled, installed, and serviced in accordance with applicable provisions of the specific license issued to the person by the. Nuclear Regulatory Commission, a Licensing State, or an Agreement State;

(c) the person shall assure that any labels required to be affixed to the device under rules of the authority which licensed manufacture of the device bear a statement that "Removal of this label is prohibited"; and

(d) the holder of the specific license shall furnish to the general licensee to whom the device is transferred or on whose premises a device is installed a copy of the general license contained in R313-21-22(4) or in equivalent rules of the agency having jurisdiction over the manufacture and distribution of the device.

(3) The Executive Secretary may withdraw, limit, or qualify his acceptance of a specific license or equivalent licensing document issued by the U.S. Nuclear Regulatory Commission, a Licensing State or an Agreement State, or a product distributed pursuant to the licensing document, upon determining that the action is necessary in order to prevent undue hazard to public health and safety or property.

R313-19-34. Terms and Conditions of Licenses.

(1) Licenses issued pursuant to R313-19 shall be subject to provisions of the Act, now or hereafter in effect, and to all rules, and orders of the Executive Secretary.

(2) Licenses issued or granted under R313-21 and R313-22 and rights to possess or utilize radioactive material granted by a license issued pursuant to R313-21 and R313-22 shall not be transferred, assigned, or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through transfer of control of a license to a person unless the Executive Secretary shall, after securing full information find that the transfer is in accordance with the provisions of the Act now or hereafter in effect, and to all rules, and orders of the Executive Secretary, and shall give his consent in writing.

(3) Persons licensed by the Executive Secretary pursuant to R313-21 and R313-22 shall confine use and possession of the material licensed to the locations and purposes authorized in the license.

(4) Licensees shall notify the Executive Secretary in writing and request termination of the license when the licensee decides to terminate activities involving materials authorized under the license.

(5) Licensees shall notify the Executive Secretary in writing immediately following the filing of a voluntary or involuntary petition for bankruptcy under any Chapter of Title 11, Bankruptcy, of the United States Code by or against:

(a) the licensee;

(b) an entity, as that term is defined in 11 U.S.C.101(14), controlling the licensee or listing the license or licensee as property of the estate; or

(c) an affiliate, as that term is defined in 11 U.S.C.101(2), of the licensee.

(6) The notification specified in R313-19-34(5) shall indicate:

(a) the bankruptcy court in which the petition for bankruptcy was filed; and

(b) the date of the filing of the petition.

(7) Licensees required to submit emergency plans pursuant to R313-22-32(8) shall follow the emergency plan approved by the Executive Secretary. The licensee may change the approved plan without the Executive Secretary's approval only if the changes do not decrease the effectiveness of the plan. The licensee shall furnish the change to the Executive Secretary and to affected offsite response organizations within six months after the change is made. Proposed changes that decrease, or potentially decrease, the effectiveness of the approved emergency plan may not be implemented without prior application to and prior approval by the Executive Secretary.

R313-19-41. Transfer of Material.

(1) Licensees shall not transfer radioactive material except as authorized pursuant to R313-19-41.

(2) Except as otherwise provided in the license and subject to the provisions of R313-19-41(3) and (4), licensees may transfer radioactive material:

(a) to the Executive Secretary, if prior approval from the Executive Secretary has been received;

(b) to the U.S. Department of Energy;

(c) to persons exempt from the rules in R313-19 to the extent permitted under the exemption;

(d) to persons authorized to receive the material under terms of a general license or its equivalent, or a specific license or equivalent licensing document, issued by the Executive Secretary, the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State, or to a person otherwise authorized to receive the material by the federal government or an agency thereof, the Executive Secretary, an Agreement State or a Licensing State; or

(e) as otherwise authorized by the Executive Secretary in writing.

(3) Before transferring radioactive material to a specific licensee of the Executive Secretary, the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State, or to a general licensee who is required to register with the Executive Secretary, the U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State prior to receipt of the radioactive material, the licensee transferring the material shall verify that the transferee's license authorizes the receipt of the type, form, and quantity of radioactive material to be transferred.

(4) The following methods for the verification required by R313-19-41(3) are acceptable:

(a) the transferor may possess, and read a current copy of the transferee's specific license or registration certificate;

(b) the transferor may possess a written certification by the transferee that the transferee is authorized by license or registration certificate to receive the type, form, and quantity of radioactive material to be transferred, specifying the license or registration certificate number, issuing agency, and expiration date;

(c) for emergency shipments, the transferor may accept oral certification by the transferee that the transferee is authorized by license or registration certificate to receive the type, form, and quantity of radioactive material to be transferred, specifying the license or registration certificate number, issuing agency, and expiration date, provided that the oral certification is confirmed in writing within ten days;

(d) the transferor may obtain other information compiled by a reporting service from official records of the Executive Secretary, the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State regarding the identity of licensees and the scope and expiration dates of licenses and registration; or

(e) when none of the methods of verification described in R313-19-41(4) are readily available or when a transferor desires to verify that information received by one of the methods is correct or up-to-date, the transferor may obtain and record confirmation from the Executive Secretary, the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State that the transferee is licensed to receive the radioactive material.

(5) Shipment and transport of radioactive material shall be in accordance with the provisions of R313-19-100.

R313-19-50. Reporting Requirements.

(1) Licensees shall notify the Executive Secretary as soon as possible but not later than four hours after the discovery of an event that prevents immediate protective actions necessary to avoid exposures to radiation or radioactive materials that could exceed regulatory limits or releases of licensed material that could exceed regulatory limits. Events may include fires, explosions, toxic gas releases, etc.

(2) The following events involving licensed material require notification of the Executive Secretary by the licensee within 24 hours:

(a) an unplanned contamination event that:

(i) requires access to the contamination area, by workers or the public,

to be restricted for more than 24 hours by imposing additional radiological controls or by prohibiting entry into the area;

(ii) involves a quantity of material greater than five times the lowest annual limit on intake specified in Appendix B of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference, for the material; and

(iii) has access to the area restricted for a reason other than to allow radionuclides with a half-life of less than 24 hours to decay prior to decontamination; or

(b) an event in which equipment is disabled or fails to function as designed when:

(i) the equipment is required by rule or license condition to prevent releases exceeding regulatory limits, to prevent exposures to radiation and radioactive materials exceeding regulatory limits, or to mitigate the consequences of an accident;

(ii) the equipment is required by rule or license condition to be available and operable; and

(iii) no redundant equipment is available and operable to perform the required safety function; or

(c) an event that requires unplanned medical treatment at a medical facility of an individual with spreadable radioactive contamination on the individual's clothing or body; or

(d) an unplanned fire or explosion damaging licensed material or a device, container, or equipment containing licensed material when:

(i) the quantity of material involved is greater than five times the lowest annual limit on intake specified in Appendix B of 10 CFR 20.1001 to 20.2402, 1993 ed., which is incorporated by reference, for the material; and

(ii) the damage affects the integrity of the licensed material or its container.

(3) Preparation and submission of reports. Reports made by licensees in response to the requirements of R313-19-50 must be made as follows:

(a) licensees shall make reports required by R313-19-50(1) and (2) by telephone to the Executive Secretary. To the extent that the information is available at the time of notification, the information provided in these reports must include:

(i) the caller's name and call back telephone number;

(ii) a description of the event, including date and time;

(iii) the exact location of the event;

(iv) the radionuclides, quantities, and chemical and physical form of the licensed material involved; and

(v) available personnel radiation exposure data.

(b) Written report. A licensee who makes a report required by R313-19-50(1) or (2) shall submit a written follow-up report within 30 days of the initial report. Written reports prepared pursuant to other rules may be submitted to fulfill this requirement if the reports contain all of the necessary information and the appropriate distribution is made. These written reports shall be sent to the Executive Secretary. The report shall include the following:

(i) A description of the event, including the probable cause and the manufacturer and model number, if applicable, of equipment that failed or malfunctioned;

(ii) the exact location of the event;

(iii) the radionuclides, quantities, and chemical and physical form of the licensed material involved;

(iv) date and time of the event;

(v) corrective actions taken or planned and results of evaluations or assessments; and

(vi) the extent of exposure of individuals to radiation or radioactive materials without identification of individuals by name.

R313-19-61. Modification, Revocation and Termination of Licenses.

(1) The terms and conditions of all licenses shall be subject to amendment, revision, or modification or the license may be suspended or revoked by reason of amendments to the Act, or by reason of rules, and orders issued by the Executive Secretary.

(2) Licenses may be revoked, suspended, or modified, in whole or in part, for any material false statement in the application or any statement of fact required under provisions of the Act, or because of conditions revealed by the application or statement of fact or any report, record, or inspection or other means which would warrant the Executive Secretary to refuse to grant a license on an original application, or for violation of, or failure to observe any of the terms and conditions of the Act, or of the license, or of any rule, or order of the Executive Secretary.

(3) Administrative reviews, modifications, revocations or terminations of licenses will be in accordance with Chapter 19-3.

(4) The Executive Secretary may terminate a specific license upon written request submitted by the licensee to the Executive Secretary.

R313-19-70. Exempt Concentrations of Radioactive Materials.

Refer to R313-19-13(2)(a)

TABLE

Element (Atomic Number)	Radionuclide	Column I Concentration Material Normally Used As Gas (uCi/ml)	Column II Concentration Liquid (uCi/ml) Solid (uCi/g)
Antimony (51)	Sb-122		3 E-4
	Sb-124		2 E-4
	Sb-125		1 E-3
Argon (18)	Ar-37	1 E-3	
	Ar-41	4 E-7	
Arsenic (33)	As-73		5 E-3
	As-74		5 E-4
	As-76		2 E-4
	As-77		8 E-4
Barium (56)	Ba-131		2 E-3
	Ba-140		3 E-4
Beryllium (4)	Be-7		2 E-2
Bismuth (83)	Bi-206		4 E-4
Bromine (35)	Br-82	4 E-7	3 E-3
Cadmium (48)	Cd-109		2 E-3
	Cd-115m		3 E-4
	Cd-115		3 E-4
Calcium (20)	Ca-45		9 E-5
	Ca-47		5 E-4
Carbon (6)	C-14	1 E-6	8 E-3
Cerium (58)	Ce-141		9 E-4
	Ce-143		4 E-4
	Ce-144		1 E-4
Cesium (55)	Cs-131		2 E-2
	Cs-134m		6 E-2
	Cs-134		9 E-5
Chlorine (17)	Cl-38	9 E-7	4 E-3
Chromium (24)	Cr-51		2 E-2
Cobalt (27)	Co-57		5 E-3
	Co-58		1 E-3
	Co-60		5 E-4
Copper (29)	Cu-64		3 E-3
Dysprosium (66)	Dy-165		4 E-3
	Dy-166		4 E-4
Erbium (68)	Er-169		9 E-4
	Er-171		1 E-3
Europium (63)	Eu-152 (T = 9.2 h)		6 E-4
	Eu-155		2 E-3
Fluorine (9)	F-18	2 E-6	8 E-3
Gadolinium (64)	Gd-153		2 E-3

	Gd-159		8 E-4
Gallium (31)	Ga-72		4 E-4
Germanium (32)	Ge-71		2 E-2
Gold (79)	Au-196		2 E-3
	Au-198		5 E-4
	Au-199		2 E-3
Hafnium (72)	Hf-181		7 E-4
Hydrogen (1)	H-3	5 E-6	3 E-2
Indium (49)	In-113m		1 E-2
	In-114m		2 E-4
Iodine (53)	I-126	3 E-9	2 E-5
	I-131	3 E-9	2 E-5
	I-132	8 E-8	6 E-4
	I-133	1 E-8	7 E-5
	I-134	2 E-7	1 E-3
Iridium (77)	Ir-190		2 E-3
	Ir-192		4 E-4
	Ir-194		3 E-4
Iron (26)	Fe-55		8 E-3
	Fe-59		6 E-4
Krypton (36)	Kr-85m	1 E-6	
	Kr-85	3 E-6	
Lanthanum (57)	La-140		2 E-4
Lead (82)	Pb-203		4 E-3
Lutetium (71)	Lu-177		1 E-3
Manganese (25)	Mn-52		3 E-4
	Mn-54		1 E-3
	Mn-56		1 E-3
Mercury (80)	Hg-197m		2 E-3
	Hg-197		3 E-3
	Hg-203		2 E-4
Molybdenum (42)	Mo-99		2 E-3
Neodymium (60)	Nd-147		6 E-4
	Nd-149		3 E-3
Nickel (28)	Ni-65		1 E-3
Niobium (Columbium) (41)	Nb-95		1 E-3
	Nb-97		9 E-3
Osmium (76)	Os-185		7 E-4
	Os-191m		3 E-2
	Os-191		2 E-3
	Os-193		6 E-4
Palladium (46)	Pd-103		3 E-3
	Pd-109		9 E-4
Phosphorus (15)	P-32		2 E-4
Platinum (78)	Pt-191		1 E-3
	Pt-193m		1 E-2
	Pt-197m		1 E-2
	Pt-197		1 E-3
Potassium (19)	K-42		3 E-3
Praseodymium (59)	Pr-142		3 E-4
	Pr-143		5 E-4
Promethium (61)	Pm-147		2 E-3
	Pm-149		4 E-3
Rhenium (75)	Re-183		6 E-4
	Re-186		9 E-3
	Re-188		6 E-4
Rhodium (45)	Rh-103m		1 E-1
	Rh-105		1 E-3
Rubidium (37)	Rb-86		7 E-4
Ruthenium (44)	Ru-97		4 E-4
	Ru-103		8 E-4
	Ru-105		1 E-3
	Ru-106		1 E-4
Samarium (62)	Sm-153		8 E-4

Scandium (21)	Sc-46		4 E-4
	Sc-47		9 E-4
	Sc-48		3 E-4
Selenium (34)	Se-75		3 E-3
Silicon (14)	Si-31		9 E-3
Silver (47)	Ag-105		1 E-3
	Ag-110m		3 E-4
	Ag-111		4 E-4
Sodium (11)	Na-24		2 E-3
Strontium (38)	Sr-85		1 E-4
	Sr-89		1 E-4
	Sr-91		7 E-4
	Sr-92		7 E-4
Sulfur (16)	S-35	9 E-8	6 E-4
Tantalum (73)	Ta-182		4 E-4
Technetium (43)	Tc-96m		1 E-1
	Tc-96		1 E-3
Tellurium (52)	Te-125m		2 E-3
	Te-127m		6 E-4
	Te-127		3 E-3
	Te-129m		3 E-4
	Te-131m		6 E-4
	Te-132		3 E-4
Terbium (65)	Tb-160		4 E-4
Thallium (81)	Tl-200		4 E-3
	Tl-201		3 E-3
	Tl-202		1 E-3
	Tl-204		1 E-3
Thulium (69)	Tm-170		5 E-4
	Tm-171		5 E-3
Tin (50)	Sn-113		9 E-4
	Sn-125		2 E-4
Tungsten	W-181		4 E-3
(Wolfram)(74)	W-187		7 E-4
Vanadium (23)	V-48		3 E-4
Xenon (54)	Xe-131m	4 E-6	
	Xe-133	3 E-6	
	Xe-135	1 E-6	
Ytterbium (70)	Yb-175		1 E-3
Yttrium (39)	Y-90		2 E-4
	Y-91m		3 E-2
	Y-91		3 E-4
	Y-92		6 E-4
	Y-93		3 E-4
Zinc (30)	Zn-65		1 E-3
	Zn-69m		7 E-4
	Zn-69		2 E-2
Zirconium (40)	Zr-95		6 E-4
	Zr-97		2 E-4
Beta or gamma emitting radioactive material not listed above with half-life less than 3 years		1 E-10	1 E-6

(1) In expressing the concentrations in R313-19-70, the activity stated is that of the parent radionuclide and takes into account the radioactive decay products, because many radionuclides disintegrate into radionuclides which are also radioactive.

(2) For purposes of R313-19-13(2)(a) where there is involved a combination of radionuclides, the limit for the combination should be derived as follows: Determine for each radionuclide in the product the ratio between the

radioactivity concentration present in the product and the exempt radioactivity concentration established in R313-19-70 for the specific radionuclide when not in combination. The sum of the ratios may not exceed one or unity.

(3) To convert microcuries (uCi) to SI units of kilobecquerels (kBq), multiply the above values by 37.

R313-19-71. Exempt Quantities of Radioactive Materials.

Refer to R313-19-13(2)(b)

TABLE

RADIOACTIVE MATERIAL	MICROCURIES
Antimony-122 (Sb-122)	100
Antimony-124 (Sb-124)	10
Antimony-125 (Sb-125)	10
Arsenic-73 (As-73)	100
Arsenic-74 (As-74)	10
Arsenic-76 (As-76)	10
Arsenic-77 (As-77)	100
Barium-131 (Ba-131)	10
Barium-133 (Ba-133)	10
Barium-140 (Ba-140)	10
Bismuth-210 (Bi-210)	1
Bromine-82 (Br-82)	10
Cadmium-109 (Cd-109)	10
Cadmium-115m (Cd-115m)	10
Cadmium-115 (Cd-115)	100
Calcium-45 (Ca-45)	10
Calcium-47 (Ca-47)	10
Carbon-14 (C-14)	100
Cerium-141 (Ce-141)	100
Cerium-143 (Ce-143)	100
Cerium-144 (Ce-144)	1
Cesium-129 (Cs-129)	100
Cesium-131 (Cs-131)	1,000
Cesium-134m (Cs-134m)	100
Cesium-134 (Cs-134)	1
Cesium-135 (Cs-135)	10
Cesium-136 (Cs-136)	10
Cesium-137 (Cs-137)	10
Chlorine-36 (Cl-36)	10
Chlorine-38 (Cl-38)	10
Chromium-51 (Cr-51)	1,000
Cobalt-57 (Co-57)	100
Cobalt-58m (Co-58m)	10
Cobalt-58 (Co-58)	10
Cobalt-60 (Co-60)	1
Copper-64 (Cu-64)	100
Dysprosium-165 (Dy-165)	10
Dysprosium-166 (Dy-166)	100
Erbium-169 (Er-169)	100
Erbium-171 (Er-171)	100
Europium-152 (Eu-152) 9.2h	100
Europium-152 (Eu-152) 13 yr	1
Europium-154 (Eu-154)	1
Europium-155 (Eu-155)	10
Fluroine-18 (F-18)	1,000
Gadolinium-153 (Gd-153)	10
Gadolinium-159 (Gd-159)	100
Gallium-67 (Ga-67)	100
Gallium-72 (Ga-72)	10
Germanium-68 (Ge-68)	10
Germanium-71 (Ge-71)	100

Gold-195 (Au 195)	10
Gold-198 (Au-198)	100
Gold-199 (Au-199)	100
Hafnium-181 (Hf-181)	10
Holmium-166 (Ho-166)	100
Hydrogen-3 (H-3)	1,000
Indium-111 (In-111)	100
Indium-113m (In-113m)	100
Indium-114m (In-114m)	10
Indium-115m (In-115m)	100
Indium-115 (In-115)	10
Iodine-123 (I-123)	100
Iodine-125 (I-125)	1
Iodine-126 (I-126)	1
Iodine-129 (I-129)	0.1
Iodine-131 (I-131)	1
Iodine-132 (I-132)	10
Iodine-133 (I-133)	1
Iodine-134 (I-134)	10
Iodine-135 (I-135)	10
Iridium-192 (Ir-192)	10
Iridium-194 (Ir-194)	100
Iron-52 (Fe-52)	10
Iron-55 (Fe-55)	100
Iron-59 (Fe-59)	10
Krypton-85 (Kr-85)	100
Krypton-87 (Kr-87)	10
Lanthanum-140 (La-140)	10
Lutetium-177 (Lu-177)	100
Manganese-52 (Mn-52)	10
Manganese-54 (Mn-54)	10
Manganese-56 (Mn-56)	10
Mercury-197m (Hg-197m)	100
Mercury-197 (Hg-197)	100
Mercury-203 (Hg-203)	10
Molybdenum-99 (Mo-99)	100
Neodymium-147 (Nd-147)	100
Neodymium-149 (Nd-149)	100
Nickel-59 (Ni-59)	100
Nickel-63 (Ni-63)	10
Nickel-65 (Ni-65)	100
Niobium-93m (Nb-93m)	10
Niobium-95 (Nb-95)	10
Niobium-97 (Nb-97)	10
Osmium-185 (Os-185)	10
Osmium-191m (Os-191m)	100
Osmium-191 (Os-191)	100
Osmium-193 (Os-193)	100
Palladium-103 (Pd-103)	100
Palladium-109 (Pd-109)	100
Phosphorus-32 (P-32)	10
Platinum-191 (Pt-191)	100
Platinum-193m (Pt-193m)	100
Platinum-193 (Pt-193)	100
Platinum-197m (Pt-197m)	100
Platinum-197 (Pt-197)	100
Polonium-210 (Po-210)	0.1
Potassium-42 (K-42)	10
Potassium-43 (K-43)	10
Praseodymium-142 (Pr-142)	100
Praseodymium-143 (Pr-143)	100
Promethium-147 (Pm-147)	10
Promethium-149 (Pm-149)	10
Rhenium-186 (Re-186)	100

Rhenium-188 (Re-188)	100
Rhodium-103m (Rh-103m)	100
Rhodium-105 (Rh-105)	100
Rubidium-81 (Rb-81)	10
Rubidium-86 (Rb-86)	10
Rubidium-87 (Rb-87)	10
Ruthenium-97 (Ru-97)	100
Ruthenium-103 (Ru-103)	10
Ruthenium-105 (Ru-105)	10
Ruthenium-106 (Ru-106)	1
Samarium-151 (Sm-151)	10
Samarium-153 (Sm-153)	100
Scandium-46 (Sc-46)	10
Scandium-47 (Sc-47)	100
Scandium-48 (Sc-48)	10
Selenium-75 (Se-75)	10
Silicon-31 (Si-31)	100
Silver-105 (Ag-105)	10
Silver-110m (Ag-110m)	1
Silver-111 (Ag-111)	100
Sodium-22 (Na-22)	10
Sodium-24 (Na-24)	10
Strontium-85 (Sr-85)	10
Strontium-89 (Sr-89)	1
Strontium-90 (Sr-90)	0.1
Strontium-91 (Sr-91)	10
Strontium-92 (Sr-92)	10
Sulfur-35 (S-35)	100
Tantalum-182 (Ta-182)	10
Technetium-96 (Tc-96)	10
Technetium-97m (Tc-97m)	100
Technetium-97 (Tc-97)	100
Technetium-99m (Tc-99m)	100
Technetium-99 (Tc-99)	10
Tellurium-125m (Te-125m)	10
Tellurium-127m (Te-127m)	10
Tellurium-127 (Te-127)	100
Tellurium-129m (Te-129m)	10
Tellurium-129 (Te-129)	100
Tellurium 131m (Te-131m)	10
Tellurium-132 (Te-132)	10
Terbium-160 (Tb-160)	10
Thallium-200 (Tl-200)	100
Thallium-201 (Tl-201)	100
Thallium-202 (Tl-202)	100
Thallium-204 (Tl-204)	10
Thulium-170 (Tm-170)	10
Thulium-171 (Tm-171)	10
Tin-113 (Sn-113)	10
Tin-125 (Sn-125)	10
Tungsten-181 (W-181)	10
Tungsten-185 (W-185)	10
Tungsten-187 (W-187)	100
Vanadium-48 (V-48)	10
Xenon-131m (Xe-131m)	1,000
Xenon-133 (Xe-133)	100
Xenon-135 (Xe-135)	100
Ytterbium-175 (Yb-175)	100
Yttrium-87 (Y-87)	10
Yttrium-88 (Y-88)	10
Yttrium-90 (Y-90)	10
Yttrium-91 (Y-91)	10
Yttrium-92 (Y-92)	100
Yttrium-93 (Y-93)	100

Zinc-65 (Zn-65)	10
Zinc-69m (Zn-69m)	100
Zinc-69 (Zn-69)	1,000
Zirconium-93 (Zr-93)	10
Zirconium-95 (Zr-95)	10
Zirconium-97 (Zr-97)	10
Any radioactive material not listed above other than alpha emitting radioactive material.	0.1

(1) To convert microcuries (uCi) to SI units of kilobecquerels (kBq), multiply the above values by 37.

R313-19-100. Transportation.

(1) A person shall not transport radioactive material or deliver radioactive material to a carrier for transport except as authorized in a general or specific license issued by the Executive Secretary or as exempted in R313-19-100(2).

(2) Exemptions.

(a) Common and contract carriers, freight forwarders, and warehousemen who are subject to the requirements of the U.S. Department of Transportation in 49 CFR 170 through 189 or the U.S. Postal Service in the Postal Service Manual (Domestic Mail Manual), Section 124-3, which the U.S. Postal Service has incorporated by reference at 39 CFR 111.1, 1992, ed., and the U.S. Postal Service are exempt from the requirements of R313-19-100 to the extent that they transport or store radioactive material in the regular course of their carriage for others or storage incident thereto. Common and contract carriers who are not subject to the requirements of the U.S. Department of Transportation (DOT) or U.S. Postal Service are subject to R313-19-100(1) and other applicable requirements of these rules.

(b) Licensees are exempt from R313-19-100 to the extent that deliver the licensee delivers to a carrier for transport a package containing radioactive material having a specific activity not greater than 0.002 microcurie per gram (74.0 Bq/g).

(c) With the exception of R313-19-100(3) and R313-19-100(14), a licensee is exempt from all requirements of R313-19-100, with respect to shipment or carriage of the following:

(i) a package containing no more than a Type A quantity of radioactive material if the package contains no fissile material; or

(ii) packages transported between locations within the United States which contain only americium or plutonium in special form with an aggregate radioactivity not to exceed 20 curies (740 GBq).

(3) Transportation of Licensed Material.

(a) A licensee who transports licensed material outside of the confines of the licensee's plant or other place of use, or who delivers licensed material to a carrier for transport shall:

(i) comply with the applicable requirements, appropriate to the mode of transport, of the regulations of the DOT; and

(ii) assure that any special instructions needed to safely open the package are sent to or have been made available to the consignee.

(b) If, for any reason the regulations of the DOT are not applicable to a shipment of licensed material, the licensee shall conform to the standards and requirements of those regulations to the same extent as if the shipment was subject to the regulations.

(4) General licenses for carriers.

(a) A general license is hereby issued to a common or contract carrier not exempt under R313-19-100(2) to receive, possess, transport, and store radioactive material in the regular course of their carriage for others or storage incident thereto, provided the transportation and storage is in accordance with the applicable requirements, appropriate to the mode of transport, of the U.S. Department of Transportation insofar as the requirements relate to the loading and storage of packages, placarding of the transporting vehicle, and incident

reporting. Notification of incidents referred to in those requirements shall be filed with, or made to, the Executive Secretary.

(b) A general license is hereby issued to a private carrier to transport radioactive material, provided the transportation is in accordance with the applicable requirements, appropriate to the mode of transport, of the U.S. Department of Transportation insofar as such requirements relate to the loading and storage of packages, placarding of the transporting vehicle, and incident reporting. Notification of incidents referred to in those requirements shall be filed with, or made to, the Executive Secretary.

(c) Persons who transport radioactive material pursuant to the general licenses in R313-19-100(3)(a) or (b) are exempt from the requirements of R313-15 and R313-18 to the extent that they transport radioactive material.

(5) General License - Approved Packages.

(a) A general license is hereby issued to any person licensed by the Executive Secretary to transport, or to deliver to a carrier for transport, licensed material in a package for which a license, certificate of compliance, or other approval has been issued by the U.S. Nuclear Regulatory Commission (NRC).

(b) This general license applies only to a licensee who:

(i) has a copy of the specific license, certificate of compliance, or other approval of the package and has the drawings and other documents referenced in the approval relating to the use and maintenance of the packaging and to the actions to be taken prior to shipment;

(ii) complies with the terms and conditions of the license, certificate, or other approval, as applicable, and the applicable requirements of R313-19-100;

(iii) prior to the licensee's first use of the package, has registered with the NRC; and

(iv) has a quality assurance program that meets the requirements of R313-19-100(18).

(c) The general license in R313-19-100(5)(a) applies only when the package approval authorizes use of the package under this general license.

(d) For previously approved Type B packages which are not designated as either B(U) or B(M) in the Certificate of Compliance, this general license is subject to additional restrictions of R313-19-100(6).

(6) General License - Previously Approved Type B Packages.

(a) A Type B package previously approved by the NRC, but not designated as B(U) or B(M) in the Certificate of Compliance, may be used under the general license of R313-19-100(5) with the following additional limitations:

(i) fabrication of the packaging was satisfactorily completed before August 31, 1986, as demonstrated by application of its model number in accordance with NRC regulations; and

(ii) the package may not be used for a shipment to a location outside the United States, except approved under special arrangement in accordance with 49 CFR 173.471.

(7) General License - Specification Container.

(a) A general license is issued to any person licensed by the Executive Secretary to transport, or to deliver to a carrier for transport, licensed material in a specification container for a Type B quantity of radioactive material as specified in 49 CFR 173 and 178.

(b) This general license applies only to a licensee who has a quality assurance program required by R313-19-100(18).

(c) This general license applies only to a licensee who:

(i) has a copy of the specification; and

(ii) complies with the terms and conditions of the specification and the applicable requirements of R313-19-100.

(d) The general license in R313-19-100(7)(a) is subject to the limitation that the specification container may not be used for a shipment to a location outside the United States except approved under special arrangements in accordance with 49 CFR 173.472.

(8) General License - Use of Foreign Approved Package.

(a) A general license is issued to any person licensed by the Executive Secretary to transport, or to deliver to a carrier for transport, licensed material in a package the design of which has been approved in a foreign national competent authority certificate which has been revalidated by the DOT as meeting

the applicable requirements of 49 CFR 171.12.

(b) This general license applies only to international shipments.

(c) This general license applies only to a licensee who:

(i) has a copy of the applicable certificate, the revalidation, and the drawings and other documents referenced in the certificate relating to the use and maintenance of the packaging and to the actions to be taken prior to shipment; and

(ii) complies with the terms and conditions of the certificate and revalidation and with the applicable requirements of this part.

(9) General License - Type A, Fissile Class II Package.

(a) A general license is hereby issued to any licensee to transport fissile material, or to deliver fissile material to a carrier for transport, if the material is shipped as a Fissile Class II package.

(b) This general license applies only when a package contains no more than a Type A quantity of radioactive material, including only one of the following:

(i) up to 40 grams of uranium-235;

(ii) up to 30 grams of uranium-233;

(iii) up to 25 grams of the fissile radionuclides of plutonium, except that for encapsulated plutonium-beryllium neutron sources in special form, an A_1 quantity of plutonium may be present; or

(iv) a combination of fissile radionuclides in which the sum of the ratios of the amount of each radionuclide to the corresponding maximum amounts in R313-19-100(9)(b)(i), (ii) and (iii) does not exceed unity.

(c)(i) Except as specified in R313-19-100(9)(c)(ii), this general license applies only when a package containing more than 15 grams of fissile radionuclides is labeled with a transport index not less than the number given by the following equation:

Minimum Transport Index equals $(0.4x + 0.67y + z)\ (1- (15/(x + y + z)))$ where the package contains x grams of uranium-235, y grams of uranium-233, and z grams of the fissile radionuclides of plutonium.

(ii) For a package in which the only fissile material is in the form of encapsulated plutonium-beryllium neutron sources in special form, the transport index based on criticality considerations may be taken as 0.026 times the number of grams of the fissile radionuclides of plutonium in excess of 15 grams.

(iii) In all cases, the transport index shall be rounded up to one decimal place and may not exceed 10.0.

(10) General License - Restricted, Fissile Class II Package.

(a) A general license is hereby issued to any licensee to transport fissile material, or to deliver fissile material to a carrier for transport, if the material is shipped as a Fissile Class II package.

(b) This general license applies only when all of the following requirements are met.

(i) The package contains no more than a Type A quantity of radioactive material.

(ii) Neither beryllium nor hydrogenous material enriched in deuterium is present.

(iii) The total mass of graphite present does not exceed 150 times the total mass of uranium-235 plus plutonium.

(iv) Substances having a higher hydrogen density than water are not present, except that polyethylene may be used for packing or wrapping.

(v) Uranium-233 is not present, and the amount of plutonium does not exceed one percent of the amount of uranium-235.

(vi) The amount of uranium-235 is limited as follows:

(A) If the fissile radionuclides are not uniformly distributed, the maximum amount of uranium-235 per package may not exceed the value given in the following table:

TABLE 1

Uranium enrichment in weight percent of uranium-235 not exceeding	Permissible maximum grams of uranium-235 per package
24	40
20	42

15	45
11	48
10	51
9.5	52
9	54
8.5	55
8	57
7.5	59
7	60
6.5	62
6	65
5.5	68
5	72
4.5	76
4	80
3.5	88
3	100
2.5	120
2	164
1.5	272
1.35	320
1	680(1)
0.92	1200(1)

(1) Pursuant to Section 19-3-113 which refers to the Department's agreement with the NRC, jurisdiction extends only to 350 grams of uranium-235.

(B) If the fissile radionuclides are distributed uniformly, the maximum amount of uranium-235 per package may not exceed the value given in the following table:

TABLE 2

Uranium enrichment in weight percent of uranium-235 not exceeding	Permissible maximum grams of uranium-235 per package
4	84
3.5	92
3	112
2.5	148
2	240
1.5	560(1)
1.35	800(1)

(1) Pursuant to Section 19-3-113 which refers to the Department's agreement with the NRC, jurisdiction extends only to 350 grams of uranium-235.

(vii) The transport index of each package based on criticality considerations is taken as ten times the number of grams of uranium-235 in the package divided by the maximum allowable number of grams per package in accordance with Table 1 or 2 above as applicable.

(11) Fissile Material - Assumptions as to Unknown Properties. When the isotopic abundance, mass, concentration, degree of irradiation, degree of moderation, or other pertinent property of fissile material in any package is not known, the licensee shall package the fissile material as if the unknown properties had credible values that would cause the maximum nuclear reactivity.

(12) Preliminary Determinations. Prior to the first use of any packaging for the shipment of radioactive material:

(a) the licensee shall ascertain that there are no defects which could significantly reduce the effectiveness of the packaging;

(b) where the maximum normal operating pressure will exceed 34.3 kilopascal (5 psi), the licensee shall test the containment system at an internal pressure at least 50 percent higher than the maximum normal operating pressure to verify the capability of that system to maintain its structural integrity at

that pressure;

(c) the licensee shall determine that the packaging has been fabricated in accordance with the design approved by the NRC; and

(d) the licensee shall conspicuously and durably mark the packaging with its model number, gross weight, and a package identification number assigned by the NRC.

(13) Routine Determinations. Prior to each shipment of licensed material, the licensee shall determine that:

(a) the package is proper for the contents to be shipped;

(b) the package is in unimpaired physical condition except for superficial defects such as marks or dents;

(c) each closure device of the packaging, including any required gasket, is properly installed and secured and free of defects;

(d) any system for containing liquid is adequately sealed and has adequate space or other specified provision for expansion of the liquid;

(e) any pressure relief device is operable and set in accordance with written procedures;

(f) the package has been loaded and closed in accordance with written procedures;

(g) any structural part of the package which could be used to lift or tie down the package during transport is rendered inoperable for that purpose unless it satisfies design requirements specified by the NRC;

(h)(i) the level of removable radioactive contamination on the external surfaces of each package offered for shipment is as low as reasonably achievable. The level of removable radioactive contamination may be determined by wiping an area of 300 square centimeters of the surface concerned with an absorbent material, using moderate pressure, and measuring the activity on the wiping material. Sufficient measurements shall be taken in the most appropriate locations to yield a representative assessment of the removable contamination levels. Except as provided in R313-19-100(13)(h)(ii), the amount of radioactivity measured on any single wiping material, when averaged over the surface wiped, shall not exceed the limits given in Table 3 below at any time during transport. Other methods of assessment of equal or greater efficiency may be used. When other methods are used, the detection efficiency of the method used shall be taken into account and in no case may the removable contamination on the external surfaces of the package exceed ten times the limits listed in Table 3.

TABLE 3
Removable External Radioactive Contamination Wipe Limits

Contaminant	Maximum Permissible Limits uCi/cm^2	dpm/cm^2
Beta-gamma emitting radionuclides; all radionuclides with half-lives less than ten days; natural uranium; natural thorium; uranium-235; uranium-238; thorium-232; thorium-228 and thorium-230 when contained in ores or physical concentrates	10^{-5}	22
All other alpha emitting radionuclides	10^{-6}	2.2

To convert microcuries (uCi) to SI units of megabecquerels, multiply the values by 37.

(ii) in the case of packages transported as exclusive use shipments by rail or highway only, the removable radioactive contamination at any time during transport shall not exceed ten times the levels prescribed in R313-19-100(13)(h)(i). The levels at the beginning of transport shall not exceed the levels in R313-19-100(13)(h)(i);

(i) external radiation levels around the package and around the vehicle, if applicable, will not exceed 200 millirems per hour (2 mSv/h) at any point on

the external surface of the package at any time during transportation. The transport index shall not exceed ten;

(j) for a package transported in exclusive use by rail, highway or water, radiation levels external to the package may exceed the limits specified in R313-19-100(13)(i) but shall not exceed any of the following:

(i) 200 millirems per hour (2 mSv/h) on the accessible external surface of the package unless the following conditions are met, in which case the limit is 1000 millirems per hour (10 mSv/h);

(A) the shipment is made in a closed transport vehicle,

(B) provisions are made to secure the package so that its position within the vehicle remains fixed during transportation, and

(C) there are no loading or unloading operations between the beginning and end of the transportation;

(ii) 200 millirems per hour (2 mSv/h) at any point on the outer surface of the vehicle, including the upper and lower surfaces, or, in the case of a flat-bed style vehicle, with a personnel barrier, at any point on the vertical planes projected from the outer edges of the vehicle, on the upper surface of the load, or enclosure, if used, and on the lower external surface of the vehicle. A flat-bed style vehicle with a personnel barrier shall have radiation levels determined at vertical planes. If no personnel barrier, the package cannot exceed 200 millirems per hour (2 mSv/h) at the surface;

(iii) ten millirems per hour (0.1 mSv/h) at any point two meters from the vertical planes represented by the outer lateral surfaces of the vehicle, or, in the case of a flat-bed style vehicle, at any point two meters from the vertical planes projected from the outer edges of the vehicle; and

(iv) two millirems per hour (0.02 mSv/h) in any normally occupied positions of the vehicle, except that this provision does not apply to private motor carriers when persons occupying these positions are provided with special health supervision, personnel radiation exposure monitoring devices, and training in accordance with R313-18-12; and

(k) a package shall be prepared for transport so that in still air at 100 degrees Fahrenheit (38 degrees Celsius) and in the shade, no accessible surface of a package would have a temperature exceeding 122 degrees Fahrenheit (50 degrees Celsius) in a nonexclusive use shipment or 180 degrees Fahrenheit (82 degrees Celsius) in an exclusive use shipment. Accessible package surface temperatures shall not exceed these limits at any time during transportation.

(14) Air Transport of Plutonium. Notwithstanding the provisions of any general licenses and notwithstanding any exemptions stated directly in R313-19-100 or included indirectly by citation of the DOT regulations, as may be applicable, the licensee shall assure that plutonium in any form is not transported by air, or delivered to a carrier for air transport, unless:

(a) the plutonium is contained in a medical device designed for individual human application;

(b) the plutonium is contained in a material in which the specific activity is not greater than 0.002 microcuries per gram (74 Bq/gm) of material and in which the radioactivity is essentially uniformly distributed;

(c) the plutonium is shipped in a single package containing no more than an A_2 quantity of plutonium in any radionuclide or form and is shipped in accordance with R313-19-100(3); or

(d) the plutonium is shipped in a package specifically authorized for the shipment of plutonium by air in the Certificate of Compliance for that package issued by the NRC.

(15) Shipment Records. Each licensee shall maintain for a period of two years after shipment a record of each shipment of licensed material not exempt under R313-19-100(2), showing, where applicable:

(a) identification of the packaging by model number;

(b) verification that there were no significant defects in the packaging, as shipped;

(c) volume and identification of coolant;

(d) type and quantity of licensed material in each package, and the total quantity of each shipment;

(e) date of the shipment;

(f) name and address of the transferee;

(g) address to which the shipment was made; and

(h) results of the determinations required by R313-19-100(13).

(16) Reports. The licensee shall report to the Executive Secretary within 30 days:

(a) any instance in which there is significant reduction in the effectiveness of any authorized packaging during use; and

(b) details of any defects with safety significance in the packaging after first use, with the means employed to repair the defects and prevent their recurrence.

(17) Advance Notification of Transport of Nuclear Waste

(a) Prior to the transport of any nuclear waste outside of the confines of the licensee's facility or other place of use or storage, or prior to the delivery of any nuclear waste to a carrier for transport, each licensee shall provide advance notification of such transport to the governor, or governor's designee, of each state through which the waste will be transported. A list of the mailing addresses of the governors and governors' designees is available upon request from the Director, State Programs, Office of Governmental and Public Affairs, NRC, Washington, D.C. 20555.

(b) Advance notification is required only when:

(i) the nuclear waste is required to be in Type B packaging for transportation;

(ii) the nuclear waste is being transported to, through, or across state boundaries to a disposal site or to a collection point for transport to a disposal site; and

(iii) the quantity of licensed material in a single package exceeds:

(A) 5,000 curies (185 TBq) of special form radionuclides;

(B) 5,000 curies (185 TBq) of uncompressed gases of argon-41, krypton-85m, krypton-87, xenon-131m, or xenon-135;

(C) 50,000 curies (1.85 PBq) of argon-37, or of uncompressed gases of krypton-85 or xenon-133, or of hydrogen-3 as a gas, as luminous paint, or absorbed on solid material;

(D) 20 curies (740 GBq) of other non-special form radionuclides for which A_2 is less than or equal to 4 curies (148 GBq); or

(E) 200 curies (7.4 TBq) of other non-special form radionuclides for which A_2 is greater than 4 curies (148 GBq).

(c) Each advance notification required by R313-19-100(17)(a) shall contain the following information:

(i) the name, address, and telephone number of the shipper, carrier, and receiver of the shipment;

(ii) a description of the nuclear waste contained in the shipment as required by 49 CFR 172.202 and 172.203(d);

(iii) the point of origin of the shipment and the seven-day period during which departure of the shipment is estimated to occur;

(iv) the seven-day period during which arrival of the shipment at state boundaries is estimated to occur;

(v) the destination of the shipment, and the seven-day period during which arrival of the shipment is estimated to occur; and

(vi) a point of contact with a telephone number for current shipment information.

(d) The notification required by R313-19-100(17)(a) shall be made in writing to the office of each appropriate governor, or governor's designee, and to the Executive Secretary. A notification delivered by mail shall be postmarked at least seven days before the beginning of the seven-day period during which departure of the shipment is estimated to occur. A notification delivered by messenger shall reach the office of the governor, or governor's designee, at least four days before the beginning of the seven-day period during which departure of the shipment is estimated to occur. A copy of the notification shall be retained by the licensee for one year.

(e) The licensee shall notify each appropriate governor, or governor's designee, and the Executive Secretary of any changes to schedule information provided pursuant to R313-19-100(17)(a). Such notification shall be by telephone to a responsible individual in the office of the governor, or governor's designee, of the appropriate state or states. The licensee shall maintain for one year a record of the name of the individual contacted.

(f) Each licensee who cancels a nuclear waste shipment, for which advance

notification has been sent, shall send a cancellation notice to the governor, or governor's designee, of each appropriate state and to the Executive Secretary. A copy of the notice shall be retained by the licensee for one year.

(18) Quality Assurance Requirements.

(a) Each licensee shall establish, maintain, and execute a quality assurance program to verify by procedures such as checking, auditing, and inspection that deficiencies, deviations, and defective material and equipment relating to the shipment of packages containing radioactive material are promptly identified and corrected.

(b) The licensee shall identify the material and components to be covered by the quality assurance program.

(c) Each licensee shall document the quality assurance program by written procedures or instructions and shall carry out the program in accordance with those procedures throughout the period during which packaging is used.

(d) The licensee shall maintain sufficient written records to demonstrate compliance with the quality assurance program. Records of quality assurance pertaining to the use of a package for shipment of radioactive material shall be maintained for a period of two years after shipment.

(19) Determination of A_1 and A_2.

(a) Single Radionuclides

(i) For a single radionuclide of known identity, the values of A_1 and A_2 are taken from Table 4 if listed there. The values A_1 and A_2 in Table 4 are also applicable for the radionuclide contained in (alpha, neutron) or (gamma, neutron) neutron sources.

(ii) For any single radionuclide whose identity is known but which is not listed in Table 4 the value of A_1 and A_2 are determined according to the following procedure:

(A) If the radionuclide emits only one type of radiation, A_1 is determined according to the following method. For radionuclides emitting different kinds of radiation, A_1 is the most restrictive value of those determined for each kind of radiation. However, in either case, A_1 is restricted to a maximum of 1000 curies (37 TBq). If a parent nuclide decays into a shorter lived daughter with a half-life not greater than ten days, A_1 is calculated for both the parent and the daughter, and the more limiting of the two values is assigned to the parent nuclide.

(I) For gamma emitters, A_1 is determined by the expression: A_1 equals (9 Curies)/G, where G is the gamma-ray constant, corresponding to the dose in roentgens per curie-hour at one meter, and the number 9 results from the choice of one rem per hour at a distance of three meters as the reference dose-equivalent rate.

(II) For x-ray emitters, A_1 is determined by the atomic number of the nuclide: for Z less than or equal to 55, A_1 equals 1000 Ci (37 TBq); and for Z greater than 55, A_1 equals 200 Ci (7.4 TBq) where Z is the atomic number of the nuclide.

(III) For beta emitters, A_1 is determined by the maximum beta energy (E_{max}) according to Table 5; and

(IV) For alpha emitters, A_1 is determined by the expression: A_1 equals 1000 A_3 where A_3 is the value listed in Table 6;

(B) A_2 is the more restrictive of the following two values:

(I) The corresponding A_1; and

(II) The value A_3 obtained from Table 6.

(iii) For any single radionuclide whose identity is unknown, the value of A_1 is taken to be two Ci (74 GBq) and the value of A_2 is taken to be 0.002 Ci (74 MBq). However, if the atomic number of the radionuclide is known to be less than 82, the value of A_1 is taken to be ten Ci (370 GBq) and the value of A_2 is taken to be 0.4 Ci (14.8 GBq).

(b) Mixtures of Radionuclides, Including Radioactive Decay Chains

(i) For mixed fission products, the activity limit may be assumed if a detailed analysis of the mixture is not carried out, A_1 equals 10 Ci (370 GBq), A_2 equals 0.4 Ci (14.8 GBq).

(ii) A single radioactive decay chain is considered to be a single radionuclide when the radionuclides are present in their naturally occurring proportions and no daughter nuclide has a half-life either longer than ten days or longer than that of the parent nuclide. The activity to be taken into account

and the A_1 or A_2 value from Table 4 to be applied are those corresponding to the parent nuclide of that chain. When calculating A_1 or A_2 values, radiation emitted by daughters shall be considered. However, in the case of radioactive decay chains in which any daughter nuclide has a half-life either longer than ten days or greater than that of the parent nuclide, the parent and daughter nuclides are considered to be mixtures of different nuclides.

(iii) In the case of a mixture of different radionuclides, where the identity and activity of each radionuclide are known, the permissible activity of each radionuclide R_1, R_2 . . . R_n is such that $F_1 + F_2 + . . . F_n$ is not greater than unity, where:

F_1 equals the total activity of $R_1/(A_i) \times (R_1)$
F_2 equals the total activity of $R_2/(A_i) \times (R_2)$
F_n equals the total activity of $R_n/(A_i) \times (R_n)$ and
A_i (R_1, R_2. .R_n) is the value of A_1 or A_2 as appropriate for the nuclide R_1, R_2. .R_n.

(iv) When the identity of each radionuclide is known but the individual activities of some of the radionuclides are not known, the formula given in R313-19-100(19)(b)(iii) is applied to establish the values of A_1 or A_2 as appropriate. All the radionuclides whose individual activities are not known (their total activity will, however, be known) are classed in a single group and the most restrictive value of A_1 and A_2 applicable to any one of them is used as the value of A_1 or A_2 in the denominator of the fraction.

(v) Where the identity of each radionuclide is known but the individual activity of none of the radionuclides is known, the most restrictive value of A_1 or A_2 applicable to any one of the radionuclides present is adopted as the applicable value.

(vi) When the identity of none of the nuclides is known, the value of A_1 is taken to be two Ci (74 GBq) and the value of A_2 is taken to be 0.002 Ci (74 MBq). However, if alpha emitters are known to be absent, the value of A_2 is taken to be 0.4 Ci (14.8 GBq).

TABLE 4
A_1 and A_2 Values for Radionuclides
(See footnotes at end of table.)

Symbol of Radionuclide	Element of Atomic Number	A_1 (Ci)	A_2 (Ci)	Specific activity (Ci/g)
227-Ac	Actinium (89)	1000	0.003	7.2E+1
228-Ac		10	4	2.2E+6
105-Ag	Silver (47)	40	40	3.1E+4
110m-Ag		7	7	4.7E+3
111-Ag		100	20	1.6E+5
241-Am	Americium (95)	8	0.008	3.2
243-Am		8	0.008	1.9E-1
37-Ar (compressed/ uncompressed)(1)	Argon (18)	1000	1000	1.0E+5
41-Ar (uncompressed)(1)		20	20	4.3E+7
41-Ar (compressed)(1)		1	1	4.3E+7
73-As	Arsenic (33)	1000	400	2.4E+4
74-As		20	20	1.0E+5
76-As		10	10	1.6E+6
77-As		300	20	1.1E+6
211-At	Astatine (85)	200	7	2.1E+6
193-Au	Gold (79)	200	200	9.3E+5
196-Au		30	30	1.2E+5
198-Au		40	20	2.5E+5
199-Au		200	25	2.1E+5
131-Ba	Barium (56)	40	40	8.7E+4
133-Ba		40	10	4.0E+2

140-Ba		20	20	7.3E+4
7-Be	Beryllium (4)	300	300	3.5E+5
206-Bi	Bismuth (83)	5	5	9.9E+4
207-Bi		10	25	2.2E+2
210-Bi (RaE)		100	4	1.2E+5
212-Bi		6	6	1.5E+7
249-Bk	Berkelium (97)	1000	1	1.8E+3
77-Br	Bromine (35)	70	25	7.1E+5
82-Br		6	6	1.1E+6
11-C	Carbon (6)	20	20	8.4E+8
14-C		1000	60	4.6
45-Ca	Calcium (20)	1000	25	1.9E+4
47-Ca		20	20	5.9E+5
109-Cd	Cadmium (48)	1000	70	2.6E+3
115m-Cd		30	30	2.6E+4
115-Cd		80	20	5.1E+5
139-Ce	Cerium (58)	100	100	6.5E+3
141-Ce		300	25	2.8E+4
143-Ce		60	20	6.6E+5
144-Ce		10	7	3.2E+3
249-Cf	Californium (98)	2	0.002	3.1
250-Cf		7	0.007	1.3E+2
252-Cf		2	0.009	6.5E+2
36-Cl	Chlorine (17)	300	10	3.2E-2
38-Cl		10	10	1.3E+8
242-Cm	Curium (96)	200	0.2	3.3E+3
243-Cm		9	0.009	4.2E+1
244-Cm		10	0.01	8.2E+1
245-Cm		6	0.006	1.0E-1
246-Cm		6	0.006	3.6E-1
56-Co	Cobalt (27)	5	5	3.0E+4
57-Co		90	90	8.5E+3
58m-Co		1000	1000	5.9E+6
58-Co		20	20	3.1E+4
60-Co		7	7	1.1E+3
51-Cr	Chromium (24)	600	600	9.2E+4
129-Cs	Cesium (55)	40	40	7.6E+5
131-Cs		1000	1000	1.0E+5
134m-Cs		1000	10	7.4E+6
134-Cs		10	10	1.2E+3
135-Cs		1000	25	8.8E-4
136-Cs		7	7	7.4E+4
137-Cs		30	10	9.8E+1
64-Cu	Copper (29)	80	25	3.8E+6
67-Cu		200	25	7.9E+5
165-Dy	Dysprosium (66)	100	20	8.2E+6
166-Dy		1000	200	2.3E+5
169-Er	Erbium (68)	1000	25	8.2E+4
171-Er		50	20	2.4E+6
152m-Eu	Europium (63)	30	30	2.2E+6
152-Eu		20	10	1.9E+2
154-Eu		10	5	1.5E+2
155-Eu		400	60	1.4E+3
18-F	Fluorine (9)	20	20	9.3E+7
52-Fe	Iron (26)	5	5	7.3E+6
55-Fe		1000	1000	2.2E+3
59-Fe		10	10	4.9E+4
67-Ga	Gallium (31)	100	100	6.0E+5
68-Ga		20	20	4.0E+7
72-Ga		7	7	3.1E+6
153-Gd	Gadolinium (64)	200	100	3.6E+3
159-Gd		300	20	1.1E+6
68-Ge	Germanium (32)	20	10	7.0E+3
71-Ge		1000	1000	1.6E+5

3-H	Hydrogen (1) see T-Tritium			
181-Hf	Hafnium (72)	30	25	1.6E+4
197m-Hg	Mercury (80)	200	200	6.6E+5
197-Hg		200	200	2.5E+5
203-Hg		80	25	1.4E+4
166-Ho	Holmium (67)	30	30	6.9E+5
123-I	Iodine (53)	50	50	1.9E+6
125-I		1000	70	1.7E+4
126-I		40	10	7.8E+4
129-I		1000	2	1.6E-4
131-I		40	10	1.2E+5
132-I		7	7	1.1E+7
133-I		30	10	1.1E+6
134-I		8	8	2.7E+7
135-I		10	10	3.5E+6
111-In	Indium (49)	30	25	4.2E+5
113m-In		60	60	1.6E+7
114m-In		30	20	2.3E+4
115m-In		100	20	6.1E+6
190-Ir	Iridium (77)	10	10	6.2E+4
192-Ir		20	10	9.1E+3
194-Ir		10	10	8.5E+5
42-K	Potassium (19)	10	10	6.0E+6
43-K		20	10	3.3E+6
85m-Kr (uncompressed)(1)	Krypton (36)	100	100	8.4E+6
85m-Kr (compressed)(1)		3	3	8.4E+6
85-Kr (uncompressed)(1)		1000	1000	4.0E+2
85-Kr (compressed)(1)		5	5	4.0E+2
87-Kr (uncompressed)(1)		20	20	2.8E+7
87-Kr (compressed)(1)		0.6	0.6	2.8E+7
140-La	Lanthanum (57)	30	30	5.6E+5
LSA	Low specific activity material (See R313-19-4)			
177-Lu	Lutetium (71)	300	25	1.1E+5
MFP	Mixed Fission Products	10	0.4	---
28-Mg	Magnesium (12)	6	6	5.2E+6
52-Mn	Manganese (25)	5	5	4.4E+5
54-Mn		20	20	8.3E+3
56-Mn		5	5	2.2E+7
99-Mo	Molybdenum (42)	100	20	4.7E+5
13-N	Nitrogen (7)	20	10	1.5E+9
22-Na	Sodium (11)	8	8	6.3E+3
24-Na		5	5	8.7E+6
94m-Nb	Niobium (41)	1000	200	1.1E+3
95-Nb		20	20	3.9E+4
97-Nb		20	20	2.6E+7
147-Nd	Neodymium (60)	100	20	8.0E+4
149-Nd		30	20	1.1E+7
59-Ni	Nickel (28)	1000	900	8.1E-2
63-Ni		1000	100	4.6E+1
65-Ni		10	10	1.9E+7
237-Np	Neptunium (93)	5	0.005	6.9E-4
239-Np		200	25	2.3E+5
185-Os	Osmium (76)	20	20	7.3E+3

191-Os		600	200	4.6E+4
191m-Os		200	200	1.2E+6
193-Os		100	20	5.3E+5
32-P	Phosphorus (15)	30	30	2.9E+5
230-Pa	Protactinium (91)	20	0.8	3.2E+4
231-Pa		2	0.002	4.5E-2
233-Pa		100	100	2.1E+4
201-Pb	Lead (82)	20	20	1.7E+6
210-Pb		100	0.2	8.8E+1
212-Pb		6	5	1.4E+6
103-Pd	Palladium (46)	1000	700	7.5E+4
109-Pd		100	20	2.1E+6
147-Pm	Promethium (61)	1000	25	9.4E+2
149-Pm		100	20	4.2E+5
210-Po	Polonium (84)	200	0.2	4.5E+3
142-Pr	Praseodymium (59)	10	10	1.2E+4
143-Pr		300	20	6.6E+4
191-Pt	Platinum (78)	100	100	2.3E+5
193m-Pt		200	200	2.0E+5
197m-Pt		300	20	1.2E+7
197-Pt		300	20	8.8E+5
238-Pu	Plutonium (94)	3	0.003	1.7E+1
239-Pu		2	0.002	6.2E-2
240-Pu		2	0.002	2.3E-1
241-Pu		1000	0.1	1.1E+2
242-Pu		3	0.003	3.9E-3
223-Ra	Radium (88)	50	0.2	5.0E+4
224-Ra		6	0.5	1.6E+5
226-Ra		10	0.05	1.0
228-Ra		10	0.05	2.3E+2
81-Rb	Rubidium (37)	30	25	8.2E+6
86-Rb		30	30	8.1E+4
87-Rb		Unlimited		6.6E-8
Rb (Natural)		Unlimited		1.8E-8
186-Re	Rhenium (75)	100	20	1.9E+5
187-Re		Unlimited		3.8E-8
188-Re		10	10	1.0E+6
Re (Natural)		Unlimited		2.4E-8
103m-Rh	Rhodium (45)	1000	1000	3.2E+7
105-Rh		200	25	8.2E+5
222-Rn	Radon (86)	10	2	1.5E+5
97-Ru	Ruthenium (44)	80	80	5.5E+5
103-Ru		30	25	3.2E+4
105-Ru		20	20	6.6E+6
106-Ru		10	7	3.4E+3
35-S	Sulphur (16)	1000	60	4.3E+4
122-Sb	Antimony (51)	30	30	3.9E+5
124-Sb		5	5	1.8E+4
125-Sb		40	25	1.4E+3
46-Sc	Scandium (21)	8	8	3.4E+4
47-Sc		200	20	8.2E+5
48-Sc		5	5	1.5E+6
75-Se	Selenium (34)	40	40	1.4E+4
31-Si	Silicon (14)	100	20	3.9E+7
147-Sm	Samarium (62)	Unlimited		2.0E-8
151-Sm		1000	90	2.6E+1
153-Sm		300	20	4.4E+5
113-Sn	Tin (50)	60	60	1.0E+4
119m-Sn		100	100	4.4E+3
125-Sn		10	10	1.1E+5
85m-Sr	Strontium (38)	80	80	3.2E+7
85-Sr		30	30	2.4E+4
87m-Sr		50	50	1.2E+7
89-Sr		100	10	2.9E+4

90-Sr		10	0.4	1.5E+2
91-Sr		10	10	3.6E+6
92-Sr		10	10	1.3E+7
T (uncompressed)(1)	Tritium (1)	1000	1000	9.7E+3
T (compressed)(1)		1000	1000	9.7E+3
T (activated luminous paint)		1000	1000	9.7E+3
T (absorbed on solid carrier)		1000	1000	9.7E+3
T (tritiated water)		1000	1000	9.7E+3
T (other forms)		20	20	9.7E+3
182-Ta	Tantalum (73)	20	20	6.2E+3
160-Tb	Terbium (65)	20	10	1.1E+4
96m-Tc	Technetium (43)	1000	1000	3.8E+7
96-Tc		6	6	3.2E+5
97m-Tc		1000	200	1.5E+4
97-Tc		1000	400	1.4E-3
99m-Tc		100	100	5.2E+6
99-Tc		1000	25	1.7E-2
125m-Te	Tellurium (52)	1000	100	1.8E+4
127M-Te		300	20	4.0E+4
127-Te		300	20	2.6E+6
129M-Te		30	10	2.5E+4
129-Te		100	20	2.0E+7
131m-Te		10	10	8.0E+5
132-Te		7	7	3.1E+5
227-Th	Thorium (90)	200	0.2	3.2E+4
228-Th		6	0.008	8.3E+2
230-Th		3	0.003	1.9E-2
231-Th		1000	25	5.3E+5
232-Th		Unlimited		1.1E-7
234-Th		10	10	2.3E+4
Th (natural)		Unlimited		2.2E-7
Th (irradiated)(2)				
200-Tl	Thallium (81)	20	20	5.8E+5
201-Tl		200	200	2.2E+5
202-Tl		40	40	5.4E+4
204-Tl		300	10	4.3E+2
170-Tm	Thulium (69)	300	10	6.0E+3
171-Tm		1000	100	1.1E+3
230-U	Uranium (92)	100	0.1	2.7E+4
232-U		30	0.03	2.1E+1
233-U		100	0.1	9.5E-3
234-U		100	0.1	6.2E-3
235-U		100	0.2	2.1E-6
236-U		200	0.2	6.3E-5
238-U		Unlimited		3.3E-7
U (natural)		Unlimited		See Table 7
U (enriched)				See Table 7
less than 20%		Unlimited		
20% or greater		100	0.1	
U (depleted)		Unlimited		See Table 7
U (irradiated)(3)				
48-V	Vanadium (23)	6	6	1.7E+5
181-W	Tungsten (74)	200	100	5.0E+3
185-W		1000	25	9.7E-3
187-W		40	20	7.0E+5

127-Xe (uncompressed)(1)	Xenon (54)	70	70	2.8E+4
127-Xe (compressed)(1)		5	5	2.8E+4
131m-Xe (compressed)(1)		10	10	1.0E+5
131m-Xe (uncompressed)(1)		100	100	1.0E+5
133-Xe (uncompressed)(1)		1000	1000	1.9E+5
133-Xe (compressed)(1)		5	5	1.9E+5
135-Xe (uncompressed)(1)		70	70	2.5E+5
135-Xe (compressed)(1)		2	2	2.5E+5
87-Y	Yttrium (39)	20	20	4.5E+1
90-Y		10	10	2.5E+5
90m-Y		30	30	4.1E+7
91-Y		30	30	2.5E+4
92-Y		10	10	9.5E+6
93-Y		10	10	3.2E+6
169-Yb	Ytterbium (70)	80	80	2.3E+5
175-Yb		400	25	1.8E+5
65-Zn	Zinc (30)	30	30	8.0E+3
69m-Zn		40	20	3.3E+6
69-Zn		300	20	5.3E+7
93-Zr	Zirconium (40)	1000	200	3.5E-3
95-Zr		20	20	2.1E+4
97-Zr		20	20	2.0E+6

(1) For the purpose of Table 4, compressed gas, means a gas at a pressure which exceeds the ambient atmospheric pressure at the location where the containment system was closed.

(2) The values of A_1 and A_2 shall be calculated in accordance with the procedure specified in R313-19-100(19)(b)(iii), taking into account the activity of the fission products and of the uranium-233 in addition to that of the thorium.

(3) The values of A_1 and A_2 shall be calculated in accordance with the procedure specified R313-19-100(19)(b)(iii), taking into account the activity of the fission products and plutonium radionuclides in addition to that of the uranium.

TABLE 5
Relationship Between A_1 and E_{max}
for Beta Emitters

E_{max} (MeV)	A_1 (Ci)
less than 0.5	1000
0.5 to less than 1.0	300
1.0 to less than 1.5	100
1.5 to less than 2.0	30
greater than or equal to 2.0	10

TABLE 6
Relationship Between A_3 and
the Atomic Number of the Radionuclide

Atomic Number	Half-life Less than	Half-life 1000 Days to	Half-life Greater than

	1000 Days	10^6 Years	10^6 Years
1 to 81	3 Ci	.05 Ci	3 Ci
82 and above	.002 Ci	.002 Ci	3 Ci

TABLE 7
Activity-Mass Relationships for Uranium/Thorium

Thorium and Uranium Enrichment(1) wt % ^{235}U Present	Specific Activity Ci/g	g/Ci
0.45	5.0E-7	2.0E+6
0.72 (natural)	7.06E-7	1.42E+6
1.0	7.6E-7	1.3E+6
1.5	1.0E-6	1.0E+6
5.0	2.7E-6	3.7E+5
10.0	4.8E-6	2.1E+5
20.0	1.0E-5	1.0E+5
35.0	2.0E-5	5.0E+4
50.0	2.5E-5	4.0E+4
90.0	5.8E-5	1.7E+4
93.0	7.0E-5	1.4E+4
95.0	9.1E-5	1.1E+4
Natural Thorium	2.2E-7	4.6E+6

(1) The figures for uranium include representative values for the activity of the uranium-234 which is concentrated during the enrichment process. The activity for thorium includes the equilibrium concentration of thorium-228.

KEY: radioactive material, licensing, radioactive material transportation
[~~1993~~]1994
19-3-104
19-3-108
19-3-113

State of Utah
Administrative Rule Analysis
Notice of Proposed Rule/Change

D.A.R. FILE NUMBER

CODE NUMBER
AGENCY - RULE - SECTION
R 313 - 19 -

Division of Administrative Rules
State Archives Building, State Capitol
Salt Lake City, Utah 84114
Telephone 538-3011

Department: Environmental Quality
Agency: Radiation Control
Address: 168 N 1950 W - P.O. Box 144850
Salt Lake City UT 84114-4850
Contact Person: Craig Jones
Telephone: (801) 536-4250

1. CODE TITLE OF RULE OR SECTION

Requirements of General Applicability to Licensing of Radioactive Material

2. REASON FOR AND SUMMARY OF RULE OR CHANGE

The proposed rule imposes a time limit for immediate reports of events in which radiation protection actions for the public are prevented by the circumstances of the event, such as in the case of fires, explosions or toxic gas releases which prevent access to the source of radiation. The rule also establishes criteria under which reporting is required within 24 hours.

3. COST OR SAVINGS IMPACT OF RULE - UCA 63-46a-4(3)

STATE BUDGET: NONE

LOCAL GOV'T: NONE

PUBLIC: NONE

4. TYPE OF NOTICE

☒ PROPOSED RULE (☐ NEW ☒ AMEND ☐ REPEAL)
☐ CHANGE IN PROPOSED RULE (CHANGES PROPOSED RULE FILE NUMBER _____)
☐ 120-DAY RULE - UCA 63-46a-7
☐ FIVE-YEAR REVIEW / CONTINUATION

5. JUSTIFICATION FOR 120-DAY RULE CHECKED ABOVE - UCA 63-46a-7(1)

6. ☒ RULE AUTHORIZED BY STATE CODE / CONSTITUTION (CITATION): UCA 19-3-104, 19-3-108 & 19-3-113
☐ RULE REQUIRED BY FEDERAL MANDATE (U.S. CODE, CFR, OR FED. REGISTER CITATION):

7. PUBLIC MAY PARTICIPATE IN RULEMAKING BY: (REQUIRED ONLY FOR PROPOSED RULES)
WRITTEN OR ORAL COMMENT
UNTIL: 10/17/94
PUBLIC HEARING (MAY BE OPTIONAL)
DATE:
TIME:
PLACE:
NOTE: PUBLIC MAY REQUEST HEARING IN ACCORDANCE WITH UCA 63-46a-5(2)(b)

THIS RULE/CHANGE MAY BECOME EFFECTIVE ON:
10/18/94

8. INDEXING INFORMATION
AGENCY NOTE: TEXT MUST BE IN CODE FORMAT
STATE STATUTE CITATION(S): UCA 19-3-104, 19-3-108 & 19-3-113
KEY WORD(S): radioactive material, licensing, radioactive material transportation

THE FULL TEXT OF ALL PROPOSED ADMINISTRATIVE RULES OR RULE CHANGES IS PUBLISHED IN THE UTAH STATE BULLETIN UNLESS EXCLUDED BECAUSE OF LENGTH AND SPACE LIMITATION. THE FULL TEXT MAY BE INSPECTED AT THE AGENCY (ADDRESS ABOVE) OR DIVISION OF ADMINISTRATIVE RULES.

9. AUTHORIZATION

William J. Sinclair, Exe. Secretary 8/26/94
AGENCY HEAD OR DESIGNEE DATE

Utah Radiation Control Board
AGENCY

SEND WHITE & YELLOW TO D.A.R., YELLOW WILL BE RETURNED TO AGENCY

10. DIVISION OF ADMINISTRATIVE RULES
RECEIVED BY: DATE: TIME:
120-DAY RULE EFFECTIVE: LAPSES:
☐ TOO LONG TO PRINT PAGES:

12/90

56 FR 64980
effective date 7/16/93

R313. Environmental Quality, Radiation Control.
R313-22. Specific Licenses.
[~~R313-22-1. Purpose and Scope.~~
~~(1) This chapter prescribes requirements for the issuance of specific licenses.~~
~~(2) The provisions and requirements of this chapter are in addition to, and not in substitution for, other requirements of these rules. In particular the provisions of R313-19 apply to applications and licenses subject to this chapter.~~]
R313-22-1. Purpose and Authority.
(1) The purpose of this rule is to prescribe the requirements for the issuance of specific licenses.
(2) The rules set forth herein are adopted pursuant to the provisions of Sections 19-3-101 through 19-3-301.

R313-22-2. General.
The provisions and requirements of R313-22 are in addition to, and not in substitution for, other requirements of these rules. In particular the provisions of R313-19 apply to applications and licenses subject to R313-22.

R313-22-4. Definitions.
"Alert" means events may occur, are in progress, or have occurred that could lead to a release of radioactive material but that the release is not expected to require a response by offsite response organizations to protect persons offsite.
"Decommission" means to remove, as a facility, safely from service and reduce residual radioactivity to a level that permits release of the property for unrestricted use and termination of license.
"Site Area Emergency" means events may occur, are in progress, or have occurred that could lead to a significant release of radioactive material and that could require a response by offsite response organizations to protect persons offsite.

R313-22-32. Filing Application for Specific Licenses.
(1) Applications for specific licenses shall be filed on [~~BRC form 01 or form 02~~]a form prescribed by the Executive Secretary.
(2) The [~~Bureau may at any time~~]Executive Secretary may, after the filing of the original application, and before the expiration of the license, require further statements in order to enable the [~~Bureau~~]Executive Secretary to determine whether the application should be granted or denied or whether a license should be modified or revoked.
(3) [~~Each application~~]Applications shall be signed by the applicant or licensee or a person duly authorized to act for and on the applicant's behalf.
(4) An application for a license may include a request for a license authorizing one or more activities.
(5) In the application, the applicant may incorporate by reference information contained in previous applications, statements, or reports filed with the [~~Bureau~~]Executive Secretary, provided [~~such~~]the references are clear and specific.
(6) An application for a specific license to use radioactive material in the form of a sealed source or in a device that contains the sealed source must either:
(a) identify the source or device by manufacturer and model number as registered with the [~~Bureau or~~]U.S. Nuclear Regulatory Commission under [~~10 CFR 32.210~~]10 CFR 32.210, the Executive Secretary, or [~~with~~]an Agreement State; or
(b) contain the information identified in R313-22-210.
(7) As provided by R313-22-35, certain applications for specific licenses filed under these rules must contain a proposed decommissioning funding plan or a certification of financial assurance for decommissioning. In the case of renewal applications submitted before January 1, 1995, this submittal may follow the renewal application but must be submitted on or before January 1, 1995.
(8)(a) Applications to possess radioactive materials in unsealed form, on foils or plated sources, or sealed in glass in excess of the quantities in R313-22-90, "Quantities of Radioactive Materials Requiring Consideration of the Need

for an Emergency Plan for Responding to a Release", must contain either:

(i) An evaluation showing that the maximum dose to a person offsite due to a release of radioactive materials would not exceed one rem effective dose equivalent or five rems to the thyroid; or

(ii) An emergency plan for responding to a release of radioactive material.

(b) One or more of the following factors may be used to support an evaluation submitted under R313-22-32(8)(a)(i):

(i) The radioactive material is physically separated so that only a portion could be involved in an accident;

(ii) All or part of the radioactive material is not subject to release during an accident because of the way it is stored or packaged;

(iii) The release fraction in the respirable size range would be lower than the release fraction shown in R313-22-90 due to the chemical or physical form of the material;

(iv) The solubility of the radioactive material would reduce the dose received;

(v) Facility design or engineered safety features in the facility would cause the release fraction to be lower than shown in R313-22-90;

(vi) Operating restrictions or procedures would prevent a release fraction as large as that shown in R313-22-90; or

(vii) Other factors appropriate for the specific facility.

(c) An emergency plan for responding to a release of radioactive material submitted under R313-22-32(8)(a)(ii) must include the following information:

(i) Facility description. A brief description of the licensee's facility and area near the site.

(ii) Types of accidents. An identification of each type of radioactive materials accident for which protective actions may be needed.

(iii) Classification of accidents. A classification system for classifying accidents as alerts or site area emergencies.

(iv) Detection of accidents. Identification of the means of detecting each type of accident in a timely manner.

(v) Mitigation of consequences. A brief description of the means and equipment for mitigating the consequences of each type of accident, including those provided to protect workers onsite, and a description of the program for maintaining equipment.

(vi) Assessment of releases. A brief description of the methods and equipment to assess releases of radioactive materials.

(vii) Responsibilities. A brief description of the responsibilities of licensee personnel should an accident occur, including identification of personnel responsible for promptly notifying offsite response organizations and the Executive Secretary; also responsibilities for developing, maintaining, and updating the plan.

(viii) Notification and coordination. A commitment to and a brief description of the means to promptly notify offsite response organizations and request offsite assistance, including medical assistance for the treatment of contaminated injured onsite workers when appropriate. A control point must be established. The notification and coordination must be planned so that unavailability of some personnel, parts of the facility, and some equipment will not prevent the notification and coordination. The licensee shall also commit to notify the Executive Secretary immediately after notification of the appropriate offsite response organizations and not later than one hour after the licensee declares an emergency.

NOTE: These reporting requirements do not superceed or release licensees of complying with the requirements under the Emergency Planning and Community Right-to-Know Act of 1986, Title III, Public Law 99-499 or other state or federal reporting requirements.

(ix) Information to be communicated. A brief description of the types of information on facility status, radioactive releases, and recommended protective actions, if necessary, to be given to offsite response organizations and to the Executive Secretary.

(x) Training. A brief description of the frequency, performance objectives and plans for the training that the licensee will provide workers on how to respond to an emergency including special instructions and orientation

tours the licensee would offer to fire, police, medical and other emergency personnel. The training shall familiarize personnel with site-specific emergency procedures. Also, the training shall thoroughly prepare site personnel for their responsibilities in the event of accident scenarios postulated as most probable for the specific site including the use of team training for the scenarios.

(xi) Safe shutdown. A brief description of the means of restoring the facility to a safe condition after an accident.

(xii) Exercises. Provisions for conducting quarterly communications checks with offsite response organizations and biennial onsite exercises to test response to simulated emergencies. Quarterly communications checks with offsite response organizations must include the check and update of all necessary telephone numbers. The licensee shall invite offsite response organizations to participate in the biennial exercises. Participation of offsite response organizations in biennial exercies although recommended is not required. Exercises must use accident scenarios postulated as most probable for the specific site and the scenarios shall not be known to most exercise participants. The licensee shall critique each exercise using individuals not having direct implementation responsibility for the plan. Critiques of exercises must evaluate the appropriateness of the plan, emergency procedures, facilities, equipment, training of personnel, and overall effectiveness of the response. Deficiencies found by the critiques must be corrected.

(xiii) Hazardous chemicals. A certification that the applicant has met its responsibilities under the Emergency Planning and Community Right-to-Know Act of 1986, Title III, Public Law 99-499, if applicable to the applicant's activities at the proposed place of use of the radioactive material.

(d) The licensee shall allow the offsite response organizations expected to respond in case of an accident 60 days to comment on the licensee's emergency plan before submitting it to the Executive Secretary. The licensee shall provide any comments received within the 60 days to the Executive Secretary with the emergency plan.

R313-22-33. General Requirements for the Issuance of Specific Licenses.

(1) A license application shall be approved if the [~~Bureau~~]Executive Secretary determines that:

[~~(1)~~](a) [~~The~~]the applicant is qualified by reason of training and experience to use the material in question for the purpose requested in accordance with these rules in [~~such~~]a manner as to minimize danger to public health and safety or property[~~,~~];

[~~(2)~~](b) [~~The~~]the applicant's proposed equipment, facilities, and procedures are adequate to minimize danger to public health and safety or property;

[~~(3)~~](c) [~~The~~]the issuance of the license will not be inimical to the health and safety of the public[~~,~~];

[~~(4)~~](d) [~~The~~]the applicant satisfies [~~any~~]applicable special requirements in R313-22-50, R313-22-75, R313-25, R313-32, R313-36, or R313-38[~~and R313-32-18.~~]; and

[~~(5)~~](e) [~~In~~]in the case of an application for a license to receive and possess radioactive material for commercial waste disposal by land burial, or for the conduct of [~~any~~]other [~~activity~~]activities which the [~~Bureau~~]Executive Secretary determines will significantly affect the quality of the environment, the [~~Bureau~~]Executive Secretary, before commencement of construction of the plant or facility in which the activity will be conducted, has concluded, after weighing the environmental, economic, technical and other benefits against environmental costs and considering available alternatives, that the action called for is the issuance of the proposed license, with any appropriate conditions to protect environmental values. The [~~Bureau~~]Executive Secretary shall respond to the application within 60 days. Commencement of construction prior to [~~such~~]a response and conclusion shall be grounds for denial of a license to receive and possess radioactive material in [~~such~~]the plant or facility. As used in this paragraph the term "commencement of construction" means[~~any~~] clearing of land, excavation, or other substantial action that would adversely affect the environment of a site. The term does not mean site exploration, necessary borings to determine foundation conditions, or other preconstruction monitoring or testing to establish background information related to the

suitability of the site or the protection of environmental values.

[~~(6) (a) Pursuant to Utah Code Annotated Vol. 3, Title 26, and as otherwise provided, financial surety arrangements for site reclamation which may consist of surety bonds, cash deposits, certificates of deposit, deposits of government securities, letters or lines of credit, or any combination of the above for the categories of licensees listed in R313-22-33(6)(d) shall be established to ensure the protection of the public health and safety in the event of abandonment, default, or other inability of the licensee to meet the requirements of these rules.~~

~~(i) The amount of funds to be ensured by such surety arrangements shall be based on Bureau approved cost estimates.~~

~~(b) The arrangements required in R313-22-33(6)(a) shall be established prior to issuance of the license to assure that sufficient funds will be available to carry out the decontamination and decommissioning of the facility.~~

~~(c) Amendments to licenses in effect on (November 8, 1982) may be issued providing that the required surety arrangements are established within 90 days after the effective date of R313-22-33(6).~~

~~(d) The following specific licensees are required to make financial surety arrangements:~~

~~(i) major processors;~~

~~(ii) waste handling licensees;~~

~~(iii) former U.S. Atomic Energy Commission or U.S. Nuclear Regulatory Commission licensed facilities; previously required to have surety or bonding arrangements;~~

~~(iv) source material recovery operations; and~~

~~(v) all others except persons exempt pursuant to R313-22-33(6)(e).~~

~~(e) The following persons are exempt from the requirements of R313-22-33(6)(a):~~

~~(i) all state, local, or other government agencies, unless they are subject to R313-22-33(6)(d)(ii) or (iv);~~

~~(ii) persons authorized to possess no more than 1,000 times the quantity specified in R313-19-71 or combination of radioactive material listed therein as given in Note 1, of this chapter;~~

~~(iii) persons authorized to possess hydrogen-3 contained as hydrogen gas in a sealed source; or~~

~~(iv) persons authorized to possess radioactive noble gases in sealed sources with no radioactive daughter product with half life greater than 30 days.~~

~~(7) Pursuant to Utah Code Annotated Vol. 3, Title 26, and as otherwise provided, a long term care fund shall be established by the following specific licensees prior to the issuance of the license or prior to the termination of the license if the applicant chooses at the time of the licensure to provide a surety in lieu of a long term care fund:~~

~~(a) waste handling licensees; and~~

~~(b) source material recovery licensees.~~

~~NOTE: 1. For purposes of R313-22-33(6)(e)(ii) where there is involved a combination of isotopes, the limit for the combination should be derived as follows:~~

~~Determine the amount of each isotope possessed and 1,000 times the amount in R313-19-71 for each of those isotopes when not in combination. The sum of the ratios of those quantities may not exceed 1.~~

~~EXAMPLE:~~

~~Amt. of Isotope A possessed / 1,000 x R313-19-71 quantity for Isotope A + Amt. of Isotope B possessed / 1,000 x R313-19-71 quantity for Isotope B less than or equal to 1~~

~~NOTE: 2. To convert microcuries (uCi) to SI units of kilobecquerels (kBq), multiply the above values by 37.~~

~~EXAMPLE:~~

~~Zirconium 97 (10 uCi multiplied by 37 is equivalent to 370.0 kBq).~~]

R313-22-34. Issuance of Specific Licenses.

(1) Upon a determination that an application meets the requirements of the Act and the rules of the [~~Bureau~~]Board, the [~~Bureau~~]Executive Secretary will issue a specific license authorizing the proposed activity in [~~such~~]a form and containing [~~such~~]conditions and limitations as [~~it~~]the Executive Secretary deems

appropriate or necessary.

(2) The [~~Bureau~~]Executive Secretary may incorporate in [~~any~~]licenses at the time of issuance, [~~such~~]additional requirements and conditions with respect to the licensee's receipt, possession, use and transfer of radioactive material subject to [~~this chapter~~]R313-22 as [~~it~~]he deems appropriate or necessary in order to:

(a) minimize danger to public health and safety or property;

(b) require [~~such~~]reports and the keeping of [~~such~~]records, and to provide for [~~such~~]inspections of activities under the license as may be appropriate or necessary; and

(c) prevent loss or theft of material subject to [~~this chapter~~]R313-22.

R313-22-35. Financial Assurance and Recordkeeping for Decommissioning.

(1) Applicants for a specific license authorizing the possession and use of unsealed radioactive material of half-life greater than 120 days and in quantities exceeding 10^5 times the applicable quantities set forth in R313-15-430 shall submit a decommissioning funding plan as described in R313-22-35(5). The decommissioning funding plan must also be submitted when a combination of radionuclides is involved if R divided by 10^5 is greater then one, where R is defined here as the sum of the ratios of the quantity of each radionuclide to the applicable value in R313-15-430.

(2) Applicants for a specific license authorizing possession and use of radioactive material of half-life greater than 120 days and in quantities specified in R313-22-35(4) shall either:

(a) submit a decommissioning funding plan as described in R313-22-35(5); or

(b) submit a certification that financial assurance for decommissioning has been provided in the amount prescribed by R313-22-35(4) using one of the methods described in R313-22-35(6). For an applicant, this certification may state that the appropriate assurance will be obtained after the application has been approved and the license issued but prior to the receipt of licensed material. As part of the certification, a copy of the financial instrument obtained to satisfy the requirements of R313-22-35(6) is to be submitted to the Executive Secretary.

(3)(a) Holders of a specific license issued on or after January 1, 1995, which is of a type described in R313-22-35(1) or (2) shall provide financial assurance for decommissioning in accordance with the criteria set forth in R313-22-35.

(b) Holders of a specific license issued before January 1, 1995, and of a type described in R313-22-35(1) shall submit, on or before January 1, 1995, a decommissioning funding plan or a certification of financial assurance for decommissioning in an amount at least equal to $750,000 in accordance with the criteria set forth in R313-22-35. If the licensee submits the certification of financial assurance rather than a decommissioning funding plan at this time, the licensee shall include a decommissioning funding plan in any application for license renewal.

(c) Holders of a specific license issued before January 1, 1995, and of a type described in R313-22-35(2) shall submit, on or before January 1, 1995, a certification of financial assurance for decommissioning or a decommissioning funding plan in accordance with the criteria set forth in R313-22-35.

(4) Table of required amounts of financial assurance for decommissioning by quantity of material:

Greater than 10^4 but less than or equal to 10^5 times the applicable quantities of R313-15-430 in unsealed form. For a combination of radionuclides, if R, as defined in R313-22-35(1) divided by 10^4 is greater than one but R divided by 10^5 is less than or equal to one:	$750,000
Greater than 10^3 but less than or equal to 10^4 times the applicable quantities of R313-15-430 in unsealed form. For a combination of radionuclides, if R, as defined in R313-22-35(1) divided by 10^3 is greater than one but R divided by 10^4 is less than or equal to one:	$150,000

Greater than 10^{10} times the applicable quantities of R313-15-430 in sealed sources or plated foils. For combination of radionuclides, if R, as defined in R313-22-35(1), divided by 10^{10} is greater than one:	$75,000

(5) A decommissioning funding plan must contain a cost estimate for decommissioning and a description of the method of assuring funds for decommissioning from R313-22-35(6), including means of adjusting cost estimates and associated funding levels periodically over the life of the facility.

(6) Financial assurance for decommissioning must be provided by one or more of the following methods:

(a) Prepayment. Prepayment is the deposit prior to the start of operation into an account segregated from licensee assets and outside the licensee's administrative control of cash or liquid assets so that the amount of funds would be sufficient to pay decommissioning costs. Prepayment may be in the form of a trust, escrow account, government fund, certificate of deposit, or deposit of government securities;

(b) A surety method, insurance, or other guarantee method. These methods shall guarantee that decommissioning costs will be paid should the licensee default. A surety method may be in the form of a surety bond, letter of credit, or line of credit. A parent company guarantee of funds for decommissioning costs based on a financial test may be used if the guarantee and test are as contained in R313-22-35(8). A parent company guarantee may not be used in combination with other financial methods to satisfy the requirements of R313-22-35. A surety method or insurance used to provide financial assurance for decommissioning must contain the following conditions:

(i) the surety method or insurance must be open-ended or, if written for a specified term, such as five years, must be renewed automatically unless 90 days or more prior to the renewal date the issuer notifies the Executive Secretary, the beneficiary, and the licensee of its intention not to renew. The surety method or insurance must also provide that the full face amount be paid to the beneficiary automatically prior to the expiration without proof of forfeiture if the licensee fails to provide a replacement acceptable to the Executive Secretary within 30 days after receipt of notification of cancellation,

(ii) the surety method or insurance must be payable to a trust established for decommissioning costs. The trustee and trust must be acceptable to the Executive Secretary. An acceptable trustee includes an appropriate State or Federal government agency or an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or State agency, and

(iii) the surety method or insurance must remain in effect until the Executive Secretary has terminated the license;

(c) An external sinking fund in which deposits are made at least annually, coupled with a surety method or insurance, the value of which may decrease by the amount being accumulated in the sinking fund. An external sinking fund is a fund established and maintained by setting aside funds periodically in an account segregated from licensee assets and outside the licensee's administrative control in which the total amount of funds would be sufficient to pay decommissioning costs at the time termination of operation is expected. An external sinking fund may be in the form of a trust, escrow account, government fund, certificate of deposit, or deposit of government securities. The surety or insurance provisions must be as stated in R313-22-35(6)(b); or

(d) In the case of Federal, State or local government licensees, a statement of intent containing a cost estimate for decommissioning or an amount based on the Table in R313-22-35(4) and indicating that funds for decommissioning will be obtained when necessary.

(7) Persons licensed under R313-22 shall keep records of information important to the safe and effective decommissioning of the facility in an identified location until the license is terminated by the Executive Secretary. If records of relevant information are kept for other purposes, reference to these records and their locations may be used. Information the Executive Secretary considers important to decommissioning consists of the following:

(a) records of spills or other unusual occurrences involving the spread

of contamination in and around the facility, equipment, or site. These records may be limited to instances when contamination remains after any cleanup procedures or when there is reasonable likelihood that contaminants may have spread to inaccessible areas as in the case of possible seepage into porous materials such as concrete. These records must include any known information on identification of involved nuclides, quantities, forms, and concentrations;

(b) as-built drawings and modification of structures and equipment in restricted areas where radioactive materials are used or stored, and of locations of possible inaccessible contamination such as buried pipes which may be subject to contamination. If required drawings are referenced, each relevant document need not be indexed individually. If drawings are not available, the licensee shall substitute appropriate records of available information concerning these areas and locations; and

(c) records of the cost estimate performed for the decommissioning funding plan or of the amount certified for decommissioning, and records of the funding method used for assuring funds if either a funding plan or certification is used.

(8) Criteria relating to use of financial tests and parent company guarantees for providing reasonable assurance of funds for decommissioning.

(a) To pass the financial test referred to in R313-22-35(6)(b), the parent company must meet one of the following criteria:

(i) The parent company must have all of the following:

(A) Two of the following three ratios: a ratio of total liabilities to net worth less than 2.0; a ratio of the sum of net income plus depreciation, depletion, and amortization to total liabilities greater than 0.1; and a ratio of current assets to current liabilities greater than 1.5;

(B) Net working capital and tangible net worth each at least six times the current decommissioning cost estimates, or prescribed amount if a certification is used;

(C) Tangible net worth of at least $10 million; and

(D) Assets located in the United States amounting to at least 90 percent of total assets or at least six times the current decommissioning cost estimates, or prescribed amount if a certification is used; or

(ii) The parent company must have all of the following:

(A) A current rating for its most recent bond issuance of AAA, AA, A, or BBB as issued by Standard and Poor's or Aaa, Aa, A or Baa as issued by Moody's;

(B) Tangible net worth at least six times the current decommissioning cost estimate, or prescribed amount if a certification is used;

(C) Tangible net worth of at least $10 million; and

(D) Assets located in the United States amounting to at least 90 percent of total assets or at least six times the current decommissioning cost estimates, or prescribed amount if certification is used.

(b) The parent company's independent certified public accountant must have compared the data used by the parent company in the financial test, which is derived from the independently audited, year end financial statements for the latest fiscal year, with the amounts in such financial statement. In connection with that procedure the licensee shall inform the Executive Secretary within 90 days of any matters coming to the auditor's attention which cause the auditor to believe that the data specified in the financial test should be adjusted and that the company no longer passes the test.

(c)(i) After the initial financial test, the parent company must repeat the passage of the test within 90 days after the close of each succeeding fiscal year.

(ii) If the parent company no longer meets the requirements of R313-22-35(8)(a) the licensee must send notice to the Executive Secretary of intent to establish alternative financial assurance as specified in R313-22-35. The notice must be sent by certified mail within 90 days after the end of the fiscal year for which the year end financial data show that the parent company no longer meets the financial test requirements. The licensee must provide alternate financial assurance within 120 days after the end of such fiscal year.

(d) The terms of a parent company guarantee which an applicant or licensee obtains must provide that:

(i) The parent company guarantee will remain in force unless the guarantor sends notice of cancellation by certified mail to the licensee and the Executive Secretary. Cancellation may not occur, however, during the 120 days beginning

on the date of receipt of the notice of cancellation by both the licensee and the Executive Secretary, as evidenced by the return receipts.

(ii) If the licensee fails to provide alternate financial assurance as specified in R313-22-35 within 90 days after receipt by the licensee and Executive Secretary of a notice of cancellation of the parent company guarantee from the guarantor, the guarantor will provide such alternative financial assurance in the name of the licensee.

(iii) The parent company guarantee and financial test provisions must remain in effect until the Executive Secretary has terminated the license.

(iv) If a trust is established for decommissioning costs, the trustee and trust must be acceptable to the Executive Secretary. An acceptable trustee includes an appropriate State or Federal Government agency or an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or State agency.

R313-22-36. Expiration of Licenses.

(1) Except as provided in R313-22-37(2), [~~each~~]specific licenses shall expire at the end of the day, in the month and year stated therein.

(2) Each licensee shall notify the Executive Secretary, in writing, and request termination of the license when the licensee decides to terminate all activities involving radioactive material authorized under the license. This notification and request for termination of the license must include the reports and information specified in R313-22-36(4)(a)(iv) and (v).

(3) No less then 30 days before the expiration date specified in the license, the licensee shall either:

(a) submit an application for license renewal under R313-22-37; or

(b) notify the Executive Secretary, in writing, if the licensee decided not to renew the license.

(4)(a) If a licensee dose not submit an application for license renewal under R313-22-37, the licensee shall, on or before the expiration date specified in the license:

(i) terminate use of radioactive material;

(ii) remove radioactive contamination to the extent practicable;

(iii) properly dispose of radioactive material;

(iv) submit a completed Form DRC-14; and

(v) submit a radiation survey report to confirm the absence of radioactive material or to establish the levels of residual radioactive contamination, unless the licensee demonstrates the absence of residual radioactive contamination in some other acceptable manner. The licensee shall, as appropriate:

(A) report levels of radiation in units of microrads per hour of beta and gamma radiation at one centimeter and gamma radiation at one meter from surfaces; and report levels of radioactivity, including alpha, in units of disintegrations per minute, or microcuries, per 100 square centimeters removable and fixed on surfaces; microcuries per milliliter in water; and picocuries per gram in contaminated solids such as soils or concrete; and

(B) specify the instrumentation used and certify that each instrument was properly calibrated and tested.

(b) If no residual radioactive contamination attributable to activities conducted under the license is detected, the licensee shall submit a certification that no detectable radioactive contamination was found. The Executive Secretary will notify the licensee, in writing, of the termination of the license.

(c)(i) If detectable levels of residual radioactive contamination attributable to activities conducted under the license are found, the license continues in effect beyond the expiration date, if necessary, with respect to possession of residual radioactive material present as contamination until the Executive Secretary notifies the licensee in writing that the license is terminated. During this time the licensee is subject to the provisions of R313-22-36(5).

(ii) In addition to the information submitted under R313-22-36(4)(a)(iv) and (v), the licensee shall submit a plan for decontamination, if required, as regards residual radioactive contamination remaining at the time the license expires.

(5) Each licensee who possesses residual radioactive material under R313-

22-36(4)(c), following the expiration date specified in the license shall:

(a) limit actions involving radioactive material to those related to decontamination and other activities related to preparation for release for unrestricted use; and

(b) continue to control entry to restricted areas until they are suitable for release for unrestricted use and the Executive Secretary notifies the licensee in writing that the license is terminated.

R313-22-37. Renewal of Licenses.

(1) Applications for renewal of specific licenses shall be filed in accordance with R313-22-32.

(2) In [~~any~~]cases in which a licensee, [~~not less than thirty days prior to expiration of the existing license,~~]has filed an application in proper form for renewal or for a new license authorizing the same activities, not less than 30 days prior to expiration of the existing license, the [~~such~~] existing license shall not expire until the application has been finally determined by the [~~Bureau~~]Executive Secretary.

R313-22-38. Amendment of Licenses at Request of Licensee.

Applications for amendment of a license shall be filed in accordance with R313-22-32 and shall specify the respects in which the licensee desires the license to be amended and the grounds for [~~such~~]the amendment.

R313-22-39. [~~Bureau~~]Executive Secretary Action on Applications to Renew or Amend.

In considering an application by a licensee to renew or amend the license, the [~~Bureau~~]Executive Secretary will use the criteria set forth in R313-22-33, R313-22-50, and R313-22-75 [~~or R313-32-18~~]and in R313-25, R313-32, R313-36, or R313-38, as applicable.

R313-22-50. Special Requirements for Specific Licenses of Broad Scope.

[~~This section prescribes requirements for the issuance of specific licenses of broad scope for radioactive material ("broad licenses") and certain rules governing holders of such licenses.*~~

[~~NOTE: *~~]Authority to transfer possession or control by the manufacturer, processor, or producer of any equipment, device, commodity or other product containing [~~source material or~~]byproduct material whose subsequent possession, use, transfer and disposal by all other persons who are exempted from regulatory requirements may be obtained only from the [~~United States~~]U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

(1) The different types of broad licenses are set forth below:

(a) A "Type A specific license of broad scope" is a specific license authorizing receipt, acquisition, ownership, possession, use and transfer of any chemical or physical form of the radioactive material specified in the license, but not exceeding quantities specified in the license, for any authorized purpose. The quantities specified are usually in the multicurie range.

(b) A "Type B specific license of broad scope" is a specific license authorizing receipt, acquisition, ownership, possession, use and transfer of any chemical or physical form of radioactive material specified in R313-22-100 for any authorized purpose. The possession limit for a Type B broad license, if only one radionuclide is possessed thereunder, is the quantity specified for that radionuclide in R313-22-100, Column I. If two or more radionuclides are possessed thereunder, the possession limits [~~for each is~~]are determined as follows: For each radionuclide, determine the ratio of the quantity possessed to the applicable quantity specified in R313-22-100, Column I, for that radionuclide. The sum of the ratios for [~~all~~]the radionuclides possessed under the license shall not exceed unity.

(c) A "Type C specific license of broad scope" is a specific license authorizing receipt, acquisition, ownership, possession, use and transfer of any chemical or physical form of radioactive material specified in R313-22-100, for any authorized purpose. The possession limit for a Type C broad license, if only one radionuclide is possessed thereunder, is the quantity specified for that radionuclide in R313-22-100, Column II. If two or more radionuclides are possessed thereunder, the possession limits [~~is~~]are determined [~~for each~~]as

follows: For each radionuclide, determine the ratio of the quantity possessed to the applicable quantity specified in R313-22-100, Column II, for that radionuclide. The sum of the ratios for [~~all~~]the radionuclides possessed under the license shall not exceed unity.

(2) An application for a Type A specific license of broad scope shall be approved if all of the following are complied with:

(a) the applicant satisfies the general requirements specified in R313-22-33;

(b) the applicant has engaged in a reasonable number of activities involving the use of radioactive material; and

(c) the applicant has established administrative controls and provisions relating to organization and management, procedures, recordkeeping, material control and accounting, and management review that are necessary to assure safe operations, including:

(i) the establishment of a radiation safety committee composed of such persons as a radiation safety officer, a representative of management, and persons trained and experienced in the safe use of radioactive material;

(ii) the appointment of a radiation safety officer who is qualified by training and experience in radiation protection, and who is available for advice and assistance on radiation safety matters; and

(iii) the establishment of appropriate administrative procedures to assure:

(A) control of procurement and use of radioactive material[~~;~~],

(B) completion of safety evaluations of proposed uses of radioactive material which take into consideration such matters as the adequacy of facilities and equipment, training and experience of the user, and the operating or handling procedures[~~;~~], and

(C) review, approval, and recording by the radiation safety committee of safety evaluations of proposed uses prepared in accordance with [~~item (2)(c)(iii)(B) of this section~~]R313-22-50(2)(c)(iii)(B) prior to use of the radioactive material.

(3) An application for a Type B specific license of broad scope shall be approved if all of the following are complied with:

(a) the applicant satisfies the general requirements specified in R313-22-33;

(b) the applicant has established administrative controls and provisions relating to organization and management, procedures, recordkeeping, material control and accounting, and management review that are necessary to assure safe operations, including:

(i) the appointment of a radiation safety officer who is qualified by training and experience in radiation protection, and who is available for advice and assistance on radiation safety matters; and

(ii) the establishment of appropriate administrative procedures to assure:

(A) control of procurement and use of radioactive material[~~;~~],

(B) completion of safety evaluations of proposed uses of radioactive material which take into consideration such matters as the adequacy of facilities and equipment, training and experience of the user, and the operating or handling procedures[~~;~~], and

(C) review, approval, and recording by the radiation safety officer of safety evaluations of proposed uses prepared in accordance with [~~item (3)(b)(ii)(B) of this section~~]R313-22-50(3)(b)(iii)(B) prior to use of the radioactive material.

(4) An application for a Type C specific license of broad scope shall be approved, if:

(a) the applicant satisfies the general requirements specified in R313-22-33;

(b) the applicant submits a statement that radioactive material will be used only by, or under the direct supervision of individuals, who have received:

(i) a college degree at the bachelor level, or equivalent training and experience, in the physical or biological sciences or in engineering; and

(ii) at least forty hours of training and experience in the safe handling of radioactive material, and in the characteristics of ionizing radiation, units of radiation dose and quantities, radiation detection instrumentation, and biological hazards of exposure to radiation appropriate to the type and forms of

radioactive material to be used; and

(c) the applicant has established administrative controls and provisions relating to procurement of radioactive material, procedures, recordkeeping, material control and accounting, and management review necessary to assure safe operations[~~,~~].

(5) Specific licenses of broad scope are subject to the following conditions[~~:~~]:

(a) unless specifically authorized by the [~~Bureau~~]Executive Secretary, persons licensed pursuant to this section shall not:

(i) conduct tracer studies in the environment involving direct release of radioactive material;

(ii) receive, acquire, own, possess, use, or transfer devices containing 100,000 curies (3.7 PBq) or more of radioactive material in sealed sources used for irradiation of materials;

(iii) conduct activities for which a specific license issued by the [~~Bureau~~]Executive Secretary under R313-22-75[~~or R313-32-10~~], R313-25, R313-32 or R313-36 is required; or

(iv) add or cause the addition of radioactive material to [~~any~~]a food, beverage, cosmetic, drug or other product designed for ingestion or inhalation by, or application to, a human being[~~,~~].

(b) [~~Each~~]Type A specific licenses of broad scope issued under [~~this chapter~~]R313-22 shall be subject to the condition that radioactive material possessed under the license may only be used by, or under the direct supervision of, individuals approved by the licensee's radiation safety committee.

(c) [~~Each~~]Type B specific license of broad scope issued under [~~this chapter~~]R313-22 shall be subject to the condition that radioactive material possessed under the license may only be used by, or under the direct supervision of, individuals approved by the licensee's radiation safety officer.

(d) [~~Each~~]Type C specific license of broad scope issued under [~~this chapter~~]R313-22 shall be subject to the condition that radioactive material possessed under the license may only be used, by or under the direct supervision of, individuals who satisfy the requirements of [~~subsection (4) of this section~~]R313-22-50(4).

R313-22-75. Special Requirements for a Specific License to Manufacture, Assemble, Repair, or Distribute Commodities, Products, or Devices Which Contain Radioactive Material.

(1) Licensing the introduction of radioactive material into products in exempt concentrations.[~~In addition to the requirements set forth in R313-22-33, a specific license authorizing the introduction of radioactive material into a product or material owned by or in the possession of the licensee or another to be transferred to persons exempt under R313-19-13(2)(a) will be issued if:~~]

(a) In addition to the requirements set forth in R313-22-33, a specific license authorizing the introduction of radioactive material into a product or material owned by or in the possession of the licensee or another to be transferred to persons exempt under R313-19-13(2)(a) will be issued if:

[~~(a)~~](i) the applicant submits a description of the product or material into which the radioactive material will be introduced, intended use of the radioactive material and the product or material into which it is introduced, method of introduction, initial concentration of the radioactive material in the product or material, control methods to assure that no more than the specified concentration is introduced into the product or material, estimated time interval between introduction and transfer of the product or material, and estimated concentration of the radioactive material in the product or material at the time of transfer; and

[~~(b)~~](ii) the applicant provides reasonable assurance that the concentrations of radioactive material at the time of transfer will not exceed the concentrations in R313-19-70, that reconcentration of the radioactive material in concentrations exceeding those in R313-19-70 is not likely, that use of lower concentrations is not feasible, and that the product or material is not likely to be incorporated in any food, beverage, cosmetic, drug or other commodity or product designed for ingestion or inhalation by, or application to a human being[~~,~~].

[~~(c) each person~~](b) Persons licensed under [~~subsection (1) of this~~

~~section~~]R313-22-75(1) shall file an annual report with the [~~Bureau~~]Executive Secretary which shall identify the type and quantity of [~~each~~]products or materials into which radioactive material has been introduced during the reporting period; name and address of the person who owned or possessed the product and material, into which radioactive material has been introduced, at the time of introduction; the type and quantity of radionuclide introduced into [~~each such~~]the product or material; and the initial concentrations of the radionuclide in the product or material at time of transfer of the radioactive material by the licensee. If no transfers of radioactive material have been made pursuant to [~~subsection (1) of this section~~]R313-22-75(1) during the reporting period, the report shall so indicate. The report shall cover the year ending June 30, and shall be filed within thirty days thereafter.

(2) Licensing the distribution of radioactive material in exempt quantities.[~~*~~] Authority to transfer possession or control by the manufacturer, processor or producer of equipment, devices, commodities or other products containing byproduct material whose subsequent possession, use, transfer, and disposal by other persons who are exempted from regulatory requirements may be obtained only from the U.S. Nuclear Regulatory Commission, Washington, D.C. 20555.

[~~NOTE: * Authority to transfer possession or control by the manufacturer, processor or producer of any equipment, device, commodity or other product containing source material or byproduct material whose subsequent possession, use, transfer and disposal by all other persons who are exempted from regulatory requirements may be obtained only from the United States Nuclear Regulatory Commission, Washington, D.C. 20555.~~]

(a) An application for a specific license to distribute naturally occurring and accelerator-produced radioactive material (NARM) to persons exempted from these rules pursuant to R313-19-13(2)(b) will be approved if:

(i) the radioactive material is not contained in [~~any~~]a food, beverage, cosmetic, drug or other commodity designed for ingestion or inhalation by, or application to, a human being;

(ii) the radioactive material is in the form of processed chemical elements, compounds, or mixtures, tissue samples, bioassay samples, counting standards, plated or encapsulated sources, or similar substances, identified as radioactive and to be used for its radioactive properties, but is not incorporated into [~~any~~]a manufactured or assembled commodity, product, or device intended for commercial distribution; and

(iii) the applicant submits copies of prototype labels and brochures and the [~~Bureau~~]Executive Secretary approves [~~such~~]the labels and brochures;

(b) The license issued under [~~paragraph (2)(a) of this section~~]R313-22-75(2)(a) is subject to the following conditions:

(i) No more than ten exempt quantities shall be sold or transferred in [~~any~~]a single transaction. However, an exempt quantity may be composed of fractional parts of one or more of the exempt quantities provided the sum of the fractions shall not exceed unity.

(ii) [~~Each exempt quantity~~]Exempt quantities shall be separated and individually packaged. No more than ten [~~such~~]packaged exempt quantities shall be contained in any outer package for transfer to persons exempt pursuant to R313-19-13(2)(b). The outer package shall [~~be such that~~]not allow the dose rate at the external surface of the package [~~does not~~]to exceed 0.5 millirem (5.0 uSv) per hour.

(iii) The immediate container of [~~each~~]a quantity or separately packaged fractional quantity of radioactive material shall bear a durable, legible label which:

(A) identifies the radionuclide and the quantity of radioactivity; and

(B) bears the words "Radioactive Material."

(iv) In addition to the labeling information required by [~~item (2)(b)(iii) of this section~~]R313-22-75(2)(b)(iii), the label affixed to the immediate container, or an accompanying brochure, shall:

(A) state that the contents are exempt from Licensing State requirements;

(B) bear the words "Radioactive Material - Not for Human Use - Introduction into Foods, Beverages, Cosmetics, Drugs, or Medicinals, or into Products Manufactured for Commercial Distribution is Prohibited - Exempt Quantities Should Not Be Combined;" and

(C) set forth appropriate additional radiation safety precautions and instructions relating to the handling, use, storage and disposal of the radioactive material.

(c) [~~Each person~~]Persons licensed under [~~paragraph (2)(a) of this section~~]R313-22-75(2) shall maintain records identifying, by name and address, [~~each~~]persons to whom radioactive material is transferred for use under R313-19-13(2)(b) or the equivalent regulations of a Licensing State, and stating the kinds and quantities of radioactive material transferred. An annual summary report stating the total quantity of [~~each~~]radionuclides transferred under the specific license shall be filed with the [~~Bureau~~]Executive Secretary. [~~Each report~~]Reports shall cover the year ending June 30, and shall be filed within thirty days thereafter. If no transfers of radioactive material have been made pursuant to [~~subsection (2) of this section~~]R313-22-75(2) during the reporting period, the report shall so indicate.

(3) Licensing the incorporation of naturally occurring and accelerator-produced radioactive material (NARM) into gas and aerosol detectors. An application for a specific license authorizing the incorporation of NARM into gas and aerosol detectors to be distributed to persons exempt under R313-19-13(2)(c)(iii) will be approved if the application satisfies requirements equivalent to those contained in [~~Section 32.26 of 10 CFR Part 32~~]10 CFR 32.26. The maximum quantity of radium-226 in each device shall not exceed 0.1 microcurie (3.7 kBq).

(4) Licensing the manufacture and distribution of devices to persons generally licensed under R313-21-22(4).

(a) An application for a specific license to manufacture or distribute devices containing radioactive material, excluding special nuclear material, to persons generally licensed under R313-21-22(4) or equivalent regulations of the [~~United States~~]U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State will be approved if:

(i) the applicant satisfies the general requirements of R313-22-33;

(ii) the applicant submits sufficient information relating to the design, manufacture, prototype testing, quality control, labels, proposed uses, installation, servicing, leak testing, operating and safety instructions, and potential hazards of the device to provide reasonable assurance that:

(A) the device can be safely operated by persons not having training in radiological protection[~~;~~],

(B) under ordinary conditions of handling, storage and use of the device, the radioactive material contained in the device will not be released or inadvertently removed from the device, and it is unlikely that [~~any~~]a person will receive in [~~any~~]a period of one calendar quarter a dose in excess of ten percent of the limits specified in the table in R313-15-101(1)[~~;~~], and

(C) under accident conditions, [~~;~~]such as fire and explosion[~~;~~], associated with handling, storage and use of the device, it is unlikely that [~~any~~]a person would receive an external radiation dose or dose commitment in excess of the following organ doses[~~;~~]:

TABLE

Whole body; head and trunk; active blood-forming organs; gonads; or lens of eye	15 rems (150.0 mSv)
Hands and forearms; feet and ankles; localized areas of skin averaged over areas no larger than one square centimeter	200 rems (2.0 Sv)
Other organs	50 rems (500.0 mSv); and

(iii) each device bears a durable, legible, clearly visible label or labels approved by the [~~Bureau~~]Executive Secretary, which contain in a clearly identified and separate statement[~~;~~]:

(A) [~~Instructions~~]instructions and precautions necessary to assure safe installation, operation and servicing of the device; [~~(~~]documents such as operating and service manuals may be identified in the label and used to provide this information[~~)~~.],

(B) [~~The~~]the requirement, or lack of requirement, for leak testing, or for testing [~~any~~]an "on-off" mechanism and indicator, including the maximum time interval for testing, and the identification of radioactive material by [~~isotope~~]radionuclide, quantity of radioactivity, and date of determination of the quantity[~~.~~], and

(C) [~~The~~]the information called for in one of the following statements, as appropriate, in the same or substantially similar form[~~:~~]:

(I) "The receipt, possession, use and transfer of this device, Model No. _____, Serial No._____[*], are subject to a general license or the equivalent, and the regulations of the [~~United States~~]U.S. Nuclear Regulatory Commission or a state with which the [~~United States~~]U.S. Nuclear Regulatory Commission has entered into an agreement for the exercise of regulatory authority. This label shall be maintained on the device in a legible condition. Removal of this label is prohibited.[*]" The label shall be printed with the words "CAUTION -RADIOACTIVE MATERIAL" and the name of the manufacturer or distributor shall appear on the label. The model, serial number, and name of the manufacturer or distributor may be omitted from this label provided the information is elsewhere specified in labeling affixed to the device.

(II) "The receipt, possession, use and transfer of this device, Model No. _____, Serial No._____[*], are subject to a general license or the equivalent, and the regulations of a Licensing State. This label shall be maintained on the device in a legible condition. Removal of this label is prohibited.[*]" The label shall be printed with the words "CAUTION - RADIOACTIVE MATERIAL" and the name of the manufacturer or distributor shall appear on the label. The model, serial number, and name of the manufacturer or distributor may be omitted from this label provided the information is elsewhere specified in labeling affixed to the device.

[~~NOTE: *The model, serial number, and name of the manufacturer or distributor may be omitted from this label provided the information is elsewhere specified in labeling affixed to the device.~~]

(b) In the event the applicant desires that the device be required to be tested at intervals longer than six months, either for proper operation of the "on-off" mechanism and indicator, if any, or for leakage of radioactive material or for both, [~~he~~]the applicant shall include in [~~his~~]the application sufficient information to demonstrate that [~~such~~]a longer interval is justified by performance characteristics of the device or similar devices and by design features which have a significant bearing on the probability or consequences of leakage of radioactive material from the device or failure of the "on-off" mechanism and indicator. In determining the acceptable interval for the test for leakage of radioactive material, the [~~Bureau~~]Executive Secretary will consider information which includes, but is not limited to:

(i) primary containment, or [~~(~~]source capsule[~~)~~];

(ii) protection of primary containment;

(iii) method of sealing containment;

(iv) containment construction materials;

(v) form of contained radioactive material;

(vi) maximum temperature withstood during prototype tests;

(vii) maximum pressure withstood during prototype tests;

(viii) maximum quantity of contained radioactive material;

(ix) radiotoxicity of contained radioactive material; and

(x) operating experience with identical devices or similarly designed and constructed devices.

(c) In the event the applicant desires that the general licensee under R313-21-22(4), or under equivalent regulations of the [~~United States~~]U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State be authorized to install the device, collect the sample to be analyzed by a specific licensee for leakage of radioactive material, service the device, test the "on-off" mechanism and indicator, or remove the device from installation, [~~he~~]the applicant shall include in [~~his~~]the application written instructions to be followed by the general licensee, estimated calendar quarter doses associated with [~~such~~]this

activity or activities, and [~~bases~~]basis for [~~such~~]these estimates. The submitted information shall demonstrate that performance of [~~such~~]this activity or activities by an individual untrained in radiological protection, in addition to other handling, storage, and use of devices under the general license, is unlikely to cause that individual to receive a calendar quarter dose in excess of ten percent of the limits specified in the table in R313-15-101(1).

(d) [~~Each person~~]Persons licensed under [~~paragraph (4)(a) of this section~~]R313-22-75(4) to distribute devices to generally licensed persons shall:

(i) furnish a copy of the general license contained in R313-21-22(4) to each person to whom the person directly or through an intermediate person transfers radioactive material in a device for use pursuant to the general license contained in R313-21-22(4);

(ii) furnish a copy of the general license contained in the [~~United States~~]U.S. Nuclear Regulatory Commission's, Agreement State's, or Licensing State's regulation equivalent to R313-21-22(4), or alternatively, furnish a copy of the general license contained in R313-21-22(4) to each person to whom he directly or through an intermediate person transfers radioactive material in a device for use pursuant to the general license of the [~~United States~~]U.S. Nuclear Regulatory Commission, the Agreement State or the Licensing State. If a copy of the general license in R313-21-22(4) is furnished to such a person, it shall be accompanied by a note explaining that the use of the device is regulated by the [~~United States~~]U.S. Nuclear Regulatory Commission, Agreement State or Licensing State under requirements substantially the same as those in R313-21-22(4);

(iii) report to the [~~Bureau~~]Executive Secretary all transfers of such devices to persons for use under the general license in R313-21-22(4). [~~Such~~]The reports shall identify [~~each~~]the general licensee by name and address, an individual by name or position who may constitute a point of contact between the [~~Bureau~~]Executive Secretary and the general licensee, the type and model number of device transferred, and the quantity and type of radioactive material contained in the device. If one or more intermediate persons will temporarily possess the device at the intended place of use prior to its possession by the user, the report shall include identification of each intermediate person by name, address, contact, and relationship to the intended user. If no transfers have been made to persons generally licensed under R313-21-22(4) during the reporting period, the report shall so indicate. The report shall cover each calendar quarter and shall be filed within thirty days thereafter;

(iv) furnish reports to other agencies[~~of other states;~~].

(A) [~~report~~]Report to the [~~United States~~]U.S. Nuclear Regulatory Commission all transfers of [~~such~~]those devices to persons for use under the [~~United States~~]U.S. Nuclear Regulatory Commission general license in [~~Section 31.5 of 10 CFR Part 31;~~]10 CFR 31.5.

(B) [~~report~~]Report to the responsible State agency all transfers of devices manufactured and distributed pursuant to [~~subsection (4) of this section~~]R313-22-75(4) for use under a general license in that State's regulations equivalent to R313-21-22(4)[~~;~~].

(C) [~~Such~~]The reports shall identify each general licensee by name and address, an individual by name or position who may constitute a point of contact between the responsible agency and general licensee, the type and model of the device transferred, and the quantity and type of radioactive material contained in the device. If one or more intermediate persons will temporarily possess the device at the intended place of use prior to its possession by the user, the report shall include identification of each intermediate person by name, address, contact, and relationship to the intended user. The report shall be submitted within thirty days after the end of each calendar quarter in which [~~such~~]a device is transferred to the generally licensed person[~~;~~].

(D) If [~~no~~]transfers have not been made to [~~United States~~]U.S. Nuclear Regulatory Commission licensees during the reporting period, this information shall be reported to the [~~United States~~]U.S. Nuclear Regulatory Commission[~~;~~].

(E) If [~~no~~]transfers have not been made to general licensees within a particular state during the reporting period, this information shall be reported to the responsible [~~department or~~]state agency upon request of [~~the department or~~]that agency[~~;~~]; and

(v) [~~Keep~~]keep records showing the name, address and the point of contact for each general licensee to whom the person directly or through an intermediate

person transfers radioactive material in devices for use pursuant to the general license provided in R313-21-22(4), or equivalent regulations of the [~~United States~~]U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State. The records shall show the date of each transfer, the radionuclide and the quantity of radioactivity in each device transferred, the identity of[~~any~~] intermediate persons, and compliance with the report requirements of [~~paragraph (4)(d) of this section~~]R313-22-75(4).

(5) Special requirements for the manufacture, assembly or repair of luminous safety devices for use in aircraft. An application for a specific license to manufacture, assemble or repair luminous safety devices containing tritium or promethium-147 for use in aircraft for distribution to persons generally licensed under R313-21-22(5) will be approved [~~subject to the following conditions.~~] if:

(a) [~~The~~]the applicant satisfies the general requirements [~~specified in~~]of R313-22-33[~~.~~]; and

(b) [~~The~~]the applicant satisfies the requirements of [~~Sections 32.53,~~]10 CFR 32.53, 32.54, 32.55, 32.56, and 32.101[~~of 10 CFR Part 32~~], or their equivalent.

(6) Special requirements for license to manufacture calibration sources containing americium-241, plutonium or radium-226 for distribution to persons generally licensed under R313-21-22(7). An application for a specific license to manufacture calibration and reference sources containing americium-241, plutonium or radium-226 to persons generally licensed under R313-21-22(7) will be approved [~~subject to the following conditions~~]if:

(a) the applicant satisfies the general requirements of [~~R313-21-33~~]R313-22-33; and

(b) the applicant satisfies the requirements of [~~Sections 32.57, 32.58, 32.59, 32.102 of 10 CFR Part 32 and Section 70.39 of 10 CFR Part 70~~]10 CFR 32.57, 32.58, 32.59, 32.102 and 10 CFR 70.39, or their equivalent.

[~~(7) Manufacture and distribution of radioactive material for medical use under general license. In addition to requirements set forth in R313-22-33, a specific license authorizing the distribution of radioactive material for use by physicians under the general license in R313-21-22(8) will be issued if:~~

~~(a) the applicant submits evidence that the radioactive material is to be manufactured, labeled, and packaged in accordance with a new drug application which the Commissioner of Food and Drugs, Food and Drug Administration, has approved, or in accordance with a license for a biologic product issued by the Secretary, Department of Health, Education, and Welfare;~~

~~(b) one of the following statements, as appropriate, or a substantially similar statement which contains the information called for in one of the following statements, appears on the label affixed to the container or appears in the leaflet or brochure which accompanies the package:~~

~~(i) "This radioactive drug may be received, possessed, and used only by physicians licensed (to dispense drugs), in the practice of medicine. Its receipt, possession, use and transfer are subject to the regulations and a general license or its equivalent of the U.S. Nuclear Regulatory Commission or of a State with which the Commission has entered into an agreement for the exercise of regulatory authority." Typed or printed name of manufacturer.~~

~~(ii) "This radioactive drug may be received, possessed, and used only by physicians licensed (to dispense drugs) in the practice of medicine. Its receipt, possession, use and transfer are subject to the regulations and a general license or its equivalent of a Licensing State." Typed or printed name of manufacturer.~~]

[~~(8)~~](7) Manufacture and distribution of radioactive material for certain in vitro clinical or laboratory testing under general license. An application for a specific license to manufacture or distribute radioactive material for use under the general license of R313-21-22(8) will be approved if:

(a) the applicant satisfies the general requirements specified in R313-22-33;

(b) the radioactive material is to be prepared for distribution in prepackaged units of:

(i) iodine-125 in units not exceeding [~~10~~]ten microcuries (370.0 kBq) each;

(ii) iodine-131 in units not exceeding [~~10~~]ten microcuries (370.0 kBq)

each;

(iii) carbon-14 in units not exceeding [~~10~~]ten microcuries (370.0 kBq) each;

(iv) hydrogen-3 (tritium) in units not exceeding 50 microcuries (1.85 MBq) each;

(v) iron-59 in units not exceeding 20 microcuries (740.0 kBq) each;

(vi) cobalt-57 in units not exceeding [~~10~~]ten microcuries (370.0 kBq) each;

(vii) selenium-75 in units not exceeding [~~10~~]ten microcuries (370.0 kBq) each; or

(viii) mock [~~Iodine-125~~]iodine-125 in units not exceeding 0.05 microcurie (1.85 kBq) of iodine-129 and 0.005 microcurie (185.0 Bq) of americium-241 each[~~.~~];

(c) [~~Each~~]prepackaged units [~~bears~~]bear a durable, clearly visible label:

(i) [~~Identifying~~]identifying the radioactive contents as to chemical form and radionuclide, and indicating that the amount of radioactivity does not exceed [~~10~~]ten microcuries (370.0 kBq) of iodine-125, iodine-131, carbon-14, cobalt-57, or selenium-75; 50 microcuries (1.85 MBq) of hydrogen-3 (tritium); 20 microcuries (740.0 kBq) of iron-59; or Mock Iodine-125 in units not exceeding 0.05 microcuries (1.85 kBq) of iodine-129 and 0.005 microcurie (185.0 Bq) of americium-241 each[~~.~~]; and

(ii) [~~Displaying~~]displaying the radiation caution symbol described in R313-15-203(1)(a) and the words, "CAUTION, RADIOACTIVE MATERIAL", and "Not for Internal or External Use in Humans or Animals"[~~.~~];

(d) [~~One~~]one of the following statements, as appropriate, or a substantially similar statement which contains the information called for in one of the following statements, appears on a label affixed to each prepackaged unit or appears in a leaflet or brochure which accompanies the package[~~.~~]:

(i) "This radioactive material may be received, acquired, possessed and used only by physicians, veterinarians, clinical laboratories or hospitals and only for in vitro clinical or laboratory tests not involving internal or external administration of the material, or the radiation therefrom, to human beings or animals. Its receipt, acquisition, possession, use and transfer are subject to the regulations and a general license of the [~~United States~~]U.S. Nuclear Regulatory Commission or of a state with which the U.S. Nuclear Regulatory Commission has entered into an agreement for the exercise of regulatory authority." [~~Typed or printed~~]The name of manufacturer shall be printed on the label.

(ii) "This radioactive material may be received, acquired, possessed and used only by physicians, veterinarians, clinical laboratories or laboratory tests not involving internal or external administration of the material, or the radiation therefrom, to human beings or animals. Its receipt, acquisition, possession, use and transfer are subject to the regulations and a general license of a Licensing State." [~~Typed or printed~~]The name of manufacturer[~~.~~] shall be printed on the label; and

(e) [~~The~~]the label affixed to the unit, or the leaflet or brochure which accompanies the package, contains adequate information as to the precautions to be observed in handling and storing [~~such~~]radioactive material. In the case of the Mock Iodine-125 reference or calibration source, the information accompanying the source must also contain directions to the licensee regarding the waste disposal requirements set out in R313-15-301[~~of these rules~~].

[~~(9)~~](8) Licensing the manufacture and distribution of ice detection devices. An application for a specific license to manufacture and distribute ice detection devices to persons generally licensed under R313-21-22(9) will be approved [~~subject to the following conditions~~]if:

(a) the applicant satisfies the general requirements of R313-22-33; and

(b) the criteria of [~~Sections~~]10 CFR 32.61, 32.62, 32.103 [~~of 10 CFR Part 32~~]are met.

[~~(10)~~](9) Manufacture and distribution of radiopharmaceuticals containing radioactive material for medical use under group licenses. An application for a specific license to manufacture and distribute radiopharmaceuticals containing radioactive material for use by persons licensed pursuant to R313-32-18[~~(3)~~] for the uses listed in R313-32-100, R313-32-200 and R313-32-300 will be approved if:

(a) the applicant satisfies the general requirements specified in R313-22-

33[~~, of this chapter~~];

(b) the applicant submits evidence that:

(i) the radiopharmaceutical containing radioactive material will be manufactured, labeled and packaged in accordance with the Federal Food, Drug and Cosmetic Act or the Public Health Service Act, such as a new drug application (NDA) approved by the [~~United States~~]U.S. Food and Drug Administration (FDA), [~~a biologic product license issued by FDA~~]or a "Notice of Claimed Investigational Exemption for a New Drug" (IND) that has been accepted by the FDA[~~,~~]; or

(ii) The manufacture[~~, compounding~~] and distribution of the radiopharmaceutical containing radioactive material is not subject to the Federal Food, Drug and Cosmetic Act and the Public Health Service Act[~~,~~];

(c) [~~The~~]the applicant submits information on the radionuclide, chemical and physical form, packaging including maximum activity per package, and shielding provided by the packaging of the radioactive material which is appropriate for safe handling and storage of radiopharmaceuticals by group licensees[~~,~~]; and

(d) [~~The~~]the label affixed to each package of the radiopharmaceutical contains information on the radionuclide, quantity and date of assay, and the label affixed to [~~each~~]the package, or the leaflet or brochure which accompanies each package, contains a statement that the radiopharmaceutical is licensed by the [~~Bureau~~]Executive Secretary for distribution to persons licensed pursuant to R313-32-18[~~(3) and~~]for the uses listed in R313-32-100, R313-32-200 and R313-32-300,[~~as appropriate,~~] or under equivalent regulations of the [~~United States~~]U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State. The labels, leaflets or brochures required by [~~subsection (9) of this section~~]R313-22-75(9) are in addition to the labeling required by the Food and Drug Administration (FDA) and they may be separate from or, with the approval of FDA, may be combined with the labeling required by FDA.

[~~(11)~~](10) Manufacture and distribution of generators or reagent kits for preparation of radiopharmaceuticals[~~containing radioactive material*. An application for a specific license to manufacture and distribute generators or reagent kits containing radioactive material for preparation of radiopharmaceuticals by persons licensed pursuant to R313-32-18(3) for the uses listed in R313-32-100, R313-32-200 and R313-32-300 will be approved if:~~]

(a) An application for a specific license to manufacture and distribute generators or reagent kits containing radioactive material for preparation of radiopharmaceuticals by persons licensed pursuant to R313-32-18 for the uses listed in R313-32-200 will be approved if:

[~~(a)~~](i) the applicant satisfies the general requirements specified in R313-22-33;

[~~(b)~~](ii) the applicant submits evidence that:

[~~(i)~~](A) the generator or reagent kit is to be manufactured, labeled and packaged in accordance with the Federal Food, Drug and Cosmetic Act or the Public Health Service Act, such as a new drug application (NDA) approved by the Food and Drug Administration (FDA),[~~a biologic product license issued by FDA,~~] or a "Notice of Claimed Investigational Exemption for a New Drug" (IND) that has been accepted by the FDA[~~,~~], or

[~~(ii)~~](B) the manufacture and distribution of the generator or reagent kit are not subject to the Federal Food, Drug and Cosmetic Act and the Public Health Service Act;

[~~(c)~~](iii) the applicant submits information on the radionuclide, chemical and physical form, packaging including maximum activity per package, and shielding provided by the packaging of the radioactive material contained in the generator or reagent kit;

[~~(d)~~](iv) the label affixed to the generator or reagent kit contains information on the radionuclide, quantity, and date of assay; and

[~~(e)~~](v) the label affixed to the generator or reagent kit, or the leaflet or brochure which accompanies the generator or reagent kit[~~,~~], contains:

[~~(i)~~](A) adequate information, from a radiation safety standpoint, on the procedures to be followed and the equipment and shielding to be used in eluting the generator or processing radioactive material with the reagent kit[~~,~~], and

[~~(ii)~~](B) a statement that this generator or reagent kit, [~~,~~]as appropriate[~~,~~], is approved for use by persons licensed by the [~~Bureau~~]Executive Secretary pursuant to R313-32-18[~~(3)~~] and R313-32-200, or under equivalent

regulations of the [~~United States~~]U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State. The labels, leaflets or brochures required by [~~subsection (10) of this section~~]R313-22-75(10) are in addition to the labeling required by the Food and Drug Administration (FDA) and they may be separate from or, with the approval of FDA, may be combined with the labeling required by FDA[~~,~~].

(b) Manufacturers of reagent kits that do not contain radioactive material who desire to have their reagent kits approved by the Executive Secretary for use by persons licensed pursuant to R313-32-18 and R313-32-200 shall submit the pertinent information specified in R313-22-75(10). The Department does not regulate the manufacture and distribution of reagent kits that do not contain radioactive material, but it does regulate the use of reagent kits for the preparation of radiopharmaceuticals containing radioactive material as part of its licensing and regulation of the users of radioactive material.

[~~NOTE: *Although the Bureau does not regulate the manufacture and distribution of reagent kits that do not contain radioactive material, it does regulate the use of such reagent kits for the preparation of radiopharmaceuticals containing radioactive material as part of its licensing and regulation of the users of radioactive material. Any manufacturer of reagent kits that do not contain radioactive material who desires to have his reagent kits approved by the Bureau for use by persons licensed pursuant to R313-32-18(3) and R313-32-200 shall submit the pertinent information specified in subsection (10) of this Section.~~]

[~~(12)~~](11) Manufacture and distribution of sources or devices containing radioactive material for medical use. An application for a specific license to manufacture and distribute sources and devices containing radioactive material to persons licensed pursuant to R313-32-18[~~(3)~~] for use as a calibration or reference source or for the uses listed in R313-32-400 and R313-32-500 will be approved if:

(a) the applicant satisfies the general requirements in R313-22-33[~~of this chapter~~];

(b) the applicant submits sufficient information regarding each type of source or device pertinent to an evaluation of its radiation safety, including:

(i) the radioactive material contained, its chemical and physical form and amount[~~,~~],

(ii) details of design and construction of the source or device[~~,~~],

(iii) procedures for, and results of, prototype tests to demonstrate that the source or device will maintain its integrity under stresses likely to be encountered in normal use and accidents[~~,~~],

(iv) for devices containing radioactive material, the radiation profile of a prototype device[~~,~~],

(v) details of quality control procedures to assure that production sources and devices meet the standards of the design and prototype tests[~~,~~],

(vi) procedures and standards for calibrating sources and devices[~~,~~],

(vii) legend and methods for labeling sources and devices as to their radioactive content[~~,~~], and

(viii) instructions for handling and storing the source or device from the radiation safety standpoint, these instructions are to be included on a durable label attached to the source or device or attached to a permanent storage container for the source or device[~~: PROVIDED, That~~]; provided that instructions which are too lengthy for [~~such~~]a label may be summarized on the label and printed in detail on a brochure which is referenced on the label;

(c) the label affixed to the source or device, or to the permanent storage container for the source or device, contains information on the radionuclide, quantity and date of assay, and a statement that the [~~named~~]source or device is licensed by the [~~Bureau~~]Executive Secretary for distribution to persons licensed pursuant to R313-32-18[~~(3) and~~], R313-32-400, and R313-32-500 or under equivalent regulations of the [~~United States~~]U.S. Nuclear Regulatory Commission, an Agreement State or a Licensing State[~~: PROVIDED, That such~~]; provided that labeling for sources which do not require long term storage[~~(e.g., gold 198 seeds)~~] may be on a leaflet or brochure which accompanies the source;

(d) in the event the applicant desires that the source or device be required to be tested for leakage of radioactive material at intervals longer than six months, the applicant shall include in the application sufficient

information to demonstrate that [~~such~~]a longer interval is justified by performance characteristics of the source or device or similar sources or devices and by design features that have a significant bearing on the probability or consequences of leakage of radioactive material from the source; and

(e) in determining the acceptable interval for test of leakage of radioactive material, the [~~Bureau~~]Executive Secretary shall consider information that includes, but is not limited to:

(i) primary containment or [~~(~~]source capsule[~~)~~],

(ii) protection of primary containment[~~,~~],

(iii) method of sealing containment[~~,~~],

(iv) containment construction materials[~~,~~],

(v) form of contained radioactive material[~~,~~],

(vi) maximum temperature withstood during prototype tests[~~,~~],

(vii) maximum pressure withstood during prototype tests[~~,~~],

(viii) maximum quantity of contained radioactive material[~~,~~],

(ix) radiotoxicity of contained radioactive material[~~,~~], and

(x) operating experience with identical sources or devices or similarly designed and constructed sources or devices.

[~~(13)~~](12) Requirements for license to manufacture and distribute industrial products containing depleted uranium for mass-volume applications.

(a) An application for a specific license to manufacture industrial products and devices containing depleted uranium for use pursuant to R313-21-21(4) or equivalent regulations of the [~~United States~~]U.S. Nuclear Regulatory Commission or an Agreement State will be approved if:

(i) the applicant satisfies the general requirements specified in R313-22-33;

(ii) the applicant submits sufficient information relating to the design, manufacture, prototype testing, quality control procedures, labeling or marking, proposed uses and potential hazards of the industrial product or device to provide reasonable assurance that possession, use or transfer of the depleted uranium in the product or device is not likely to cause [~~any~~]an individual to receive in [~~any~~]a period of one calendar quarter a radiation dose in excess of ten percent of the limits specified in R313-15-101(1); and

(iii) the applicant submits sufficient information regarding the industrial product or device and the presence of depleted uranium for a mass-volume application in the product or device to provide reasonable assurance that unique benefits will accrue to the public because of the usefulness of the product or device.

(b) In the case of an industrial product or device whose unique benefits are questionable, the [~~Bureau~~]Executive Secretary will approve an application for a specific license under [~~subsection (13) of this section~~]R313-22-75(12) only if the product or device is found to combine a high degree of utility and low probability of uncontrolled disposal and dispersal of significant quantities of depleted uranium into the environment.

(c) The [~~Bureau~~]Executive Secretary may deny [~~any~~]an application for a specific license under [~~subsection (13) of this section~~]R313-22-75(12) if the end use[~~(s)~~] of the industrial product or device cannot be reasonably foreseen.

(d) [~~Each person~~]Persons licensed pursuant to [~~paragraph (13)(a) of this section~~]R313-22-75(12)(a) shall:

(i) maintain the level of quality control required by the license in the manufacture of the industrial product or device, and in the installation of the depleted uranium into the product or device;

(ii) label or mark each unit to:

(A) identify the manufacturer of the product or device and the number of the license under which the product or device was manufactured, the fact that the product or device contains depleted uranium, and the quantity of depleted uranium in each product or device; and

(B) state that the receipt, possession, use and transfer of the product or device are subject to a general license or the equivalent and the regulations of the [~~United States~~]U.S. Nuclear Regulatory Commission or [~~of~~]an Agreement State[~~,~~];

(iii) assure that the uranium before being installed in each product or device has been impressed with the following legend clearly legible through a plating or other covering: "Depleted Uranium";

(iv) furnish to each person to whom depleted uranium in a product or device is transferred for use pursuant to the general license contained in R313-21-21(4) or its equivalent:

(A) a copy of the general license contained in R313-21-21(4) and a copy of form [~~DRC-12;~~]DRC-12; or

(B) a copy of the general license contained in the [~~United States~~]U.S. Nuclear Regulatory Commission's or Agreement State's regulation equivalent to R313-21-21(4) and a copy of the [~~United States~~]U.S. Nuclear Regulatory Commission's or Agreement State's certificate, or alternatively, furnish a copy of the general license contained in R313-21-21(4) and a copy of form [~~DRC-12~~]DRC-12 with a note explaining that use of the product or device is regulated by the [~~United States~~]U.S. Nuclear Regulatory Commission or an Agreement State under requirements substantially the same as those in R313-21-21(4)[~~.~~];

(v) [~~Report~~]report to the [~~Bureau~~]Executive Secretary all transfers of industrial products or devices to persons for use under the general license in R313-21-21(4). [~~Such~~]The report shall identify each general licensee by name and address, an individual by name or position who may constitute a point of contact between the [~~Bureau~~]Executive Secretary and the general licensee, the type and model number of device transferred, and the quantity of depleted uranium contained in the product or device. The report shall be submitted within thirty days after the end of [~~each~~]the calendar quarter in which [~~such a~~]the product or device is transferred to the generally licensed person. If no transfers have been made to persons generally licensed under R313-21-21(4) during the reporting period, the report shall so indicate[~~.~~];

(vi) [~~Provide~~]provide certain other reports as follows:

(A) report to the [~~United States~~]U.S. Nuclear Regulatory Commission all transfers of industrial products or devices to persons for use under the [~~United States~~]U.S. Nuclear Regulatory Commission general license in [~~Section 40.25 of 10 CFR Part 40~~]10 CFR 40.25;

(B) report to the responsible state agency all transfers of devices manufactured and distributed pursuant to [~~subsection (12) of this section~~]R313-22-75(12) for use under a general license in that state's regulations equivalent to [~~R313-21-030(4).~~]R313-21-21(4),

(C) [~~Such~~]reports shall identify each general licensee by name and address, an individual by name or position who may constitute a point of contact between the agency and the general licensee, the type and model number of the device transferred, and the quantity of depleted uranium contained in the product or device. The report shall be submitted within thirty days after the end of each calendar quarter in which [~~such~~]a product or device is transferred to the generally licensed person[~~.~~],

(D) [~~If~~]if no transfers have been made to [~~United States~~]U.S. Nuclear Regulatory Commission licensees during the reporting period, this information shall be reported to the [~~United States~~]U.S. Nuclear Regulatory Commission[~~.~~], and

(E) [~~If~~]if no transfers have been made to general licensees within a particular Agreement State during the reporting.period, this information shall be reported to the responsible Agreement State agency[~~.~~] upon the request of that agency; and

(vii) [~~Records~~]records shall be kept showing the name, address and point of contact for each general licensee to whom the person transfers depleted uranium in industrial products or devices for use pursuant to the general license provided in [~~R313-21-030(4)~~]R313-21-21(4) or equivalent regulations of the [~~United States~~]U.S. Nuclear Regulatory Commission or [~~of~~]an Agreement State. The records shall be maintained for a period of two years and shall show the date of each transfer, the quantity of depleted uranium in [~~each~~]the product or device transferred, and compliance with the report requirements of [~~this section~~]R313-22-75(12).

R313-22-90. Quantities of Radioactive Materials Requiring Consideration of the Need for an Emergency Plan for Responding to a Release. Refer to R313-22-32(8).

Release	Quantity

Radioactive Material(1)	Fraction	(curies)
Actinium-228	0.001	4,000
Americium-241	.001	2
Americium-242	.001	2
Americium-243	.001	2
Antimony-124	.01	4,000
Antimony-126	.01	6,000
Barium-133	.01	10,000
Barium-140	.01	30,000
Bismuth-207	.01	5,000
Bismuth-210	.01	600
Cadmium-109	.01	1,000
Cadmium-113	.01	80
Calcium-45	.01	20,000
Californium-252	.001	9 (20 mg)
Carbon-14	.01	50,000
	Non CO	
Cerium-141	.01	10,000
Cerium-144	.01	300
Cesium-134	.01	2,000
Cesium-137	.01	3,000
Chlorine-36	.5	100
Chromium-51	.01	300,000
Cobalt-60	.001	5,000
Copper-64	.01	200,000
Curium-242	.001	60
Curium-243	.001	3
Curium-244	.001	4
Curium-245	.001	2
Europium-152	.01	500
Europium-154	.01	400
Europium-155	.01	3,000
Germanium-68	.01	2,000
Gadolinium-153	.01	5,000
Gold-198	.01	30,000
Hafnium-172	.01	400
Hafnium-181	.01	7,000
Holmium-166m	.01	100
Hydrogen-3	.5	20,000
Iodine-125	.5	10
Iodine-131	.5	10
Indium-114m	.01	1,000
Iridium-192	.001	40,000
Iron-55	.01	40,000
Iron-59	.01	7,000
Krypton-85	1.0	6,000,000
Lead-210	.01	8
Manganese-56	.01	60,000
Mercury-203	.01	10,000
Molybdenum-99	.01	30,000
Neptunium-237	.001	2
Nickel-63	.01	20,000
Niobium-94	.01	300
Phosphorus-32	.5	100
Phosphorus-33	.5	1,000
Polonium-210	.01	10
Potassium-42	.01	9,000
Promethium-145	.01	4,000
Promethium-147	.01	4,000
Ruthenium-106	.01	200
Samarium-151	.01	4,000
Scandium-46	.01	3,000
Selenium-75	.01	10,000
Silver-110m	.01	1,000

Sodium-22	.01	9,000
Sodium-24	.01	10,000
Strontium-89	.01	3,000
Strontium-90	.01	90
Sulfur-35	.5	900
Technetium-99	.01	10,000
Technetium-99m	.01	400,000
Tellurium-127m	.01	5,000
Tellurium-129m	.01	5,000
Terbium-160	.01	4,000
Thulium-170	.01	4,000
Tin-113	.01	10,000
Tin-123	.01	3,000
Tin-126	.01	1,000
Titanium-44	.01	100
Vanadium-48	.01	7,000
Xenon-133	1.0	900,000
Yttrium-91	.01	2,000
Zinc-65	.01	5,000
Zirconium-93	.01	400
Zirconium-95	.01	5,000
Any other beta-gamma emitter	.01	10,000
Mixed fission products	.01	1,000
Mixed corrosion products	.01	10,000
Contaminated equipment, beta-gamma	.001	10,000
Irradiated material, any form other than solid noncombustible	.01	1,000
Irradiated material, solid noncombustible	.001	10,000
Mixed radioactive waste, beta-gamma	.01	1,000
Packaged mixed waste, beta-gamma(2)	.001	10,000
Any other alpha emitter	.001	2
Contaminated equipment, alpha	.0001	20
Packaged waste, alpha(2)	.0001	20
Combinations of radioactive materials listed above(1)	-----	-----

(1) For combinations of radioactive materials, consideration of the need for an emergency plan is required if the sum of the ratios of the quantity of each radioactive material authorized to the quantity listed for that material in R313-22-90 exceeds one.
(2) Waste packaged in Type B containers does not require an emergency plan.

R313-22-100. Limits for Broad Licenses. [~~(See also~~]Refer to R313-22-50[~~)~~].

TABLE

RADIOACTIVE MATERIAL	COLUMN I CURIES	COLUMN II CURIES
Antimony-122	1	0.01
Antimony-124	1	0.01
Antimony-125	1	0.01
Arsenic-73	10	0.1
Arsenic-74	1	0.01
Arsenic-76	1	0.01
Arsenic-77	10	0.1
Barium-131	10	0.1
Barium-140	1	0.01
Beryllium-7	10	0.1
Bismuth-210	0.1	0.001
Bromine-82	10	0.1
Cadmium-109	1	0.01

Cadmium-115m	1	0.01
Cadmium-115	10	0.1
Calcium-45	1	0.01
Calcium-47	10	0.1
Carbon-14	100	1
Cerium-141	10	0.1
Cerium-143	10	0.1
Cerium-144	0.1	0.001
Cesium-131	100	1
Cesium-134m	100	1
Cesium-134	0.1	0.001
Cesium-135	1	0.01
Cesium-136	10	0.1
Cesium-137	0.1	0.001
Chlorine-36	1	0.01
Chlorine-38	100	1
Chromium-51	100	1
Cobalt-57	10	0.1
Cobalt-58m	100	1
Cobalt-58	1	0.01
Cobalt-60	0.1	0.001
Copper-64	10	0.1
Dysprosium-165	100	1
Dysprosium-166	10	0.1
Erbium-169	10	0.1
Erbium-171	10	0.1
Europium-152 (9.2h)	10	0.1
Europium-152 (13y)	0.1	0.001
Europium-154	0.1	0.001
Europium-155	1	0.01
Fluorine-18	100	1
Gadolinium-153	1	0.01
Gadolinium-159	10	0.1
Gallium-72	10	0.1
Germanium-71	100	1
Gold-198	10	0.1
Gold-199	10	0.1
Hafnium-181	1	0.01
Holmium-166	10	0.1
Hydrogen-3	100	1
Indium-113m	100	1
Indium-114m	1	0.01
Indium-115m	100	1
Indium-115	1	0.01
Iodine-125	0.1	0.001
Iodine-126	0.1	0,001
Iodine-129	0.1	0.01
Iodine-131	0.1	0.001
Iodine-132	10	0.1
Iodine-133	1	0.01
Iodine-134	10	0.1
Iodine-135	1	0.01
Iridium-192	1	0.01
Iridium-194	10	0.1
Iron-55	10	0.1
Iron-59	1	0.01
Krypton-85	100	1
Krypton-87	10	0.1
Lanthanum-140	1	0.01
Lutetium-177	10	0.1
Manganese-52	1	0.01
Manganese-54	1	0.01
Manganese-56	10	0.1
Mercury-197m	10	0.1

Mercury-197	10	0.1
Mercury-203	1	0.01
Molybdenum-99	10	0.1
Neodymium-147	10	0.1
Neodymium-149	10	0.1
Nickel-59	10	0.1
Nickel-63	1	0.01
Nickel-65	10	0.1
Niobium-93m	1	0.01
Niobium-95	1	0.01
Niobium-97	100	1
Osmium-185	1	0.01
Osmium-191m	100	1
Osmium-191	10	0.1
Osmium-193	10	0.1
Palladium-103	10	0.1
Palladium-109	10	0.1
Phosphorus-32	1	0.01
Platinum-191	10	0.1
Platinum-193m	100	1
Platinum-193	10	0.1
Platinum-197m	100	1
Platinum-197	10	0.1
Polonium-210	0.01	0.0001
Potassium-42	1	0.01
Praseodymium-142	10	0.1
Praseodymium-143	10	0.1
Promethium-147	1	0.01
Promethium-149	10	0.1
Radium-226	0.01	0.0001
Rhenium-186	10	0.1
Rhenium-188	10	0.1
Rhodium-103m	1,000	10
Rhodium-105	10	0.1
Rubidium-86	1	0.01
Rubidium-87	1	0.01
Ruthenium-97	100	1
Ruthenium-103	1	0.01
Ruthenium-105	10	0.1
Ruthenium-106	0.1	0.001
Samarium-151	1	0.01
Samarium-153	10	0.1
Scandium-46	1	0.01
Scandium-47	10	0.1
Scandium-48	1	0.01
Selenium-75	1	0,01
Silicon-31	10	0.1
Silver-105	1	0.01
Silver-110m	0.1	0.001
Silver-111	10	0.1
Sodium-22	0.1	0.001
Sodium-24	1	0.01
Strontium-85m	1,000	10
Strontium-85	1	0.01
Strontium-89	1	0.01
Strontium-90	0.01	0.0001
Strontium-91	10	0.1
Strontium-92	10	0.1
Sulphur-35	10	0.1
Tantalum-182	1	0.01
Technetium-96	10	0.1
Technetium-97m	10	0.1
Technetium-97	10	0.1
Technetium-99m	100	1

Technetium-99	1	0.01
Tellurium-125m	1	0.01
Tellurium-127m	1	0.01
Tellurium-127	10	0.1
Tellurium-129m	1	0.01
Tellurium-129	100	1
Tellurium-131m	10	0.1
Tellurium-132	1	0.01
Terbium-160	1	0.01
Thallium-200	10	0.1
Thallium-201	10	0.1
Thallium-202	10	0.1
Thallium-204	1	0.01
Thulium-170	1	0.01
Thulium-171	1	0.01
Tin-113	1	0.01
Tin-125	1	0.01
Tungsten-181	1	0.01
Tungsten-185	1	0.01
Tungsten-187	10	0.1
Vanadium-48	1	0.01
Xenon-131m	1,000	10
Xenon-133	100	1
Xenon-135	100	1
Ytterbium-175	10	0.1
Yttrium-90	1	0.01
Yttrium-91	1	0.01
Yttrium-92	10	0.1
Yttrium-93	1	0.01
Zinc-65	1	0.01
Zinc-69m	10	0.1
Zinc-69	100	1
Zirconium-93	1	0.01
Zirconium-95	1	0.01
Zirconium-97	1	0.01
Any radioactive material other than source material, special nuclear material, or alpha-emitting radioactive material not listed above	0.1	0.001

~~[NOTE: To convert curies (Ci) to SI units of gigabecquerels (GBq), multiply the above values by 37.]~~

R313-22-210. Registration of Product Information.

(1) [~~Any manufacturer~~]Manufacturers or initial distributors of a sealed source or device containing a sealed source whose product is intended for use under a specific license may submit a request to the [~~Bureau~~]Executive Secretary for evaluation of radiation safety information about its product for its registration.

(2) The request for review must be sent to the [~~Bureau of Radiation Control, P.O. Box 16690, Salt Lake city, Utah 84116-0690~~]Executive Secretary of the Radiation Control Board, P.O. Box 144850, Salt Lake City, Utah 84114-4850.

(3) The request for review of a sealed source or a device must include sufficient information about the design, manufacture, prototype testing, quality control program, labeling, proposed uses and leak testing and, for a device, the request must also include sufficient information about installation, service and maintenance, operating and safety instructions, and its potential hazards, to provide reasonable assurance that the radiation safety properties of the source or device are adequate to protect health and minimize danger to life and property.

(4) The [~~Bureau~~]Executive Secretary normally evaluates a sealed source or a device using radiation safety criteria in accepted industry standards. If these standards and criteria do not readily apply to a particular case, the

[~~Bureau~~]Executive Secretary formulates reasonable standards and criteria with the help of the manufacturer or distributor. The [~~Bureau~~]Executive Secretary shall use criteria and standards sufficient to ensure that the radiation safety properties of the device or sealed source are adequate to protect health and minimize danger to life and property.

(5) After completion of the evaluation, the [~~Bureau~~]Executive Secretary issues a certificate of registration to the person making the request. The certificate of registration acknowledges the availability of the submitted information for inclusion in an application for a specific license proposing use of the product.

(6) The person submitting the request for evaluation and registration of safety information about the product shall manufacture and distribute the product in accordance with:

(a) the statements and representations, including quality control program, contained in the request; and

(b) the provisions of the registration certificate.

KEY: radioactive, radioactive material
[~~1989~~]1993 **[~~26-1-29~~]19-3-104**
19-3-108

State of Utah
Administrative Rule Analysis
Notice of Proposed Rule/Change

D.A.R. FILE NUMBER:

CODE NUMBER
AGENCY - RULE - SECTION
R 313 - 22 -

Division of Administrative Rules
State Archives Building, State Capitol
Salt Lake City, Utah 84114
Telephone 538-3011

Department: Environmental Quality
Agency: Radiation Control
Address: 168 N 1950 W
Salt Lake City UT 84116
Contact Person: Craig Jones
Telephone: 536-4250

1. CODE TITLE OF RULE OR SECTION

Specific Licenses

2. REASON FOR AND SUMMARY OF RULE OR CHANGE

Many of the changes are the result of an overall review of the Utah Radiation Control Rules. The primary emphasis is to add clarity and reduce vagueness. Specific requirements for a decommissioning funding plan are detailed in R313-22-32(7) and R313-22-35, while specific requirements for emergency plans are detailed in R313-22-32(8). These rules are needed to maintain a radiation control program compatible with the Nuclear Regulatory Commission's program. Requirements for expiration of licenses are added to R313-22-36. These changes are also consistent with federal regulations.

3. COST OR SAVINGS IMPACT OF RULE - UCA 63-46a-4(3)

STATE BUDGET: State and local agencies must make a statement indicating that funds for decommissioning will be obtained when necessary. Estimates indicate that less than six licensees may need decommissioning financial assurance in amounts from $75,000 to $750,000. Licensees may amend a license so that they are not subject to the decommissioning funding requirements.

LOCAL GOV'T:

PUBLIC:

4. TYPE OF NOTICE

☒ PROPOSED RULE (☐ NEW ☐ AMEND ☐ REPEAL)
☐ CHANGE IN PROPOSED RULE (CHANGES PROPOSED RULE FILE NUMBER _____)
☐ 120-DAY RULE - UCA 63-46a-7
☐ FIVE-YEAR REVIEW / CONTINUATION

5. JUSTIFICATION FOR 120-DAY RULE CHECKED ABOVE - UCA 63-46a-7(1)

6. ☒ RULE AUTHORIZED BY STATE CODE / CONSTITUTION (CITATION): 19-3-104 and 19-3-113
☐ RULE REQUIRED BY FEDERAL MANDATE (U.S. CODE, CFR, OR FED. REGISTER CITATION):

7. PUBLIC MAY PARTICIPATE IN RULEMAKING BY: (REQUIRED ONLY FOR PROPOSED RULES)
WRITTEN OR ORAL COMMENT UNTIL: 07/15/93
PUBLIC HEARING (MAY BE OPTIONAL) DATE: PLACE: TIME:
NOTE: PUBLIC MAY REQUEST HEARING IN ACCORDANCE WITH UCA 63-46a-5(2)(b)

THIS RULE/CHANGE MAY BECOME EFFECTIVE ON:
07/16/93 8-293

8. INDEXING INFORMATION

AGENCY NOTE: TEXT MUST BE IN CODE FORMAT

STATE STATUTE CITATION(S): 19-3-104 and 19-3-113
KEY WORD(S): radioactive, radioactive material

THE FULL TEXT OF ALL PROPOSED ADMINISTRATIVE RULES OR RULE CHANGES IS PUBLISHED IN THE UTAH STATE BULLETIN UNLESS EXCLUDED BECAUSE OF LENGTH AND SPACE LIMITATION. THE FULL TEXT MAY BE INSPECTED AT THE AGENCY (ADDRESS ABOVE) OR DIVISION OF ADMINISTRATIVE RULES.

9. AUTHORIZATION

Larry F. Anderson, Executive Secretary 5/27/93
AGENCY HEAD OR DESIGNEE DATE

Utah Radiation Control Board
AGENCY

SEND WHITE & YELLOW TO D.A.R., YELLOW WILL BE RETURNED TO AGENCY

10. DIVISION OF ADMINISTRATIVE RULES

RECEIVED BY: DATE: TIME:
120-DAY RULE EFFECTIVE: LAPSES:
☐ TOO LONG TO PRINT PAGES:

12/90

56 FR 64980
11/14/94

R313. Environmental Quality, Radiation Control.
R313-36. Special Requirements for Industrial Radiographic Operations.
R313-36-1. Purpose and Scope.

The rules in [~~this chapter~~]R313-36 prescribe requirements for the issuance of licenses and establish radiation safety requirements for persons utilizing sources of radiation for industrial radiography. The requirements of [~~this chapter~~]R313-36 are in addition to, and not in substitution for, the other requirements of these rules. The rules in [~~this chapter~~]R313-36 apply to all licensees or registrants who use sources of radiation for industrial radiography. Except for those rules of [~~this chapter~~]R313-36 clearly applicable only to sealed radioactive sources, both radiation machines and sealed radioactive sources are covered by [~~this chapter~~]R313-36.

R313-36-2. Definitions.

As used in [~~this chapter~~]R313-36:

(1) "Cabinet radiography" means industrial radiography employing radiation machines conducted in an enclosure or cabinet so shielded that every exterior location meets the conditions specified in [~~R313-15-105 of these rules~~]R313-15-301.

(2) "Cabinet x-ray system" means an x-ray system with the x-ray tube installed in an enclosure (hereinafter termed "cabinet") which, independently of existing architectural structure 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 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.

(3) "Collimator" means a device used to limit the size, shape and direction of the primary radiation beam.

(4) "Enclosed radiography" means industrial radiography employing radiation machines conducted in an enclosed cabinet or room and includes cabinet radiography and shielded room radiography.

(5) "Industrial radiography" means the examination of the macroscopic structure of materials by nondestructive methods utilizing sources of radiation. Industrial radiography as used in [~~this chapter~~]R313-36 does not include well logging operations.

(6) "Permanent radiographic installation" means a shielded installation or structure designed or intended for radiography employing a radiographic exposure device and in which radiography is regularly performed.

(7) "Personal supervision" means supervision by a radiographer such that the radiographer is physically present at the radiography site and in such proximity that communication can be maintained and immediate assistance given as required. When a radiographer's assistant is using or handling sources of radiation, the radiographer must maintain direct surveillance.

(8) "Radiographer" means any individual who performs or personally supervises industrial radiographic operations and who is responsible to the licensee for assuring compliance with the requirements of these rules and all license conditions.

(9) "Radiographer's assistant" means any individual who, under the personal supervision of a radiographer, uses sources of radiation, related handling tools, or radiation survey instruments in industrial radiography.

(10) "Radiographer instructor" means any individual who has been authorized by the [~~Bureau~~]Executive Secretary to provide instruction to radiographer assistant in accordance with these rules.

(11) "Radiographic exposure device" means any instrument containing a sealed source fastened or contained therein, in which the sealed source or shielding thereof may be moved, or otherwise changed, from a shielded to unshielded position for purposes of making a radiographic exposure.

(12) "Residential location" means any area where structures in which people lodge or live are located, and the grounds on which such structures are located including, but not limited to, houses, apartments, condominiums, and garages.

(13) "Shielded-room radiography" means industrial radiography conducted in a room so shielded that radiation levels at every location on the exterior meet the limitations specified in these rules.

(14) "Storage area" means any location, facility, or vehicle which is used to store, to transport, or to secure a radiographic exposure device, a storage container, or a sealed source when it is not in use and which is locked or has a physical barrier to prevent accidental exposure, tampering with, or unauthorized removal of the device, container, or source.

(15) "Transport container" means a package that is designed to provide radiation safety and security when sealed sources are transported and meets all application requirements of the U.S. Department of Transportation.

R313-36-11. License Issuance.

(1) A specific license for use of sealed sources in industrial radiography will be issued if all of the following are complied with:

(a) The applicant will have an adequate program for training radiographers and radiographer's assistants and submits to the [~~Bureau~~]Executive Secretary a schedule or description of such program which specifies the:

(i) initial training;

(ii) periodic training;

(iii) on-the-job training;

(iv) means to be used by the licensee to determine the radiographer's knowledge and understanding of and ability to comply with [~~Bureau~~]Utah Radiation Control rules and licensing requirements, and the operating and emergency procedures of the applicant; and

(v) means to be used by the licensee to determine the radiographer's assistant's knowledge and understanding of the ability to comply with the operating and emergency procedures of the applicant.

(b) The applicant submits to the [~~Bureau~~]Executive Secretary and complies with satisfactory written operating and emergency procedures (described in R313-36-32 of these rules);

(c) The applicant has established and submits to the [~~Bureau~~]Executive Secretary a description of its inspection program adequate to ensure that its radiographers and radiographers' assistants follow the [~~Bureau's regulatory requirements~~]Utah Radiation Control Rules and the applicant's operating and emergency procedures. The inspection program must:

(i) include observation of the performance of each radiographer and radiographers' assistant during an actual radiographic operation at intervals not to exceed three months;

(ii) provide that, if a radiographer or a radiographers' assistant has not participated in a radiographic operation for more than three months since the last inspection, that individual's performance must be observed and recorded the next time the individual participates in a radiographic operation; and

(iii) include the retention of inspection records on the performance of radiographers or radiographers' assistants for three years.

(d) The applicant submits to the [~~Bureau~~]Executive Secretary a description of the applicant's overall organizational structure pertaining to the industrial radiography program, including specified delegations of authority and responsibility for operation of the program.

(e) The applicant conducting leak tests has established adequate procedures to be followed in leak testing sealed sources for possible leakage and contamination and submits to the [~~Bureau~~]Executive Secretary a description of such procedures including:

(i) instrumentation to be used;

(ii) method of performing tests, e.g., points on equipment to be smeared and method of taking smear; and

(iii) pertinent experience of the person who will perform the tests.

(f) The licensee shall conduct a program for inspection and maintenance of radiographic exposure devices and storage containers to assure proper functioning of components important to safety.

R313-36-20 Performance Requirements for Radiographic Equipment.

10 CFR 34.20 and 34.21, 1993 ed., which is incorporated by reference with the

following exception: substitute R313-19-100 for the reference to 10 CFR Part 71.

R313-36-21. Equipment Control.

[~~Limits on levels of radiation for radiographic exposure devices and storage containers:~~

~~(1) Radiographic exposure devices measuring less than four inches from the sealed source storage position to any exterior surface of the device shall have no radiation level in excess of 50 milliroentgens (1.29×10^{-5} C/kg) per hour at 6 inches (15 cm) from any exterior surface of the device.~~

~~(2) Radiographic exposure devices measuring a minimum of 4 inches (10 cm) from the sealed source storage position to any exterior surface of the device, and all storage containers for sealed sources or outer containers for radiographic exposure devices, shall have no radiation level in excess of 200 milliroentgens (5.16×10^{-5} C/kg) per hour at any exterior surface, and 10 milliroentgens (2.58×10^{-6} C/kg) per hour at 1 meter from any exterior surface.~~

~~(3) The radiation levels specified are with the sealed source in the shielded (i.e., "off") position.~~]

[~~(4)~~](1) Each radiation survey instrument shall be checked with a radiation source at the beginning of each day of use and at the beginning of each work shift to ensure it is operating properly.

[~~(5)~~](2) Radiographic exposure devices, source changers, or transport containers that contain radioactive material may not be stored in residential locations. This rule does not apply to storage of radioactive material in a vehicle in transit for use at temporary job sites, if the licensee complies with R313-36-23 and if the vehicle does not constitute a permanent storage location.

R313-36-22. Locking of Radiographic Exposure Devices.

(1) Each source of radiation shall be provided with a lock or lockable outer container designed to prevent unauthorized or accidental production of radiation or removal or exposure of a sealed source and shall be locked at all times except when under the direct surveillance of a radiographer or radiographer assistant. In addition, during radiographic operations the sealed source assembly shall be locked in the shielded position each time the source is returned to that position.

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

(3) Radiographic exposure devices, source changers, and storage containers, prior to being moved from one location to another and also prior to being secured at a given location, shall be locked and surveyed to assure that the sealed source is in the shielded position.

R313-36-23. Storage Precautions.

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

R313-36-24. Radiation Survey Instruments.

(1) The licensee or registrant shall maintain sufficient calibrated and operable radiation survey instruments to make physical radiation surveys as required by [~~this chapter~~]R313-36. Instrumentation required by [~~this section~~]R313-36-24 shall have a range such that 2 milliroentgens (5.16×10^{-7} C/kg) per hour through 1 roentgen (2.58×10^{-4} C/kg) per hour can be measured.

(2) Each radiation survey instrument shall be calibrated:

(a) at energies appropriate for use and at intervals not to exceed three months and after each instrument servicing;

(b) such that accuracy within + 20 percent can be demonstrated; and

(c) at two points located approximately 1/3 and 2/3 of full-scale on each scale for linear scale instruments; at midrange of each decade, and at two points of at least one decade for logarithmic scale instruments; and at appropriate points for digital instruments.

(3) Records shall be maintained of these calibrations for two years after

the calibration date for inspection by [~~the Bureau~~]representatives of the Executive Secretary.

R313-36-25. Leak Testing, Repair, Tagging, Opening, Modification, and Replacement of Sealed Sources.

(1) The replacement of any sealed source fastened to or contained in a radiographic exposure device and leak testing, repair, tagging, opening, or any other modification of any sealed source shall be performed only by persons specifically authorized to do so by the [~~Bureau~~]Executive Secretary, the U.S. Nuclear Regulatory Commission, or an Agreement State.

(2) Each sealed source shall be tested for leakage at intervals not to exceed 6 months. In the absence of a certificate from a transferor that a test has been made within the 6 month period prior to the transfer, the sealed source shall not be put into use until tested and results obtained.

(3) The leak test shall be capable of detecting the presence of 0.005 microcurie (185.0 Bq) of removable contamination on the sealed source. An acceptable leak test for sealed sources in the possession of a radiography licensee would be to test at the nearest accessible point to the sealed source storage position, or other appropriate measuring point, by a procedure to be approved pursuant to R313-36-11(1)(e). Records of leak test results shall be kept in units of microcuries (kBq) and maintained for inspection by [~~the Bureau~~]representatives of the Executive Secretary for two years after the leak test is performed or until the sealed source is transferred or disposed of, whichever comes first.

(4) Any test conducted pursuant to paragraphs (2) and (3) of [~~this section~~]R313-36-25 which reveals the presence of 0.005 microcurie (185.0 Bq) or more of removable radioactive material shall be considered evidence that the sealed source is leaking. The licensee shall immediately withdraw the equipment involved from use and shall cause it to be decontaminated and repaired or to be disposed of, in accordance with [~~rules of the Bureau~~]the Utah Radiation Control Rules. Within 5 days after obtaining results of the test, the licensee shall file a report with the [~~Bureau~~]Executive Secretary describing the involved equipment, the test results, and the corrective action taken.

(5) A sealed source which is not fastened to or contained in a radiographic exposure device shall have permanently attached to it a durable tag at least one inch square bearing the prescribed radiation caution symbol in conventional colors, magenta or purple on a yellow background, and at least the instructions: "Danger-Radioactive Material - Do Not Handle - Notify Civil Authorities if Found."

R313-36-26. Quarterly Inventory.

Each licensee shall conduct a quarterly physical inventory to account for all sealed sources received or possessed. The records of the inventories shall be maintained for three years from the date of inventory for inspection by [~~the Bureau~~]representatives of the Executive Secretary and shall include the quantities and kinds of radioactive material, the location of sealed sources, and the date of the inventory, device model, serial number and sealed source serial number.

R313-36-27. Utilization Logs.

(1) Each licensee or registrant shall maintain current logs, which shall be kept available for inspection by [~~the Bureau~~]representatives of the Executive Secretary for two years from the date of the recorded event at the address specified in the license, showing for each source of radiation the following information:

(a) a description (or make and model number) of each source of radiation or storage container in which the sealed source is located:

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

(c) locations where used and dates of use;

(d) the date each source of radiation is removed from storage and returned to storage.

(2) The requirements of [~~subsection~~]R313-36-27(1) shall not apply in industrial radiography utilizing sources of radiation in enclosed interlocked rooms which are not occupied during radiographic operations, which are equipped

with interlocks such that the source of radiation will not operate unless all openings are securely closed and which is so shielded that every location on the exterior meets conditions [~~for an unrestricted area, as~~]specified in [~~R313-15-105~~]R313-15-301.

(3) A separately identified utilization log is not required if the equivalent information is available in records of the licensee or registrant and available at the address specified in the license or registration.

R313-36-28. Inspection and Maintenance of Radiation Machines, Radiographic Exposure Devices, Storage Containers and Source Changers.

(1) The licensee or registrant shall conduct a program for inspection and maintenance of radiation machines, radiographic exposure devices, storage containers and source changers at intervals, not to exceed three months or prior to first use thereafter to assure proper functioning of components important to safety. Records of these inspections and maintenance shall be kept for three years.

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

(3) If any inspection conducted pursuant to R313-36-28(1) reveals damage to components critical to radiation safety, the device shall be removed from service until repairs have been made.

(4) Any maintenance performed on radiographic exposure devices and accessories shall be in accordance with the manufacturer's specifications.

R313-36-29. Special Requirements for Permanent Radiographic Installation.

Permanent radiographic installations having high radiation area entrance controls of the types described in [~~R313-15-203(1)(e)(ii)~~]R313-15-601(1)(b) and (c) and R313-15-601(2), or where the high radiation area is locked to protect against unauthorized or accidental entry, shall also meet the following special requirements:

(1) Each entrance that is used for personnel access to the high radiation area in a permanent radiographic installation to which [~~this section~~]R313-36-29 applies shall have both visible and audible warning signals to warn of the presence of radiation. The visible signal shall be actuated by radiation whenever the source is exposed. The audible signal shall be actuated when an attempt is made to enter the installation while the source is exposed.

(2) The control device or alarm system shall be tested for proper operation at the beginning of each day of equipment use. If a control device or alarm system is operating improperly, it shall be immediately labeled as defective and repaired before industrial radiographic operations are resumed. Records of these tests shall be maintained for [~~Bureau~~]inspection by representatives of the Executive Secretary for three years from the date of the event.

R313-36-30. Special Requirements for Enclosed Radiography.

(1) Systems for enclosed radiography designed to allow admittance of individuals during x-radiation generation shall:

(a) comply with all applicable requirements of R313-36 and [~~R313-15-105~~]R313-15-301 of these rules; and

(b) be evaluated at intervals not to exceed one year to assure compliance with the applicable requirements as specified in R313-36-30(1)(a). Records of these evaluations shall be maintained for inspection by [~~the Bureau~~]representatives of the Executive Secretary for a period of three years after the evaluation.

(2) Cabinet x-ray systems designed to exclude individuals during x-radiation are exempt from the requirements of R313-36 except that:

(a) Operating personnel must be provided with either a film badge or a thermoluminescent dosimeter and reports of the results must be maintained for inspection by [~~the Bureau~~]representatives of the Executive Secretary.

(b) No registrant shall permit any individual to operate a cabinet x-ray system until such individual has received a copy of and instruction in the operating procedures for the unit and has demonstrated competence in its use. Records which demonstrate compliance with this subparagraph shall be maintained

for inspection by [~~the Bureau~~]representatives of the Executive Secretary until disposition is authorized by the [~~Bureau~~]Executive Secretary.

(c) Tests for proper operation of high radiation area control devices or alarm systems, where applicable, must be conducted at the beginning of each day of use and recorded.

(d) The registrant shall perform an evaluation, at intervals not to exceed one year, to determine compliance with [~~R313-15-105 of these rules~~]R313-15-301. Records of these evaluations shall be maintained for inspection by [~~the Bureau~~]representatives of the Executive Secretary for a period of three years after the evaluation.

R313-36-31. Limitations - Personnel Radiation Safety Requirements for Radiographers and Radiographers' Assistant.

(1) No licensee or registrant shall permit any individual to act as a radiographer as defined in [~~this chapter~~]R313-36 until such individual has complied with all of the following:

(a) been instructed in the subjects outlined in R313-36-100;

(b) received copies of and instruction in the rules contained in [~~this chapter~~]R313-36 and the applicable sections of appropriate license(s), and the licensee's or registrant's operating and emergency procedures, and shall have demonstrated understanding thereof;

(c) demonstrated competence to use the source of radiation, related handling tools, and radiation survey instruments which will be employed in the individual's assignment;

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

(2) No licensee or registrant shall permit any individual to act as a radiographer's assistant as defined in [~~this chapter~~]R313-36 until such individual has complied with all of the following:

(a) received copies of and instruction in the licensee's or registrant's operating and emergency procedures;

(b) demonstrated competence to use under the personal supervision of the radiographer the sources of radiation, related handling tools, and radiation survey instruments which will be employed in the individual's assignment;

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

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

(3) Each licensee or registrant shall maintain, for inspection by [~~the Bureau~~]representatives of the Executive Secretary, records of training and testing which demonstrate that the requirements of R313-36-31(1) and (2) are met.

(4) Each licensee or registrant shall conduct an internal audit program to ensure that the [~~Bureau's~~]radioactive material license conditions and the licensee's or registrant's operating and emergency procedures are followed by each radiographer and radiographer's assistant. These internal audits shall be performed at least quarterly, and each radiographer shall be audited at least [~~annually~~]quarterly. Records of internal audits shall be maintained for inspection by [~~the Bureau~~]representatives of the Executive Secretary for three years from the date of the audit.

R313-36-32. Operating and Emergency Procedures.

The licensee's or registrant's operating and emergency procedures shall include instructions in at least the following:

(1) the handling and use of sources of radiation to be employed such that no individual is likely to be exposed to radiation doses in excess of the limits established in R313-15 "Standards for Protection Against Radiation;"

(2) methods and occasions for conducting radiation surveys;

(3) methods for controlling access to radiographic areas;

(4) methods and occasions for locking and securing sources of radiation;

(5) personnel monitoring and the use of personnel monitoring equipment including steps that must be taken immediately by radiography personnel in the event a pocket dosimeter is found to be off-scale;

(6) transportation to field locations, including packing of sources of radiation in the vehicles, posting of vehicles, and control of sources of radiation during transportation;

(7) minimizing exposure of individuals in the event of an accident;

(8) the procedure for notifying proper personnel in the event of a theft, loss, over exposure or accident involving sources of radiation;

(9) maintenance of records;

(10) the inspection and maintenance of radiographic exposure devices, source changers, storage containers and radiation machines.

R313-36-33. Personnel Monitoring Control.

[~~(1) No licensee or registrant shall permit any individual to act as a radiographer or as a radiographer's assistant unless, at all times during radiographic operations, each such individual shall wear a film or TLD badge and a direct reading pocket dosimeter. Pocket dosimeters shall be capable of measuring doses from zero to at least 200 milliroentgens (5.16×10^{-5} C/kg). A film or TLD badge shall be assigned to and worn by only one individual.~~

~~(2) Pocket dosimeters shall be read and doses recorded daily. Pocket dosimeters shall be charged at the beginning of each working day. Pocket dosimeters shall be checked at periods not to exceed one year for correct response to radiation. Acceptable dosimeters shall read within plus or minus 30 percent of the true radiation exposure.~~

~~(3) A film or TLD badge shall be immediately processed if a pocket dosimeter is discharged beyond its range during normal use and industrial radiographic operations by that individual shall cease. The individual shall not return to work with sources of radiation until a determination of his radiation exposure has been made.~~

~~(4) Reports received from the film badge or TLD processor and records of daily pocket dosimeter readings shall be kept for inspection by the Bureau until the Bureau authorizes their disposition.~~

~~(5) If a film badge or TLD is lost or damaged, the worker shall cease work immediately until a replacement film badge or TLD is provided and the exposure is calculated for the time period from issuance to loss or damage of the film badge or TLD.~~]10 CFR 34.33, 1993 ed., which is incorporated by reference with the following exception: substitute "Executive Secretary" for the reference to "Commission".

R313-36-41. Security-Precautionary Procedures in Radiographic Operations.

(1) During each radiographic operation, the radiographer or radiographer's assistant shall maintain a direct surveillance of the operation to protect against unauthorized entry into a high radiation area, as defined in R313-12, except:

(a) where the high radiation area is equipped with a control device or alarm system as described in [~~R313-15-203(1)(e)(ii)~~]R313-15-601(1)(a), (b) or (c); or

(b) where the high radiation area is locked to protect against unauthorized or accidental entry.

(2) When not in operation or when not under direct surveillance, portable radiation exposure devices shall be physically secured to prevent removal by unauthorized personnel.

R313-36-42. Posting.

Notwithstanding any provisions in paragraph [~~R313-15-204~~]R313-15-903 areas in which radiography is being performed or in which a radiographic exposure device is being stored shall be conspicuously posted and access to the area shall be controlled as required by [~~R313-15-203~~]R313-15-902(1) and (2).

R313-36-43. Radiation Surveys and Survey Records.

(1) At least one calibrated and operable radiation survey instrument as described in R313-36-24 shall be available and used at each site where radiographic exposures are made, and at the storage area, as defined in R313-36-2, whenever a radiographic exposure device, a storage container, or source is being placed in storage.

(2) A physical radiation survey shall be made after each radiographic

exposure utilizing radiographic exposure devices or sealed sources of radioactive material to determine that the sealed source has been returned to its shielded position. The entire circumference of the radiographic exposure device shall be surveyed. If the radiographic exposure device has a source guide tube, the survey shall include the guide tube.

(3) A physical radiation survey shall be made whenever a radiographic exposure device is placed in a storage area, as defined in R313-36-2, to determine that the sealed source is in its shielded position. The entire circumference of the radiographic exposure device must be surveyed.

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

(5) A physical radiation survey shall be made of the boundary of the restricted area during radiographic operations not employing shielded room radiography. The maximum survey reading at the boundary shall be recorded. The records shall indicate approximate distance from source to boundaries, whether or not the exposed source is collimated and any occupied areas with exposure levels greater than 2 milliroentgens (5.16×10^{-7} C/kg) in any hour during radiographic operations.

(6) A record of the storage survey required in paragraph (3) shall be made and retained for three years when that storage survey is the last one performed in the work day. Records required by paragraph (4) shall be maintained for two years after completion of the survey.

R313-36-44. Supervision of Radiographer's Assistant.

Whenever a radiographer's assistant uses radiographic exposure devices, uses sealed sources or related source handling tools, or conducts radiation surveys required by R313-36-43(2), (3), or (4) to determine that the sealed source has returned to the shielded position after an exposure, he shall be under the personal supervision, as defined in R313-36-2(4), by a radiographer. The personal supervision shall include (1) the radiographer's personal presence at the site where the sealed sources are being used; (2) the ability of the radiographer to give immediate assistance if required; and (3) the radiographer to observe the performance of his/her assistant during the operations referred to in [~~this section~~]R313-36-44.

R313-36-45. Records Required at Temporary Job Sites.

Each licensee or registrant conducting industrial radiography at a temporary site shall have the following records available at that site for inspection by [~~the Bureau~~]representatives of the Executive Secretary:

(1) appropriate license;

(2) operating and emergency procedures;

(3) applicable rules;

(4) survey records required pursuant to R313-36-43 for the period of operation at the site;

(5) daily pocket dosimeter records for the period of operation at the site; and

(6) the latest instrument calibration and leak test record for specific devices in use at the site.

R313-36-46. Specific Requirements for Radiographic Personnel Performing Industrial Radiography.

(1) At a job site, the following shall be supplied by the licensee or registrant:

(a) at least one operable, calibrated survey instrument;

(b) a current whole body personnel monitor (TLD or film badge) for each individual;

(c) an operable, calibrated pocket dosimeter with a range of zero to at least 200 milliroentgens (5.16×10^{-5} C/kg) for each worker; and

(d) the appropriate barrier ropes and signs.

(2) Industrial radiographic operations shall not be performed if any of the items in R313-36-46 are not available at the job site or are inoperable.

(3) Each licensee or registrant shall provide as a minimum two person crews when sources of radiation are used at temporary job sites.

(4) No individual other than a radiographer or a radiographer assistant

who is under the personal supervision of a radiographer instructor shall manipulate controls or operate equipment used in industrial radiographic operations.

(5) During an inspection by [~~the Bureau~~]representatives of the Executive Secretary, the [~~Bureau inspector~~]representatives of the Executive Secretary may terminate an operation if any of the items in R313-36-46 are not available and operable or if the required number of radiographic personnel are not present. Operations shall not be resumed until such conditions are met.

(6) No individual shall act as a radiographer instructor unless such individual:

(a) has met the requirements of R313-36-31;

(b) has one year of documented experience as an radiographer; and

(c) has been named as a radiographer instructor on the license issued by the [~~Bureau~~]Executive Secretary.

R313-36-50. Prohibitions.

Industrial radiography performed with a sealed source which is not fastened to or contained in a radiographic exposure device (fishpole technique) is prohibited unless specifically authorized in a license issued by the [~~Bureau~~]Executive Secretary.

R313-36-100. The Training of Radiographers.

The training of radiographers shall include at least the following:

(1) Fundamentals of radiation safety:

(a) characteristics of ionizing radiation;

(b) units of radiation dose and quantity of radioactivity;

(c) hazards of exposure to radiation;

(i) radiation protection standards;

(ii) biological effects of radiation dose;

(d) levels of radiation from sources of radiation;

(e) methods of controlling radiation dose;

(i) working time;

(ii) working distances; and

(iii) shielding.

(2) Radiation detection instrumentation to be used:

(a) use of radiation survey instruments;

(i) operation;

(ii) calibration;

(iii) limitations;

(b) survey techniques;

(c) use of personnel monitoring equipment;

(i) film badges;

(ii) pocket dosimeters; and

(iii) thermoluminescent dosimeters.

(3) Radiographic equipment to be used:

(a) remote handling equipment;

(b) radiographic exposure devices and sealed sources;

(c) storage containers; and

(d) operation and control of x-ray equipment.

(4) The requirements of pertinent federal and state rules.

(5) The licensee's or registrant's written operating and emergency procedures.

(6) Case histories of radiography accidents.

KEY: industry, radioactive material, licensing, surveys
[~~1989~~]1994 **[~~26-1-29~~]19-3-104**
19-3-108

State of Utah
Administrative Rule Analysis
Notice of Proposed Rule/Change

D.A.R. FILE NUMBER: ~~15137~~ 15139

CODE NUMBER
AGENCY - RULE - SECTION
R 313 - 36 -

Division of Administrative Rules
State Archives Building, State Capitol
Salt Lake City, Utah 84114
Telephone 538-3011

Department: Environmental Quality
Agency: Radiation Control
Address: 168 N 1950 W / PO Box 144850
Salt Lake City UT 84116 (84114-4850)
Contact Person: Craig Jones
Telephone: (801) 536-4250

1. CODE TITLE OF RULE OR SECTION

R313-36 Special Requirements for Industrial Radiographic Operations

2. REASON FOR AND SUMMARY OF RULE OR CHANGE

The proposed rules are intended to reduce inadvertent radiation exposures, from the use of industrial radiographic equipment, of radiography personnel and the general public. The rules also meet requirements associated with the federal-state agreement for control of radiation (see UCA 19-3-113). Nonsubstantive changes are included in this filing. The proposed rules specify safety features which must be included on industrial radiographic devices and require radiography personnel to wear a device which emits a warning signal at a preset radiation dose.

3. COST OR SAVINGS IMPACT OF RULE - UCA 63-46a-4(3)

STATE BUDGET:
LOCAL GOV'T:
PUBLIC:

No cost or savings impact on the State or Local gov't. Approximately 70 radiography personnel must be provided radiation warning devices ($150 per device x 70 = $10,500). Replacement of radiography exposure devices from effective date until 01/10/96 cost a maximum of $227,700. (12 facilities x $6,325 = $227,700.)

4. TYPE OF NOTICE

☒ PROPOSED RULE (☐ NEW ☒ AMEND ☐ REPEAL)
☐ CHANGE IN PROPOSED RULE (CHANGES PROPOSED RULE FILE NUMBER _____)
☐ 120-DAY RULE - UCA 63-46a-7
☐ FIVE-YEAR REVIEW / CONTINUATION

5. JUSTIFICATION FOR 120-DAY RULE CHECKED ABOVE - UCA 63-46a-7(1)

6. ☒ RULE AUTHORIZED BY STATE CODE / CONSTITUTION (CITATION): UCA 19-3-104
☐ RULE REQUIRED BY FEDERAL MANDATE (U.S. CODE, CFR, OR FED. REGISTER CITATION):

7. PUBLIC MAY PARTICIPATE IN RULEMAKING BY: (REQUIRED ONLY FOR PROPOSED RULES)

WRITTEN OR ORAL COMMENT
UNTIL: 01/03/94

PUBLIC HEARING (MAY BE OPTIONAL)
DATE:
TIME:
PLACE:

NOTE: PUBLIC MAY REQUEST HEARING IN ACCORDANCE WITH UCA 63-46a-5(2)(b)

THIS RULE/CHANGE MAY BECOME EFFECTIVE ON:
01/04/94

8. INDEXING INFORMATION

AGENCY NOTE: TEXT MUST BE IN CODE FORMAT

STATE STATUTE CITATION(S): UCA 19-3-104 & 19-3-113
KEY WORD(S): industry, radioactive material, licensing, surveys

THE FULL TEXT OF ALL PROPOSED ADMINISTRATIVE RULES OR RULE CHANGES IS PUBLISHED IN THE UTAH STATE BULLETIN UNLESS EXCLUDED BECAUSE OF LENGTH AND SPACE LIMITATION. THE FULL TEXT MAY BE INSPECTED AT THE AGENCY (ADDRESS ABOVE) OR DIVISION OF ADMINISTRATIVE RULES.

9. AUTHORIZATION

William J. Sinclair, Executive Secretary 11/10/93
AGENCY HEAD OR DESIGNEE DATE

Utah Radiation Control Board
AGENCY

SEND WHITE & YELLOW TO D.A.R., YELLOW WILL BE RETURNED TO AGENCY

10. DIVISION OF ADMINISTRATIVE RULES

RECEIVED BY: NL DATE: 11/15/93 TIME: 8:46
120-DAY RULE EFFECTIVE: N≠A LAPSES: N/A
☐ TOO LONG TO PRINT PAGES: 9

12/90

59 FR 64980
10/18/94 effective date

R313. Environmental Quality, Radiation Control.
R313-38. Radiation Safety Requirements for Wireline Service Operation and Subsurface Tracer Studies.
R313-38-1. Purpose and [~~Scope~~]Authority.

[~~The rules in this chapter~~]R313-38 establishes radiation safety requirements for persons using sources of radiation for wireline service operations including mineral logging, radioactive markers, and subsurface tracer studies. The requirements of [~~this chapter~~]R313-38 are in addition to, and not in substitution for, the requirements of R313-12, R313-15, R313-16, R313-18 and R313-19[~~of these rules~~]. The rules in [~~this chapter~~]R313-38 apply to all licensees or registrants who use sources of radiation for wireline service operations including mineral logging, radioactive markers, or subsurface tracer studies.

R313-38-2. Definitions.

As used in [~~this chapter the following definitions apply~~]R313-38:

[~~(1)~~]"Field station" means a facility where radioactive sources may be stored or used and from which equipment is dispatched to temporary job sites.

[~~(2)~~]"Fresh water aquifer" means a geologic formation that is capable of yielding fresh water to a well or spring.

[~~(3)~~]"Injection tool" means a device used for controlled subsurface injection of radioactive tracer material.

"Irretrievable well logging source" means a sealed source containing licensed 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.

[~~(4)~~]"Logging assistant" means an individual who, under the personal supervision of a logging supervisor, handles sources of radiation or tracers that are not in logging tools or shipping containers or who performs surveys required by R313-38-67.

[~~(5)~~]"Logging supervisor" means an individual who uses sources of radiation or provides personal supervision in the use of sources of radiation at a temporary job site and who is responsible to the licensee or registrant for assuring compliance with the Utah Radiation Control Rules and the conditions of the license.

[~~(6)~~]"Logging tool" means a device used subsurface to perform well[-]logging.

[~~(7) "Mineral logging" means any logging performed for the purpose of mineral exploration other than oil or gas.~~]

[~~(8)~~]"Personal supervision" means guidance and instruction by a logging supervisor, who is physically present at a temporary job site, who is in personal contact with logging assistants, and who can give immediate assistance.

[~~(9)~~]"Radioactive marker" means radioactive material placed subsurface or on a structure intended for subsurface use for the purpose of depth determination or direction orientation. For purposes of [~~this chapter~~]R313-38, this term includes radioactive collar markers and radioactive iron nails.

[~~(10)~~]"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.

[~~(11)~~]"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.

[~~(12)~~]"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.

[~~(13)~~]"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.

[~~(14)~~]"Uranium sinker bar" means a weight containing depleted uranium used to pull a logging tool toward the bottom of a well.

[~~(15)~~]"Well-bore" means a drilled hole in which wireline service operations and subsurface tracer studies are performed.

[~~(16)~~]"Well logging" means the lowering and raising of measuring devices or tools which [~~may~~]contain sources of radiation into well-bores or cavities for the purpose of obtaining information about the well or adjacent geological formations.

[~~(17)~~]"Wireline" means a cable containing one or more electrical conductors which is used to lower and raise logging tools in the well-bore.

[~~(18)~~]"Wireline service operation" means any evaluation or mechanical service which is performed in the well-bore using devices on a wireline.

R313-38-13. Specific Licenses for Well Logging.

The [~~Bureau~~]Executive Secretary will approve an application for a specific license for the use of licensed material in well logging if the applicant meets the following requirements:

(1) The applicant shall satisfy the general requirements specified in R313-22-34 and [~~any~~]the special requirements contained in [~~this chapter~~]R313-38.

(2) The applicant shall develop a program for training logging supervisors and logging assistants and submit to the [~~Bureau~~]Executive Secretary a description of this program which specifies the:

(a) initial training;

(b) on-the-job training;

(c) annual safety reviews provided by the licensee;

(d) [~~means~~]methods that the applicant will use to [~~demonstrate~~]evaluate the logging supervisor's knowledge and understanding of and ability to comply with [~~the Bureau's~~]these rules and licensing requirements and the applicant's operating and emergency procedures; and

(e) [~~means~~]methods that the applicant will use to [~~demonstrate~~]evaluate the logging assistant's knowledge and understanding of and ability to comply with the applicant's operating and emergency procedures.

(3) The applicant shall submit to the [~~Bureau~~]Executive Secretary written operating and emergency procedures, as described in R313-38-63, or an outline or summary of the procedures that includes the important radiation safety aspects of the procedures.

(4) The applicant shall establish and submit to the [~~Bureau~~]Executive Secretary its program for annual inspections of the job performance of[~~each~~] logging supervisors to ensure that [~~the Bureau~~]these rules, license requirements, and the applicant's operating and emergency procedures are followed. Inspection records must be retained for [~~3~~]three years after[~~each~~] annual internal inspections.

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

(6) If an applicant wants to perform leak testing of sealed sources, the applicant shall identify the manufacturers and the model numbers of the leak test kits to be used. If the applicant wants to analyze its own wipe samples, the applicant shall establish procedures to be followed and submit a description of these procedures to the [~~Bureau~~]Executive Secretary. The description must include the:

(1) instruments to be used;

(2) methods of performing the analysis; and

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

R313-38-15. Agreement With Well Owner or Operator.

(1) 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 must identify who will meet the following requirements:~~]The following requirements shall be met and the written agreement shall identify who will be responsible for meeting these requirements.

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

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

(c) The radiation monitoring required in [~~R313-38-69(1)~~]R313-38-69(3) will be performed.

(d) 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.

(e) If the sealed source is classified as irretrievable after reasonable efforts at recovery have been expended, the following requirements [~~must~~]shall be implemented within 30 days:

(i) [~~Each irretrievable~~]Irretrievable well logging sources must be immobilized and sealed in place with a cement plug.

(ii) A mechanical device to prevent inadvertent intrusion on the source must be set at some point in the well above the cement plug, unless the cement plug and source are not accessible to [~~any~~]subsequent drilling operations.

(iii) A permanent identification plaque, constructed of long lasting material such as stainless steel, brass, bronze, or monel, must 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 [~~7 inches (17 cm) square and 1/8 inch (3 mm)~~]17 centimeters (seven inches) square and three millimeters (one-eighth inch) thick. The plaque must contain:

(A) the word "CAUTION;"

(B) the radiation symbol (the color requirement in R313-15-901(1) need not be met);

(C) the date the source was abandoned;

(D) the name of the well owner or well operator, as appropriate;

(E) the well name and well identification number or other designation;

(F) an identification of the sealed source by radionuclide and quantity;

(G) the depth of the source and depth of the top of the plug; and

(H) an appropriate warning, such as, "DO NOT RE-ENTER THIS WELL."]

(2) The licensee shall retain a copy of the written agreement for [~~3~~]three years after the completion of the well logging operation.

(3) On a case by case basis, a[~~A~~] licensee may apply, for Executive Secretary approval pursuant to R313-38-91, [~~for Bureau approval, on a case by case basis,~~]of proposed procedures to abandon an irretrievable well logging source in a manner not otherwise authorized in [~~paragraph (1)(e) of this section~~]R313-38-15(1)(e).

(4) 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 otherwise meet the requirements in [~~paragraphs~~]R313-38-15(1)(a) through [~~(1)~~](e).

R313-38-17. Request for Written Statements.

[~~Each license is~~]Licenses are issued with the condition that the licensee will, [~~at any time before~~]prior to expiration of the license, upon the [~~Bureau's~~]Executive Secretary's request, submit written statements, signed under oath or affirmation, to enable the [~~Bureau~~]Executive Secretary to determine whether or not the license should be modified, suspended, or revoked.

R313-38-20. Limits on Levels of Radiation.

Sources of radiation shall be used, stored, and transported in[~~such~~] a manner that meets the transportation requirements in R313-19-100 and the dose limitation requirements of R313-15[~~of these rules are met~~].

R313-38-31. Labels, Security, and Transportation Precautions.

(1) Labels.

(a) 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 R313-15-901(1), without the[~~conventional~~] color requirements, and the wording "[~~DANGER~~]CAUTION (or [~~CAUTION~~]DANGER) RADIOACTIVE MATERIAL."

(b) The licensee may not use a container to store licensed material unless the container has securely attached to it a durable, legible, and clearly visible label. The label must contain the radiation symbol specified in R313-15-901(1), and the wording "CAUTION (or DANGER) RADIOACTIVE MATERIAL, NOTIFY CIVIL AUTHORITIES (or NAME OF COMPANY)."

(c) The licensee may not transport licensed material unless the material is packaged, labeled, marked, and accompanied with appropriate shipping papers in accordance with rules set out in R313-19-100.

(2) Security Precautions During Storage and Transportation.

(a) The licensee shall store [~~each~~]sources containing licensed material in a storage container or transportation package. The container or package must 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.

(b) 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.

R313-38-33. Radiation Detection Instruments.

(1) The licensee or registrant shall keep a calibrated and operable radiation survey instrument capable of detecting beta and gamma radiation at[~~each~~] field stations and temporary job sites to make the radiation surveys required by [~~this chapter~~]R313-38-67 and by R313-15-501. To satisfy this requirement, the radiation survey instrument must be capable of [~~measuring 0.1 milliroentgen (2.58 x 10^{-8} C/kg) per hour through at least 50 milliroentgens (1.29 x 10^{-5} C/kg) per hour. Survey instruments acquired before (the effective date) and capable of measuring 0.1 milliroentgen (2.58 x 10^{-8} C/kg) per hour through at least 20 milliroentgens (5.16 x 10^{-6} C/kg) per hour also satisfy this requirements until January 1, 1993.~~]detecting dose rates over the range of one microsievert (0.1 mrem) per hour to at least 0.5 millisievert (50 mrem) per hour.

(2) The licensee or registrant 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 or registrant may own the instruments or may have a procedure to obtain them quickly from a second party.

(3) The licensee or registrant shall have[~~each~~] radiation survey instruments required under [~~paragraph (1) of this section~~]R313-38-33(1) calibrated:

(a) at intervals not to exceed [~~6~~]six months and after instrument servicing;

(b) for linear scale instruments, at two points located approximately [~~1/3~~]one-third and [~~2/3~~]two-thirds of full-scale; for logarithmic scale instruments, at midrange of [~~each~~]the decades, and at two points of at least one decade; and for digital instruments, at appropriate points; and

(c) so that an accuracy within plus or minus 20 percent of the calibration standard can be demonstrated on [~~each~~]the scales.

(4) The licensee or registrant shall retain calibration records for a period of [~~3~~]three years after the date of calibration for inspection by [~~the Bureau~~]a representative of the Board or the Executive Secretary.

R313-38-35. Leak Testing of Sealed Sources.

(1) [~~Requirements. Each licensee~~]Testing and recordkeeping. Licensees using sealed sources of radioactive material shall have the sources tested for leakage. Records of leak test results shall be kept in units of [~~microcuries (kBq)~~]kilobecquerels (uCi) and maintained for inspection by [~~the Bureau~~]a representative of the Board or the Executive Secretary for three years after the leak test is performed.

(2) Method of Testing. Tests for leakage shall be performed only by persons specifically authorized to perform [~~such~~]those tests by the [~~Bureau~~]Executive Secretary, the U.S. Nuclear Regulatory Commission, an Agreement State, or a Licensing State. The test sample shall be taken from the surface of the source, source holder, or from the surface of the device in which the source is stored or mounted and on which one might expect contamination to accumulate. The test sample shall be analyzed for radioactive contamination, and the analysis shall be capable of detecting the presence of [~~0.005 microcurie (185.0 Bq)~~]185 becquerels (0.005 uCi) of radioactive material on the test sample.

(3) Interval of Testing. [~~Each sealed~~]Sealed sources of radioactive material shall be tested at intervals not to exceed six months or at alternative

intervals approved by the Executive Secretary, an Agreement State, a Licensing State, or the U.S. Nuclear Regulatory Commission. In the absence of a certificate from a transferor indicating that a test has been made prior to the transfer, the sealed source shall not be put into use until tested. If[~~, for any reason,~~] it is suspected that a sealed source may be leaking, it shall be removed from service immediately and tested for leakage as soon as practical.

(4) Removal of Leaking or Contaminated Sources. If the test reveals the presence of [~~0.005 microcurie (185.0 Bq)~~]185 becquerels (0.005 uCi) or more of leakage or contamination, the licensee shall immediately withdraw the source from use and shall cause it to be decontaminated, repaired, or disposed of in accordance with [~~these rules~~]R313-15. A report [~~describing the equipment involved, the test results, and the corrective action taken~~]shall be filed with the [~~Bureau~~]Executive Secretary in accordance with R313-15-1208.

(5) Exemptions. The following sources are exempt from the periodic leak test requirements of R313-38-35(1) through (4):

(a) hydrogen-3 sources;

(b) sources of radioactive material with a half-life of 30 days or less;

(c) sealed sources of radioactive material in gaseous form;

(d) sources of beta or gamma emitting radioactive material with an activity of [~~100 microcuries (3.7 MBq)~~]3.7 megabecquerels (100 uCi) or less; and

(e) sources of alpha-emitting radioactive material with an activity of [~~10 microcuries (370.0 kBq)~~]370 kilobecquerels (10 uCi) or less.

R313-38-37. Physical Inventory.

[~~Each~~]At intervals not to exceed six months licensees or registrants shall conduct a [~~semiannual~~]physical inventory to account for all sources of radiation received and possessed under the license. The licensee or registrant shall retain records of the inventory for [~~3~~]three years from the date of the inventory for inspection by [~~the Bureau~~]a representative of the Board or the Executive Secretary. The inventory must indicate the quantity and kind of licensed material, the location of the licensed material, the date of the inventory, and the name of the individual conducting the inventory. Physical inventory records may be combined with leak test records.

R313-38-39. Records of[~~, Material~~] Use.

(1) [~~Each licensee~~]Licensees or registrants shall maintain records for [~~each~~]uses of [~~licensed material~~]sources of radiation showing:

(a) the make, model number, and a serial number or a description of[~~each~~] sources of radiation used;

(b) 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;

(c) the identity of the logging supervisor who is responsible for the sources of radiation and the identity of logging assistants present;

(d) the location and date of use.

(2) The licensee or registrant shall make the records required by [~~paragraph~~]R313-38-39(1)[~~of this section~~] available for inspection by [~~the Bureau~~]a representative of the Board or the Executive Secretary. The licensee or registrant shall retain the records for [~~3~~]three years from the date of the recorded event.

R313-38-41. Design, Performance, and Certification Criteria for Sealed Sources Used in Downhole Operations.

(1) [~~Each sealed~~]Sealed sources, except those containing radioactive material in gaseous form, used in downhole operations, and manufactured after January 1, 1982, shall be certified by the manufacturer, or other testing organization acceptable to the [~~Bureau~~]Executive Secretary, to meet the following minimum criteria:

(a) be of doubly encapsulated construction;

(b) contain radioactive material whose chemical and physical forms are as insoluble and non-dispersible as practical; and

(c) the sealed source's prototype has been tested and found to maintain its integrity after [~~each of~~]the following tests:

(i) temperature: the test source must be held at -40 degrees [~~C~~]Celsius

for 20 minutes, 600 degrees [~~C~~]Celsius for [~~1~~]one hour, and then be subject to a thermal shock test with a temperature drop from 600 degrees [~~C~~]Celsius to 20 degrees [~~C~~]Celsius within 15 seconds.

(ii) impact test: a [~~5 kg~~]five kilogram steel hammer, 2.5 [~~cm~~]centimeter in diameter, must be dropped from a height of [~~1 m~~]one meter onto the test source.

(iii) vibration test: the test source must be subject to a vibration from 25 [~~Hz~~]hertz to 500 [~~Hz~~]hertz at [~~5 g~~]five gravitational units amplitude for 30 minutes.

(iv) puncture test: a [~~1~~]one gram hammer and pin, 0.3 [~~cm~~]centimeter pin diameter, must be dropped from a height of [~~1 m~~]one meter onto the test source.

(v) pressure test: has been individually pressure tested to at least 24,600 pounds per square inch absolute (1.695×10^8 pascals) without failure.

(2) For sealed sources, except those containing radioactive material in gaseous form, acquired after July 14, 1989, in the absence of a certificate from a transferor certifying that an individual sealed source meets the requirements of R313-38-41(1), the sealed source shall not be put into use until [~~such~~]the determinations and testing have been performed.

(3) [~~Each sealed~~]Sealed sources, except those containing radioactive material in gaseous form, used in downhole operations after July 14, 1989, shall be certified by the manufacturer, or other testing organization acceptable to the [~~Bureau~~]Executive Secretary, as meeting the sealed source performance requirements for oil well logging as contained in the American National Standard[~~s~~] [~~N542~~]N43.6, "Classification of Sealed Radioactive Sources[~~, Classification~~]" in effect on July 14, 1989.

(4) Certification documents shall be maintained for inspection by [~~the Bureau~~]a representative of the Board or the Executive Secretary for a period of [~~2~~]two years after source disposal. If the source is abandoned downhole, the certification documents shall be maintained until the [~~Bureau~~]Executive Secretary authorizes disposition.

R313-38-43. Inspection, Maintenance, and Opening of a Source or Source Holder.

(1) [~~Each licensee~~]Licensees or registrants 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 that required labeling is present. If defects are found, the equipment must be removed from service until repaired, and a record must be retained for [~~3~~]three years after the defect is found.

(2) [~~Each licensee~~]Licensees or registrants 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 that no physical damage is visible. If defects are found, the equipment must be removed from service until repaired, and a record must be made listing: date, equipment involved, inspection and maintenance operations performed, [~~any~~] defects found, and[~~any~~] actions taken to correct the defects. These records must be retained for [~~3~~]three years after the defect is found.

(3) 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 R313-38-63 has been approved by the [~~Bureau~~]Executive Secretary, the Nuclear Regulatory Commission, [~~pursuant to 10 CFR 39.13(c)~~] or by an Agreement State.

(4) If a sealed source is stuck in the source holder, the licensee may not perform[~~any~~] operations, [~~such as~~]like drilling, cutting, or chiseling, on the source holder unless the licensee is specifically approved by the [~~Bureau~~]Executive Secretary, the Nuclear Regulatory Commission or an Agreement State to perform this operation.

(5) The opening, repair, or modification of[~~any~~] sealed sources must be performed by persons specifically approved to do so by the [~~Bureau~~]Executive Secretary, the Nuclear Regulatory Commission or an Agreement State.

R313-38-44. Handling Tools.

The licensee shall provide and require the use of tools that will assure

remote handling of sealed sources other than low-activity calibration sources.

R313-38-45. Subsurface Tracer Studies.

(1) Protective gloves and[~~other~~] appropriate protective clothing and equipment shall be used by[~~all~~] personnel handling radioactive tracer material. Precautions shall be taken to avoid ingestion or inhalation of radioactive material.

(2) [~~No licensee~~]Licensees shall not cause the injection of radioactive material into [~~potable~~]fresh water aquifers without prior written authorization from the [~~Bureau~~]Executive Secretary and[~~any~~] other appropriate State [~~Bureau~~]Agencies.

R313-38-47. Radioactive Markers.

The licensee may use radioactive markers in wells only if the individual markers contain quantities of licensed material not exceeding the quantities specified in R313-19-71[~~of these rules~~]. The use of markers is subject only to the requirements of R313-38-37.

R313-38-48. Particle Accelerators.

[~~No licensee~~]Licensees or registrants shall not 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 R313-15-201 and R313-15-301, as applicable, are met.

R313-38-49. Uranium Sinker Bars.

[~~The licensee~~]Licensees may use a uranium sinker bar in well logging after July 14, 1988, only if it is legibly impressed with the words "CAUTION - RADIOACTIVE-DEPLETED URANIUM" and "NOTIFY CIVIL AUTHORITIES (or COMPANY NAME) IF FOUND."

R313-38-51. Use of a Sealed Source in a Well Without a Surface Casing.

[~~The licensee~~]Licensees 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 source becoming lodged in the well. The procedures must be approved by the [~~Bureau~~]Executive Secretary, the Nuclear Regulatory Commission or an Agreement State.

R313-38-61. Training Requirements.

(1) [~~No licensee~~]Licensees or registrants shall not permit[~~any~~] individuals to act as a logging supervisors as defined in [~~this chapter~~]R313-38 until [~~such~~]the individual has complied with[~~all of~~] the following:

(a) received, in a course recognized by the [~~Bureau~~]Executive Secretary, the Nuclear Regulatory Commission, an Agreement State, or a Licensing State, instruction in the subjects outlined in R313-38-61(5)[~~of this chapter~~] and demonstrated an understanding thereof by successfully completing a written test;

(b) read and received instruction in the rules contained in [~~this chapter~~]R313-38 and the applicable sections of R313-12, R313-15 and R313-18 or their equivalent, conditions of appropriate license or certificate of registration, and the licensee's or registrant's operating and emergency procedures, and demonstrated an understanding thereof; and

(c) has 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.

(2) [~~No licensee~~]Licensees or registrants shall not permit[~~any~~] individuals to act as a logging assistants as defined in [~~this chapter~~]R313-38 until [~~such~~]the individual has complied with[~~all of~~] the following:

(a) [~~Read~~]read or received instruction in the licensee's or registrant's operating and emergency procedures and documented an understanding thereof;

(b) [~~Has~~]has received instruction in applicable sections of R313-12, R313-15 and R313-18 [~~of these rules~~]or their equivalent;

(c) [~~Demonstrated~~]demonstrated competence to use, under the personal supervision of the logging supervisor, the sources of radiation, related handling tools, and radiation survey instruments which will be used on the job; and

(d) [~~Has~~]has demonstrated understanding of the materials listed in

[~~paragraphs~~]R313-38-61(2)(a) and (b)[~~of this section~~] by successfully completing a written or oral test.

(3) [~~The licensee~~]Licensees or registrants shall provide safety reviews for logging supervisors and logging assistants at least [~~once during each calendar year~~]annually.

(4) The licensee or registrant shall maintain a record on[~~each~~] logging [~~supervisor's~~]supervisors and logging [~~assistant's~~]assistants training and annual safety review. The training records must include copies of written tests and dates of oral tests given after January 1, 1989. The training records must be retained until [~~3~~]three years following the termination of employment. Records of annual safety reviews must list the topics discussed and be retained for [~~3~~]three years.

(5) The licensee or registrant shall include the following subjects in the training required in [~~paragraph (1)(a) of this section~~]R313-38-61(1)(a).

(a) Fundamentals of radiation safety including:

(i) characteristics of radiation;

(ii) units of radiation dose and quantity of radioactivity;

(iii) hazards of exposure to radiation;

(iv) levels of radiation from licensed material;

(v) methods of controlling radiation dose (time, distance, and shielding); and

(vi) radiation safety practices, including prevention of contamination, and methods of decontamination.

(b) Radiation detection instruments including:

(i) use, operation, calibration, and limitations of radiation survey instruments;

(ii) survey techniques; and

(iii) use of personnel monitoring equipment.

(c) Equipment to be used including:

(i) operation of equipment, including source handling equipment and remote handling tools;

(ii) storage, control, and disposal of licensed material; and

(iii) maintenance of equipment.

(d) The requirements of pertinent federal and state rules.

(e) Case histories of accidents in well logging.

R313-38-63. Operating and Emergency Procedures.

[~~Each licensee~~]Licensees or registrants shall develop and follow written operating and emergency procedures that cover the following:

(1) the handling and use of sources of radiation including the use of sealed sources in wells without surface casing for protecting fresh water aquifers, if appropriate;

(2) handling and use of sources of radiation to be employed so that no individual is likely to be exposed to radiation doses in excess of the standards established in R313-15[~~of these rules~~];

(3) methods and occasions for conducting radiation surveys;

(4) methods and occasions for locking and securing sources of radiation;

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

(6) transportation to temporary job sites and field stations, including the packaging and placing of sources of radiation in vehicles, placarding of vehicles, and securing sources of radiation during transportation;

(7) minimizing exposure of individuals in the event of an accident;

(8) procedure for notifying proper personnel in the event of an accident;

(9) maintenance of records;

(10) inspection and maintenance of sealed sources, source holders, logging tools, source handling tools, storage containers, transport containers, injection tools, and uranium sinker bars;

(11) procedure to be followed in the event a sealed source is lodged downhole;

(12) procedures to be used for picking up, receiving, and opening packages containing radioactive material;

(13) for the use of tracers, procedures to be used for decontamination of the environment, equipment, and personnel; and

[~~(14) identifying and reporting to the Bureau defects and noncompliance as~~

~~required by R313-12-51 of these rules; and~~]

[~~(15)~~](14) actions to be taken if a sealed source is ruptured including actions to prevent the spread of contamination and minimize inhalation and ingestion of licensed materials and actions to obtain suitable radiation survey instruments as required by R313-38-33.

R313-38-65. Personnel Monitoring.

(1) The licensee or registrant [~~may~~]shall not permit an individual to act as the logging supervisor or logging assistant unless that person wears, at all times during the handling of [~~licensed radioactive materials~~]sources of radiation, either a film badge or a thermoluminescent dosimeter (TLD). [~~Each film~~]Film badges or TLD's must be assigned to and worn by only one individual. Film badges must be replaced at least monthly and TLD's replaced at least quarterly. After replacement, [~~each~~]the film badges or TLD's must be promptly processed.

(2) The licensee[~~or registrant~~] shall provide bioassay services to individuals using licensed materials in subsurface tracer studies if required by the license.

(3) The licensee or registrant shall retain records of film badge, TLD and bioassay results for inspection [~~until the Bureau authorizes disposition of the records~~]by a representative of the Board or the Executive Secretary.

R313-38-67. Radiation Surveys.

(1) The licensee shall make radiation surveys, including but not limited to, the surveys required under [~~paragraphs~~]R313-38-67(2) through (6)[~~of this section~~], of [~~each~~]areas where licensed materials are used and stored.

(2) Before transporting licensed materials, the licensee shall make a radiation survey of the position occupied by [~~each~~]individuals in the vehicle and of the exterior of [~~each~~]a vehicle used to transport the licensed materials.

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

(4) If the licensee has reason to believe that, as a result of[~~any~~] operations 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.

(5) The licensee shall make a radiation survey at the temporary job site before and after[~~each~~] subsurface tracer [~~study~~]studies to confirm the absence of contamination.

(6) The results of surveys required [~~under paragraphs~~]by R313-38-67(1) through (5)[~~of this section must~~]shall be recorded and must include the date of the survey, the name of the individual making the survey, the identification of the survey[~~,~~] instrument used, and the location of the survey. The licensee shall retain records of surveys for three years after they are made, for inspection by [~~the Bureau for 3 years after they are made~~]a representative of the Board or the Executive Secretary.

R313-38-69. Radioactive Contamination Control.

(1) If the licensee detects evidence that a sealed source has ruptured or licensed materials have caused contamination, the licensee shall initiate immediately the emergency procedures required by R313-38-63.

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

(3) 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~~]they are present, to check for contamination resulting from damage to the sealed source.

R313-38-71. Security.

(1) A logging supervisor [~~must~~]shall be physically present at a temporary job site whenever licensed material [~~are~~]is being handled or [~~are~~]is not stored

and locked in a vehicle or storage place. The logging supervisor may leave the job site in order to obtain assistance if a source becomes lodged in a well.

(2) 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 R313-12-3[~~of these rules~~].

R313-38-73. Documents and Records Required at Field Stations.

[~~Each licensee~~]Licensees or registrants shall maintain, for inspection by [~~the Bureau~~]a representative of the Board or the Executive Secretary, the following documents and records for the specific devices and sources used at the field station:

(1) appropriate license, certificate or registration, or equivalent document;

(2) operating and emergency procedures;

(3) a copy of R313-12, R313-15, R313-16, R313-18, R313-19 and R313-38 of the Utah Radiation Control rules, as applicable;

(4) records of the latest survey instrument calibrations pursuant to R313-38-33;

(5) records of the latest leak test results pursuant to R313-38-35;

(6) physical inventory records required pursuant to R313-38-37;

(7) utilization records required pursuant to R313-38-39;

(8) records of inspection and maintenance required pursuant to R313-38-43;

(9) training records required by R313-38-61; and

(10) survey records required pursuant to R313-38-67.

R313-38-75. Documents and Records Required at Temporary Job Sites.

[~~Each licensee~~]Licensees or registrants conducting operations at a temporary job site shall have the following documents and records available at that site for inspection by [~~the Bureau~~]a representative of the Board or the Executive Secretary:

(1) operating and emergency procedures;

(2) survey records required pursuant to R313-38-67 for the period of operation at the site;

(3) evidence of current calibration for the radiation survey instruments in use at the site; and

(4) when operating in the State under reciprocity, a copy of the appropriate license, certificate of registration, or equivalent document.

R313-38-77. Notification of Incidents, Abandonment, and Lost Sources.

(1) Notification of incidents and sources lost in other than downhole logging operations shall be made in accordance with appropriate provisions of R313-15[~~of these rules~~].

(2) Whenever a sealed source or device containing radioactive material is lodged downhole, the licensee shall:

(a) monitor at the surface for the presence of radioactive contamination with a radiation survey instrument or logging tool during logging tool recovery operations; and

(b) notify the [~~Bureau~~]Executive Secretary immediately by telephone if radioactive contamination is detected at the surface or if the source appears to be damaged.

(3) When it becomes apparent that efforts to recover the radioactive source will not be successful, the licensee shall:

(a) advise the well owner or operator, as appropriate, of the Utah Radiation Control Rules regarding abandonment and an appropriate method of abandonment, which shall include:

(i) the immobilization and sealing in place of the radioactive source with a cement plug;

(ii) the setting of a whipstock or other deflection device; and

(iii) the mounting of a permanent identification plaque, at the surface of the well, containing the appropriate information required by [~~R313-38-77(4)~~]R313-38-15(1)(e);

(b) notify the [~~Bureau~~]Executive Secretary by telephone, giving the

circumstances of the loss, and request approval of the proposed abandonment procedures; and

(c) file a written report with the [~~Bureau~~]Executive Secretary within 30 days of the abandonment, setting forth the following information:

(i) date of occurrence and a brief description of attempts to recover the source;

(ii) a description of the radioactive source involved, including radionuclide, quantity, and chemical and physical form;

(iii) surface location and identification of well;

(iv) results of efforts to immobilize and set the source in place;

(v) depth of the radioactive source;

(vi) depth of the top of the cement plug;

(vii) depth of the well; and

(viii) information contained on the permanent identification plaque.

[~~(4) Whenever a sealed source containing radioactive material is abandoned downhole, the licensee shall provide a permanent plaque, for posting the well or well bore. This plaque shall:~~

~~(a) be constructed of long-lasting material, such as brass, bronze, stainless steel or monel, and must be mounted at the surface of the well unless the mounting of the plaque is not practical.~~

~~(b) contain the following information engraved on its face:~~

~~(i) the word "CAUTION;"~~

~~(ii) the radiation symbol without the conventional color requirements;~~

~~(iii) the date of abandonment;~~

~~(iv) the name of the well operator or well owner;~~

~~(v) the well name and well identification number or other designation;~~

~~(vi) the sealed source by radionuclide and quantity of activity;~~

~~(vii) the source depth and the depth to the top of the plug; and~~

~~(viii) an appropriate warning, depending on the specific circumstances of each abandonment. Appropriate warnings may include: "DO NOT DRILL BELOW PLUG BACK DEPTH," "DO NOT ENLARGE CASING," or "DO NOT RE-ENTER THE HOLE," followed by the words, "BEFORE CONTACTING THE BUREAU OF RADIATION CONTROL."~~]

[~~(5)~~](4) The licensee shall immediately notify the [~~Bureau~~]Executive Secretary by telephone and subsequently by confirming letter if the licensee knows or has reason to believe that radioactive material has been lost in or to an underground potable water source. [~~Such notice~~]Notices shall designate the well location and shall describe the magnitude and extent of loss of radioactive material, assess and consequences of [~~such~~]the loss, and explain efforts planning or being taken to mitigate these consequences.

R313-38-91. Exemptions.

The [~~Bureau,~~]Executive Secretary may, upon application of[~~-any~~] interested persons or upon [~~its own~~]his initiative, grant[~~-such~~] exemptions from the requirements of the rules in [~~this chapter~~]R313-38 as [~~it~~]he determines are authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest.

R313-38-98. Example of Plaque for Identifying Wells Containing Sealed Sources Containing Radioactive Material Abandoned Downhole.

TABLE

"(COMPANY NAME)
(WELL IDENTIFICATION)
CAUTION
ONE [~~2~~]- TWO CURIE CS-137 RADIOACTIVE SOURCE ABANDONED
3-3-75 AT 8400 [~~Ft.~~]FEET PLUG BACK DEPTH 8200 [~~Ft.~~]FEET
DO NOT RE-ENTER THIS WELL BEFORE CONTACTING
[~~(RADIATION CONTROL AGENCY)~~]THE EXECUTIVE SECRETARY OF THE
UTAH RADIATION CONTROL BOARD"

The size of the plaque should be convenient for use on active or inactive wells, [~~e.g., a 7~~-]for example, a seven inch square letter size of the word "CAUTION" should be approximately twice the letter size of the rest of the

information, [~~e.g., 1/2 inch and 1/4~~]or one-half inch and one-quarter inch letter size respectively.

KEY: licensing, radioactive material, administrative responsibility, surveys
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