ADOPTED REGULATION OF THE

DEPARTMENT OF HUMAN RESOURCES

LCB File No. R137-01

Effective May 30, 2003

EXPLANATION – Matter in ***italics*** is new; matter in brackets ~~[omitted material]~~ is material to be omitted.

AUTHORITY: §§1-106, NRS 459.030.

Section 1. Chapter 459 of NAC is hereby amended by adding thereto the provisions set forth as sections 2 to 32, inclusive, of this regulation.

Sec. 2. ***"Bequerel" means a unit of measurement of radioactivity. One bequerel is that quantity of radioactive material which decays at the rate of one disintegration per second. One bequerel is equivalent to 2.7 x 10^{11} curie.***

Sec. 3. ***"Constraint" has the meaning ascribed to it in 10 C.F.R. § 20.1003.***

Sec. 4. ***"Control panel" has the meaning ascribed to in NAC 459.422.***

Sec. 5. ***"Critical group" means the group of natural persons that, for any particular set of circumstances, are reasonably expected to receive the greatest exposure to residual radioactivity.***

Sec. 6. ***"Direct reading pocket dosimeter" means an ion-chamber pocket dosimeter or an electronic personal dosimeter.***

Sec. 7. ***"Distinguishable from background radiation" means that, using adequate measurement technology, survey and statistical techniques, the detectable concentration of a radionuclide is statistically different from the background concentration of that radionuclide:***

1. In the site; or

2. In the case of a structure, in similar materials.

Sec. 8. *"Generator" means:*

1. A waste generator; or

2. An entity that operates pursuant to a license issued by the Nuclear Regulatory Commission or an agreement state and to which waste is attributed pursuant to the Low-Level Radioactive Waste Policy Amendments Act of 1985, 42 U.S.C. §§ 2021b et seq.

Sec. 9. *"Gray" means a special unit of absorbed dose. One gray equals an absorbed dose of 1 joule per kilogram of material. One gray is equivalent to 100 rads.*

Sec. 10. *"Naturally occurring or accelerator-produced radioactive material" includes naturally occurring radioactive material, including materials generated by accelerators used in subatomic particle physics research, and accelerator-produced radioactive material. The term does not include by-product, source or special nuclear material.*

Sec. 11. *1. "Residual radioactivity" means the amount of radioactivity detectable in structures, material, soils, ground water or other media at a site that is attributable to activities under the control of a licensee, including all licensed or unlicensed sources of radiation used by a licensee.*

2. The term includes the detectable amount of radioactivity attributable to radioactive materials remaining at the site from routine or accidental releases, or burials, of radioactive materials at the site.

3. The term does not include the detectable amount of radioactivity attributable to background radiation.

Sec. 12. *"Shipping papers" means Form 540 and, if necessary, Form 540A, published by the Nuclear Regulatory Commission.*

Sec. 13. *"Sievert" means the special unit of any of the quantities expressed as a dose equivalent that is equal to the absorbed dose in grays multiplied by the quality factor. One sievert is equivalent to 100 rems.*

Sec. 14. *"Waste type" means a waste, within a disposal container, that has a unique physical description. The term includes, without limitation, a waste that has a specific descriptor code and a waste that is sorbed on or solidified in a specifically defined medium.*

Sec. 15. *"X-ray industrial radiography" means the examination of the macroscopic structure of materials by nondestructive methods utilizing X-ray sources of radiation.*

Sec. 16. *"X-ray system" has the meaning ascribed to it in NAC 459.542.*

Sec. 17. *As used in sections 3, 5, 7, 11 and 17 to 25, inclusive, of this regulation, unless the context otherwise requires, the words and terms defined in sections 3, 5, 7 and 11 of this regulation have the meanings ascribed to them in those sections.*

Sec. 18. *1. Except as otherwise provided in subsection 2, the provisions of NAC 459.027 and 459.200 and sections 3, 5, 7, 11 and 17 to 25, inclusive, of this regulation apply to any facility licensed by the division pursuant to NAC 459.010 to 459.950, inclusive, and sections 2 to 32, inclusive, of this regulation.*

2. A facility licensed by the division pursuant to NAC 459.010 to 459.950, inclusive, and sections 2 to 32, inclusive, of this regulation is not subject to the provisions of NAC 459.027 and 459.200 and sections 3, 5, 7, 11 and 17 to 25, inclusive, of this regulation if the facility:

(a) Has been decommissioned before May 30, 2003, pursuant to:

(1) The federal Site Decommissioning Management Plan of April 16, 1992, set forth at 57 FR 13389 ff; or

(2) Other criteria approved by the division; or

(b) Submitted a decommissioning plan before August 20, 1998, that, except for any day-to-day extension granted by the division for the submission of an environmental impact statement, was approved by the division before August 20, 1999, pursuant to the federal Site Decommissioning Management Plan of April 16, 1992, set forth at 57 FR 13389 ff.

Sec. 19. *For the purposes of sections 3, 5, 7, 11 and 17 to 25, inclusive, of this regulation, the total effective dose equivalent to the average member of the critical group used is the peak annual total effective dose equivalent expected within the first 1,000 years after decommissioning.*

Sec. 20. *The division will require a licensee to perform additional cleanup to a site that has been decommissioned and the license for which has been terminated pursuant to sections 3, 5, 7, 11 and 17 to 25, inclusive, of this regulation if, based on new information, the division determines that:*

1. The criteria for decommissioning and license termination set forth in sections 3, 5, 7, 11 and 17 to 25, inclusive, of this regulation were not met; and

2. The residual radioactivity distinguishable from background radiation remaining at the site could result in a significant threat to public health and safety.

Sec. 21. *The property of a decommissioned facility is eligible for release for unrestricted use if the residual radiation, distinguishable from background radiation, including ground water sources of drinking water:*

1. Results in the average member of the critical group receiving a total effective dose equivalent that does not exceed 25 millirem (0.25 millisievert) per year; and

2. Is as low as is reasonably achievable.

Sec. 22. ***1. The property of a decommissioned facility that is not eligible for release for unrestricted use is eligible for release for restricted use if the licensee:***

(a) Demonstrates that further reductions in residual radioactivity necessary to comply with section 21 of this regulation:

(1) Would result in net increase in harm to the public or environment; or

(2) Were not being made because the levels of residual radioactivity associated with restricted conditions are as low as is reasonably achievable.

(b) Establishes that the licensee has provided for institutional controls that:

(1) Are legally enforceable;

(2) Provide reasonable assurance that the average member of the critical group will receive a total effective dose equivalent from residual radioactivity at the site distinguishable from background radiation that does not exceed 25 millirem (0.25 millisievert) per year; and

(3) Will not impose an undue burden on the community to be affected by the decommissioning or any person or institution therein.

(c) Provides, by a method set forth in subsection 4, sufficient financial assurance to enable a third party, including a governmental custodian of the site, to assume and carry out responsibilities for any necessary control and maintenance of the site.

(d) Submits to the division a decommissioning plan that:

(1) Declares the intent of the licensee to decommission in accordance with NAC 459.1955;

(2) Specifies that the licensee intends to decommission by restricting the use of the site; and

(3) Documents how the advice of persons and institutions in the community that may be affected by the decommissioning has been sought, analyzed and, if appropriate, incorporated into the decommissioning plan.

(e) Provides reasonable assurance that the residual radioactivity at the site distinguished from background radiation has been reduced to levels such that, even in the absence of the institutional controls required by paragraph (b), the average member of the critical group will receive a total effective dose equivalent, from residual radioactivity at the site distinguishable from background radiation, that:

(1) Is as low as is reasonably achievable; and

(2) Except as otherwise provided in subsection 2, does not exceed 100 millirem (1 millisievert) per year.

2. A licensee may satisfy the requirements of subparagraph (2) of paragraph (e) of subsection 1 if the licensee:

(a) Provides reasonable assurance that the average member of the critical group will receive a total effective dose equivalent, from residual radioactivity at the site distinguishable from background radiation, that does not exceed 500 millirem (5 millisieverts) per year;

(b) Demonstrates that reducing residual radioactivity to the level necessary to comply with the 100 millirem (1 millisievert) requirement of subparagraph (2) of paragraph (e) of subsection 1 is not technically feasible, would be prohibitively expensive, or would likely result in net harm to the public or environment;

(c) Makes provisions for durable institutional controls; and

(d) Provides, by a mechanism set forth in subsection 4, sufficient financial assurance to enable a third party, including a governmental custodian of the site:

(1) To carry out periodic rechecks of the site not less frequently than every 5 years to ensure that the institutional controls remain in place as necessary to meet the criteria of paragraph (b) of subsection 1; and

(2) To assume and carry out responsibility for any necessary control and maintenance of those controls.

3. Before a licensee may submit to the division a decommissioning plan pursuant to subsection 1, the licensee must seek advice from natural persons and institutions in the community who may be affected by the decommissioning concerning whether the licensee's proposed plan of decommissioning satisfies each of the requirements of paragraphs (b) and (c) of subsection 1.

4. A licensee, to satisfy the requirements of this section relating to the provision of financial assurance, may use any of the following methods:

(a) The deposit of an amount of money in cash or liquid assets into an account that is segregated from the assets of the licensee and outside the administrative control of the licensee as described in paragraph (a) of subsection 9 of NAC 459.1955;

(b) Provision of a surety, including insurance, or other guarantee, as described in paragraph (b) of subsection 9 of NAC 459.1955;

(c) If the licensee is a federal, state or local governmental entity, a statement of intent as described in paragraph (d) of subsection 9 of NAC 459.1955; or

(d) If a federal, state or local governmental entity is assuming custody and ownership of the site, any arrangement or mechanism for financial assurance that the governmental entity determines is adequate.

Sec. 23. ***1. The division may terminate a license and release the property of a decommissioned facility for restricted or unrestricted use using alternate criteria greater than the dose criterion of 25 millirem (0.25 millisievert) per year set forth in section 21 of this regulation and paragraph (b) of subsection 1 of section 22 of this regulation if the licensee:***

(a) By submitting an analysis of possible sources of exposure, provides reasonable assurance that:

(1) The public health and safety will continue to be protected; and

(2) It is unlikely that the dose from all man-made sources combined, other than medical, would be more than the limit of 0.1 rem (1 millisievert) per year set forth in NAC 459.335;

(b) Has employed, to the extent practical, restrictions on site use according to the provisions of section 22 of this regulation in minimizing exposures at the site;

(c) Reduces doses to levels that are as low as is reasonably achievable; and

(d) Submits to the division a decommissioning plan that:

(1) Declares the intent of the licensee to decommission in accordance with NAC 459.1955;

(2) Specifies that the licensee proposes to decommission pursuant to the alternate criteria provisions of this section; and

(3) Documents how the advice of natural persons and institutions in the community that may be affected by the decommissioning has been sought, analyzed and, if appropriate, incorporated into the decommissioning plan.

2. To satisfy the public comment requirement of subparagraph (3) of paragraph (d) of subsection 1, a licensee shall:

(a) Provide an opportunity for participation by representatives of a broad cross section of community interests;

(b) Provide an opportunity for a comprehensive, collective discussion on the issues by the participants represented; and

(c) Make publicly available a summary of the results of all such discussions, including, without limitation:

(1) A description of the individual viewpoints of the participants on the issues; and

(2) The extent of agreement and disagreement among the participants on the issues.

3. Before the division terminates a license using the alternate criteria of this section, the division will consider the recommendations of the staff of the division concerning any comments provided by the Environmental Protection Agency and any public comments submitted pursuant to section 24 of this regulation.

Sec. 24. *1. The division will notify the public and seek public comment:*

(a) Upon receipt of a decommissioning plan;

(b) Upon receipt of a proposal for the release of a site pursuant to section 22 or 23 of this regulation; or

(c) If the commission determines such notice to be in the public interest under the circumstances.

2. Notice will be given and comment will be sought from:

(a) State and local governments and any Indian nation or other indigenous people that have treaty or statutory rights:

(1) In the vicinity of the site; and

(2) That could be affected by the decommissioning;

(b) Some segment of the general public; and

(c) If the proposal is to release a site pursuant to the alternate criteria set forth in section 23 of this regulation, the Environmental Protection Agency.

3. Notice to the public must be accomplished by publication in a forum that is readily accessible to natural persons in the vicinity of the site, including, without limitation:

(a) Newspapers;

(b) Letters sent directly to state or local organizations; and

(c) Any other appropriate forum.

Sec. 25. *An applicant for any license issued by the division pursuant to NAC 459.010 to 459.950, inclusive, and sections 2 to 32, inclusive, of this regulation, except an applicant for the renewal of a license, must describe in the application how facility design and procedures for operation will:*

1. Minimize, to the extent practicable, the:

(a) Contamination of the facility and environment; and

(b) Generation of radioactive waste; and

2. Facilitate eventual decommissioning.

Sec. 26. *1. A licensee, an employee of a licensee, a contractor or subcontractor of a licensee, or an employee of a contractor or subcontractor of a licensee, who knowingly provides to a licensee, or to a contractor or subcontractor of a licensee, any component, equipment, material or other good or service that relates to the activities of the licensee pursuant to this chapter shall not:*

(a) Engage in deliberate misconduct; or

(b) Deliberately submit to the division, a licensee, or a contractor or subcontractor of a licensee information that the person submitting the information knows to be incomplete or inaccurate in some respect material to the division.

2. A person who violates subsection 1 may be subject to an enforcement action by the division.

3. As used in this section:

(a) "Contractor" includes a supplier and a consultant.

(b) "Deliberate misconduct" means an intentional act or omission that the person knows:

(1) Would cause or, if not detected, would have caused, a licensee to be in violation of any rule, regulation or order of the division, or of any term, condition or limitation of a license issued by the division; or

(2) Constitutes a violation of a requirement, procedure, instruction, contract, purchase order or policy of a licensee, contractor or subcontractor.

Sec. 27. *The declaration of a woman who has declared her pregnancy remains in effect until the woman making the declaration:*

1. Withdraws the declaration in writing; or

2. Is no longer pregnant.

Sec. 28. *1. A person who operates an X-ray system for X-ray industrial radiography must:*

(a) Be trained in the:

(1) Normal operating procedures for each X-ray system he operates; and

(2) Emergency procedures related to radiation safety for each facility at which he operates; and

(b) Receive the information, instruction or advice set forth in subsection 1 of NAC 459.784.

2. A registrant engaged in X-ray industrial radiography shall make a record of all such training and maintain such records for not less than 3 years after the termination of the employee.

3. As used in this section, "normal operating procedures" has the meaning ascribed to it NAC 459.650.

Sec. 29. *An X-ray system used in X-ray industrial radiography must:*

1. Have an indication light that indicates when the X-ray system is operating. The light must be clearly visible from any area with access to the X-ray system.

2. If it is a cabinet X-ray system, comply with section 31 of this regulation.

Sec. 30. *A registrant that engages in X-ray industrial radiology shall post with signs, in the manner set forth in subsection 2 of NAC 459.3555, any pathway leading to a high radiation area and any barrier, including a temporary barrier, that is intended to prevent unauthorized access to a high radiation area.*

Sec. 31. *1. In addition to any applicable requirement of NAC 459.010 to 459.794, inclusive, a person registered with the division to use a sealed source to engage in industrial radiography shall comply with all applicable requirements of, and may rely on all applicable exclusions or exemptions included in, the provisions of Part 34 of Title 10 of the Code of Federal Regulations, as adopted by reference in this section.*

2. Part 34 of Title 10 of the Code of Federal Regulations, as those provisions existed on January 1, 2001, is hereby adopted by reference, subject to the following:

(a) Except as otherwise provided in this section, any reference to "Commission's regulations," "federal regulations" or "NRC regulations" shall be deemed a reference to "NAC 459.010 to 459.950, inclusive, and sections 2 to 32, inclusive, of this regulation";

(b) Except in 10 C.F.R. § 34.20 and as otherwise provided in this section, any reference to the "Commission" or "NRC" shall be deemed a reference to the "division";

(c) Except as otherwise provided in this section, any reference to "NRC or an Agreement State," "Commission or an Agreement State" or "Commission or by an Agreement State" shall be deemed a reference to "division, Nuclear Regulatory Commission or an agreement state";

(d) Except as otherwise provided in this section, any reference to "NRC license" shall be deemed a reference to "license issued by the division pursuant to NAC 459.010 to 459.950, inclusive, and sections 2 to 32, inclusive, of this regulation";

(e) Any reference to "10 CFR part 19" or "10 CFR 19" shall be deemed a reference to "NAC 459.780 to 459.794, inclusive";

(f) Any reference to "10 CFR part 20" or "10 CFR 20" shall be deemed a reference to "NAC 459.320 to 459.374, inclusive";

(g) Any reference to "10 CFR 20.1601(a)(1)" or "§ 20.1601(a)(1)" shall be deemed a reference to "paragraph (a) of subsection 1 of NAC 459.341";

(h) Any reference to "10 CFR 20.1902" or "§ 20.1902" shall be deemed a reference to "NAC 459.3555";

(i) Any reference to "10 CFR 20.1903" or "§ 20.1903" shall be deemed a reference to "NAC 459.3565";

(j) Any reference to "10 CFR 20.2203" or "§ 20.2203" shall be deemed a reference to "NAC 459.371";

(k) The full text of a sentence that contains any reference to "10 CFR part 21" or "10 CFR 21" shall be deemed omitted;

(l) The full text of a sentence that contains any reference to "10 CFR 30.7," "§ 30.7," "10 CFR 30.9," "§ 30.9," "10 CFR 30.10" or "§ 30.10" shall be deemed omitted;

(m) Any reference to "10 CFR 30.33" or "§ 30.33" shall be deemed a reference to "NAC 459.238";

(n) Any reference to "10 CFR 30.50" or "§ 30.50" shall be deemed a reference to "NAC 459.373";

(o) Any reference to "10 CFR part 34" or "10 CFR 34" shall be deemed a reference to "section 31 of this regulation";

(p) Any reference to "10 CFR 34.111" shall be deemed a reference to "NAC 459.120";

(q) Any reference to "10 CFR 71," "10 CFR part 71," "10 CFR 71.5," "§ 71.5," or "49 CFR parts 171-173" shall be deemed a reference to "NAC 459.314";

(r) Any reference to "10 CFR 150.20" or "§ 150.20" shall be deemed a reference to "NAC 459.210";

(s) In 10 C.F.R. § 34.3, any reference to "offshore platform radiography" shall be deemed a reference to "platform radiography";

(t) In 10 C.F.R. § 34.27(d), any reference to:

(1) "Commission regulations" shall be deemed a reference to "NAC 459.307"; and

(2) "Director of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001" or "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'" shall be deemed a reference to "division pursuant to NAC 459.307";

(u) In 10 C.F.R. § 34.43(a)(2), any reference to "Commission" shall be deemed a reference to "division, Nuclear Regulatory Commission or an agreement state";

(v) In 10 C.F.R. § 34.89, any reference to "Agreement State" shall be deemed a reference to "Nuclear Regulatory Commission or an agreement state";

(w) In 10 C.F.R. § 34.101(a), any reference to "U.S. Nuclear Regulatory Commission, Division of Industrial and Medical Nuclear Safety, Washington, DC 20555-0001, with a copy to the Director, Office for Analysis and Evaluation of Operation Data, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001," shall be deemed a reference to "division";

(x) In 10 C.F.R. § 34.101(c), any reference to "appropriate NRC regional office listed in § 30.6(a)(2) of this chapter" shall be deemed a reference to "division"; and

(y) In Appendix A to Part 34 of Title 10 of the Code of Federal Regulations:

(1) The reference in item 12 of section I to "Commission and other independent certifying organizations and/or Agreement States" shall be deemed a reference to "division, Nuclear Regulatory Commission, other independent certifying organizations and agreement states";

(2) The reference in item 1 of section II to "Agreement State regulations" shall be deemed a reference to "regulations of the Nuclear Regulatory Commission or an agreement state"; and

(3) The reference in item 2 of section II to "an Agreement State or a NRC licensee" shall be deemed a reference to "a person that holds a license issued pursuant to NAC 459.010 to 459.950, inclusive, and sections 2 to 32, inclusive, of this regulation by the Nuclear Regulatory Commission or an agreement state."

3. The following sections of Part 34 of Title 10 of the Code of Federal Regulations, as those provisions existed on January 1, 2001, are not adopted by reference:

(a) Section 34.1;

(b) Section 34.5;

(c) Section, 34.8;

(d) Section 34.11;

(e) Section 34.45(a)(9);

(f) Section 34.121; and

(g) Section 34.123.

4. A copy of a publication that contains Part 34 of Title 10 of the Code of Federal Regulations may be obtained from the Superintendent of Documents, United States Government Printing Office, Washington, D.C. 20402, at the price of $55.

Sec. 32. ***A program for inspecting and maintaining transport containers that complies with the provisions of 10 CFR § 34.31(b), as those provisions existed on January 1, 2001, shall be deemed to comply with the applicable provisions of Part 71 of Title 10 of the Code of Federal Regulations, as those provisions existed on January 1, 2001.***

Sec. 33. NAC 459.010 is hereby amended to read as follows:

459.010 As used in NAC 459.010 to 459.950, inclusive, ***and sections 2 to 32, inclusive, of this regulation,*** unless the context otherwise requires, the words and terms defined in NAC

459.012 to 459.1165, inclusive, ***and sections 2, 8, 9, 10, 12, 13 and 14 of this regulation*** have the meanings ascribed to them in those sections.

Sec. 34. NAC 459.012 is hereby amended to read as follows:

459.012 "Absorbed dose" means the energy imparted to matter by ionizing radiation per unit mass of irradiated material at the place of interest. The special ~~[unit]~~ ***units*** of absorbed dose ~~[is the rad.]~~ ***are the rad and the gray.***

Sec. 35. NAC 459.0145 is hereby amended to read as follows:

459.0145 "Activity" means the rate of disintegration or decay of radioactive material. ***The units of activity are the curie and the bequerel.***

Sec. 36. NAC 459.0205 is hereby amended to read as follows:

459.0205 "As low as is reasonably achievable" means making every reasonable effort to maintain exposures to radiation as far below the applicable limits as is practical, in a manner that is consistent with the purpose for which the licensed or registered activity is undertaken, taking into account:

1. The state of the technology;

2. The costs of improving the technology, including a consideration of the extent to which any improvements would benefit the health and safety of the public;

3. The utilization of licensed or registered sources of radiation in the public interest; and

4. Any other societal and socioeconomic considerations ~~[.]~~ ***, including, without limitation, the potential for death or other harm that could reasonably be expected to result from transportation accidents that occur during the process of decontamination and waste disposal.***

Sec. 37. NAC 459.021 is hereby amended to read as follows:

459.021 1. "Background radiation" means:

(a) Radiation from cosmic sources; ~~[and]~~

(b) Naturally occurring radioactive materials, including ~~[:~~

~~(1) Radon,]~~ ***radon,*** except as a product of decay from source or special nuclear materials; and

~~[(2)]~~ ***(c)*** Global fallout as it exists in the environment from the testing of nuclear explosive devices ~~[.]~~ ***, or past nuclear accidents, that contributes to background radiation and is not under the control of the licensee.***

2. The term does not include ***sources of*** radiation from any radioactive material regulated by the division ~~[.]~~ ***pursuant to NAC 459.010 to 459.950, inclusive, and sections 2 to 32, inclusive, of this regulation.***

Sec. 38. NAC 459.026 is hereby amended to read as follows:

459.026 "Curie" means a unit of measurement of radioactivity. One curie (Ci) is that quantity of radioactive material which decays at the rate of 3.7×10^{10} disintegrations per second (dps). ***One curie is equivalent to 37 kilobequerels.***

Sec. 39. NAC 459.027 is hereby amended to read as follows:

459.027 "Decommission" means to remove ***a facility or site*** safely from service ~~[the premises of a facility where radioactive material is located]~~ and reduce residual radioactivity to a level that permits ~~[release]~~ ***:***

1. Release of the property for unrestricted use and ~~[allows the division to terminate]~~ ***termination of*** the license of the licensee ~~[.]~~ ***; or***

2. Release of the property under restricted conditions and termination of the license of the licensee.

Sec. 40. NAC 459.034 is hereby amended to read as follows:

459.034 “Dose equivalent” means the product of the absorbed dose in a tissue, quality factor and all other necessary modifying factors at the location of interest. The ~~[unit]~~ ***units*** of dose equivalent ~~[is the rem.]~~ ***are the rem and the sievert.***

Sec. 41. NAC 459.0386 is hereby amended to read as follows:

459.0386 ~~[“Eye]~~ ***“Lens*** dose equivalent” means the dose equivalent from a source of radiation external to the body that is measured at a depth of 0.3 centimeter in the lens of the eye.

Sec. 42. NAC 459.042 is hereby amended to read as follows:

459.042 “High radiation area” means any area, accessible to persons, in which radiation ***from a source of radiation external to the body*** exists at such levels that a person could receive a dose equivalent in excess of 0.1 rem ***(1 millisievert)*** in 1 hour at 30 centimeters from ~~[the]~~ ***:***

1. The source of radiation ***;*** or ~~[from any]~~

2. Any surface that the radiation penetrates.

Sec. 43. NAC 459.054 is hereby amended to read as follows:

459.054 “Occupational dose” means the dose received by a natural person in the course of employment in which the natural person’s duties involve exposure to radiation or radioactive material from licensed and unlicensed sources of radiation, whether in the possession of a licensee or registrant or any other person. The term does not include a dose received by a natural person ~~[from]~~ ***:***

1. From background radiation ~~[,]~~ ***;***

2. From any medical administration of radiation ~~[,]~~ ***to the person;***

3. From exposure to other natural persons who have been administered radiopharmaceuticals or have received permanent implants containing radioactive material and have been released from the control of a licensee pursuant to NAC 459.256;

4. ***From*** voluntary participation in medical research ***;*** or ~~[as]~~

5. ***As*** a member of the public.

Sec. 44. NAC 459.060 is hereby amended to read as follows:

459.060 "Personnel monitoring equipment" means devices designed to be worn by a ***natural*** person for the assessment of dose equivalent, including, but not limited to, film badges, ~~[thermoluminescent]~~ ***thermoluminescence*** dosimeters, pocket ionization chambers and ***personal*** devices for sampling air.

Sec. 45. NAC 459.065 is hereby amended to read as follows:

459.065 "Public dose" means the dose received by a member of the public from ***exposure to*** radiation or radioactive material that is released by a licensee, or from another source of radiation under the control of a licensee or registrant. The term does not include a dose received by a natural person from ~~[background radiation, any]~~ ***:***

1. ***Background radiation;***

2. ***Any*** medical administration of radiation ***to the person;***

3. ***Exposure to other natural persons who have been administered radiopharmaceuticals or have received permanent implants containing radioactive material and have been released from the control of a licensee pursuant to NAC 459.256;*** or ~~[voluntary]~~

4. ***Voluntary*** participation in medical research.

Sec. 46. NAC 459.066 is hereby amended to read as follows:

459.066 "Rad" means the special unit of absorbed dose. One rad equals one hundredth of a joule per kilogram of material; for example, if tissue is the material of interest, 1 rad equals 100 ergs per gram of tissue. ***One rad is equivalent to 10 milligrays.***

Sec. 47. NAC 459.086 is hereby amended to read as follows:

459.086 “Rem” means the special unit of any of the quantities expressed as a dose equivalent that is equal to the absorbed dose in rads multiplied by the quality factor. ***One rem is equivalent to 10 millisieverts.***

Sec. 48. NAC 459.0885 is hereby amended to read as follows:

459.0885 “Residual waste” means low-level radioactive waste resulting from processing or decontamination that ***, because it*** cannot be easily separated into distinct batches attributable to individual waste generators ~~[.]~~ ***, is attributed to the processor or decontamination facility, as applicable.***

Sec. 49. NAC 459.1145 is hereby amended to read as follows:

459.1145 “Very high radiation area” means an area, accessible to persons, in which radiation levels ***from a source of radiation external to the body*** could result in a person receiving an absorbed dose in excess of 500 rads ***(5 grays)*** in 1 hour at 1 meter from ~~[a]~~ ***:***

1. ***A*** radiation source ***;*** or ~~[from any]~~

2. ***Any*** surface that the radiation penetrates.

Sec. 50. NAC 459.1156 is hereby amended to read as follows:

459.1156 “Woman who has declared her pregnancy” means a woman who has voluntarily informed ~~[her employer,]~~ ***the relevant licensee or registrant,*** in writing, of her pregnancy and the estimated date of conception.

Sec. 51. NAC 459.118 is hereby amended to read as follows:

459.118 ***The provisions of*** NAC 459.010 to 459.950, inclusive, ***and sections 2 to 32, inclusive, of this regulation*** apply to all persons who receive, possess, use, transfer, own or acquire any source of radiation except as otherwise specifically provided in ~~[these regulations.]~~ ***NAC 459.010 to 459.950, inclusive, and sections 2 to 32, inclusive, of this regulation.*** Nothing

in ~~[these regulations]~~ ***NAC 459.010 to 459.950, inclusive, and sections 2 to 32, inclusive, of this regulation*** applies to any person to the extent he is subject to regulation by the Nuclear Regulatory Commission.

Sec. 52. NAC 459.124 is hereby amended to read as follows:

459.124 ***1.*** In addition to other records required by NAC 459.010 to 459.950, inclusive, ***and sections 2 to 32, inclusive, of this regulation,*** each licensee and registrant shall maintain records showing his receipt, transfer and disposal of all sources of radiation.

2. A licensee authorized to possess, in an unsealed form, radioactive material with a half-life greater than 120 days shall:

(a) Before his license terminates, forward to the division:

(1) All records of licensed radioactive material disposed of by the licensee pursuant to NAC 459.3595 to 459.3615, inclusive, including burials authorized before January 28, 1981; and

(2) All records required by paragraph (d) of subsection 2 of NAC 459.3645; and

(b) If the licensee transfers or assigns any licensed activities to another licensee, transfer to the other licensee:

(1) All records of licensed material disposed of by the licensee pursuant to NAC 459.3595 to 459.3615, inclusive, including burials authorized before January 28, 1981; and

(2) All records required by paragraph (d) of subsection 2 of NAC 459.3645.

3. A licensee to whom records are transferred pursuant to paragraph (b) of subsection 2 shall maintain the records until the termination of his license.

4. A licensee whose license is being terminated shall, before his license terminates, forward to the division the records required by subsection 10 of NAC 459.1955.

Sec. 53. NAC 459.180 is hereby amended to read as follows:

459.180 1. ***The provisions of*** NAC 459.180 to 459.314, inclusive, provide for the licensing of radioactive materials. No person may receive, possess, use, transfer, own or acquire radioactive material except as authorized in a specific or general license issued pursuant to NAC 459.180 to 459.314, inclusive, or as otherwise provided in those sections.

2. In addition to the requirements of NAC 459.180 to 459.314, inclusive, all licensees are subject to the requirements of NAC 459.010 to 459.142, inclusive, 459.320 to 459.374, inclusive, and 459.780 to 459.794, inclusive. Licensees engaged in industrial ~~[radiographic operations]~~ ***radiography*** are subject to the requirements of ~~[NAC 459.680 to 459.736, inclusive,]~~ ***section 31 of this regulation,*** and licensees using radioactive materials in the healing arts are subject to the requirements of NAC 459.3801 to 459.3966, inclusive.

Sec. 54. NAC 459.184 is hereby amended to read as follows:

459.184 1. Except as otherwise provided in subsection 2, any person is exempt from NAC 459.180 to 459.314, inclusive, to the extent that he receives, possesses, uses, transfers, owns or acquires products or materials containing ~~[radioactive]~~ ***:***

(a) Radioactive material in concentrations not in excess of those listed in NAC 459.186 ~~[.]~~ ***; or***

(b) Naturally occurring radioactive material that contains less than 5 picocuries of radium 226 per gram of material.

2. A person ~~[may]~~ ***shall*** not introduce radioactive material into a product or material knowing or having reason to believe that it will be transferred to persons exempt under subsection 1 or the equivalent regulations of the Nuclear Regulatory Commission or any

agreement state, except in accordance with a specific license issued pursuant to NAC 459.276 or the general licenses provided in NAC 459.210.

3. Except as otherwise provided in subsections 4 and 5, any person is exempt from the provisions of NAC 459.010 to 459.950, inclusive, ***and sections 2 to 32, inclusive, of this regulation*** to the extent that he receives, possesses, uses, transfers, owns or acquires radioactive material in individual quantities each of which does not exceed the applicable quantity set forth in NAC 459.188.

4. The provisions of NAC 459.180 to 459.314, inclusive, do 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.

5. ~~[No person may,]~~ ***A person shall not,*** for purposes of commercial distribution, transfer radioactive material in the individual quantities in NAC 459.188, knowing or having reason to believe that such quantities of radioactive material will be transferred to persons exempt under subsections 3 and 4 or the equivalent regulations of the Nuclear Regulatory Commission or any agreement state, except in accordance with a specific license issued by the Nuclear Regulatory Commission pursuant to 10 C.F.R. § 32.18 or by the division pursuant to NAC 459.278. The license must state that the radioactive material may be transferred by the licensee to persons exempt under subsections 3 and 4 or the equivalent regulations of the Nuclear Regulatory Commission or any agreement state.

Sec. 55. NAC 459.190 is hereby amended to read as follows:

459.190 1. Except for persons who apply radioactive material to, or persons who incorporate radioactive material into, the following products, any person is exempt from NAC

459.010 to 459.950, inclusive, ***and sections 2 to 32, inclusive, of this regulation*** to the extent that he receives, possesses, uses, transfers, owns or acquires the following products:

(a) Timepieces, hands or dials containing not more than the following specified quantities of radioactive material and not exceeding the following specified levels of radiation:

(1) Twenty-five millicuries ***(925 megabequerels)*** of tritium per timepiece.

(2) Five millicuries ***(185 megabequerels)*** of tritium per hand.

(3) Fifteen millicuries ***(555 megabequerels)*** of tritium per dial. If bezels are used, they are considered part of the dial.

(4) One hundred microcuries ***(3.7 megabequerels)*** of promethium 147 per watch or 200 microcuries ***(7.4 megabequerels)*** of promethium 147 per other timepiece.

(5) Twenty microcuries ***(740 kilobequerels)*** of promethium 147 per watch hand or 40 microcuries ***(1.48 megabequerels)*** of promethium 147 per other timepiece hand.

(6) Sixty microcuries ***(2.22 megabequerels)*** of promethium 147 per watch dial or 120 microcuries ***(4.44 megabequerels)*** of promethium 147 per other timepiece dial. If bezels are used, they are considered part of the dial.

(7) Fifteen-hundredths microcurie ***(5.55 kilobequerels)*** of radium per timepiece.

(8) Three-hundredths microcurie ***(1.11 kilobequerels)*** of radium per hand.

(9) Nine-hundredths microcurie ***(3.33 kilobequerels)*** of radium per dial. If bezels are used, they are considered part of the dial.

(10) Notwithstanding these quantities, the levels of radiation from hands and dials containing promethium 147 or radium 226 must not exceed, when measured through 50 milligrams per square centimeter of absorber:

(I) For wrist watches, 0.1 millirad ***(1 microgray)*** per hour at 10 centimeters from any surface;

(II) For pocket watches, 0.1 millirad ***(1 microgray)*** per hour at 1 centimeter from any surface, also radium must not be used for pocket watches; and

(III) For any other timepiece, 0.2 millirad ***(2 micrograys)*** per hour at 10 centimeters from any surface.

(11) One microcurie ***(37 kilobequerels)*** of radium 226 per timepiece in timepieces acquired before February 28, 1980.

(b) Lock illuminators containing not more than 15 millicuries ***(555 megabequerels)*** of tritium or not more than 2 millicuries ***(74 megabequerels)*** of promethium 147 installed in automobile locks. The levels of radiation from each lock illuminator containing promethium 147 must not exceed 1 millirad ***(10 micrograys)*** per hour at 1 centimeter from any surface when measured through 50 milligrams per square centimeter of absorber.

(c) Precision balances containing no more than 1 millicurie ***(37 megabequerels)*** of tritium per balance or 0.5 millicurie ***(18.5 megabequerels)*** of tritium per balance part.

(d) Automobile shift quadrants containing not more than 25 millicuries ***(925 megabequerels)*** of tritium.

(e) Marine compasses containing not more than 750 millicuries ***(27.75 gigabequerels)*** of tritium gas and other marine navigational instruments containing not more than 250 millicuries ***(9.25 gigabequerels)*** of tritium gas.

(f) Thermostat dials and pointers containing not more than 25 millicuries ***(925 megabequerels)*** of tritium per thermostat.

(g) Electron tubes, if each tube does not contain more than one of the following specified quantities of radioactive material:

(1) One hundred fifty millicuries ***(5.55 gigabequerels)*** of tritium per microwave receiver protector tube or 10 millicuries ***(370 megabequerels)*** of tritium per any other electron tube;

(2) One microcurie ***(37 kilobequerels)*** of cobalt 60;

(3) Five microcuries ***(185 kilobequerels)*** of nickel 63;

(4) Thirty microcuries ***(1.11 megabequerels)*** of krypton 85;

(5) Five microcuries ***(185 kilobequerels)*** of cesium 137; ~~[or]~~

(6) Thirty microcuries ***(1.11 megabequerels)*** of promethium 147 ~~[,]~~ ***; or***

(7) One microcurie (37 kilobequerels) of radium 226,

FLUSH and if the levels of radiation from each electron tube containing radioactive material do not exceed 1 millirad ***(10 micrograys)*** per hour at 1 centimeter from any surface when measured through 7 milligrams per square centimeter of absorber.

(h) Ionizing radiation measuring instruments containing, for purposes of internal calibration or standardization, a source of radioactive material not exceeding the applicable quantity in NAC 459.188.

2. For the purposes of NAC 459.180 to 459.314, inclusive, authority to transfer possession or control by the manufacturer, processor or producer of any equipment, device, commodity or other product containing source material or by-product material whose subsequent possession, use, transfer and disposal by all other persons are exempted from regulatory requirements may be obtained only from the Nuclear Regulatory Commission.

3. For the purposes of paragraph (g) of subsection 1, electron tubes include spark gap tubes, power tubes, gas tubes including glow lamps, receiving tubes, microwave tubes, indicator tubes,

pick-up tubes, radiation detection tubes and any other completely sealed tube that is designed to conduct or control electrical currents.

Sec. 56. NAC 459.192 is hereby amended to read as follows:

459.192 ~~[The following described self-luminous products containing radioactive material are exempted:]~~

1. Except for persons who manufacture, process or produce self-luminous products containing tritium, krypton 85 or promethium 147, any person is exempt from the provisions of NAC 459.010 to 459.950, inclusive, ***and sections 2 to 32, inclusive, of this regulation*** to the extent that he 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 Nuclear Regulatory Commission pursuant to 10 C.F.R. § 32.22 which license authorizes the transfer of the product to persons who are exempt from regulatory requirements. The exemption in this subsection for self-luminous products does not apply to tritium, krypton 85 or promethium 147 used in products for frivolous purposes or in toys or adornments.

2. Any person is exempt from the provisions of NAC 459.010 to 459.950, inclusive, ***and sections 2 to 32, inclusive, of this regulation*** to the extent that he receives, possesses, uses, transfers or owns articles containing less than 0.1 microcurie ***(3.7 kilobequerels)*** of radium 226 which were acquired before February 28, 1980.

3. Except for persons who manufacture, process or produce gas and aerosol detectors containing radioactive material, any person is exempt from the provisions of NAC 459.010 to 459.950, inclusive, ***and sections 2 to 32, inclusive, of this regulation*** to the extent that he 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 if the detectors containing radioactive material have been manufactured, imported or transferred in accordance with a specific license issued by the division, the Nuclear Regulatory Commission or any other agreement state pursuant to 10 C.F.R. § 32.26 or its equivalent, which authorizes the transfer of the detectors to persons who are exempt from regulatory requirements. The following also applies to gas and aerosol detectors containing radioactive material:

(a) The provisions of subsection 2 of NAC 459.190 apply to this subsection.

(b) Any gas and aerosol detector ***which contains by-product material, or naturally occurring and accelerator-produced radioactive material, and which was*** previously manufactured and distributed to general licensees in accordance with a specific license issued by an agreement state is exempt under this subsection if the device is labeled in accordance with the specific license and if the device meets the requirements of NAC 459.280.

4. ***Any person who receives, possesses, uses, transfers, owns or acquires capsules that contain carbon 14 urea is exempt from the provisions of NAC 459.180 to 459.314, inclusive, if each capsule:***

(a) Is intended solely for in vivo diagnostic use in humans and is not used for research involving human subjects; and

(b) Contains, allowing for nominal variation that may occur during the manufacturing process, not more than 1 microcurie (37 kilobequerels) of carbon 14 urea.

FLUSH ***Nothing in this subsection relieves a person from complying with any other federal, state or local requirement governing the receipt, administration or use of drugs.***

5. Any person who receives, possesses, uses, transfers, owns or acquires synthetic plastic resins containing scandium 46 which are designed for sand consolidation in oil wells is exempt

from the provisions of NAC 459.010 to 459.950, inclusive, ***and sections 2 to 32, inclusive, of this regulation*** if the resins have been manufactured or imported in accordance with a specific license issued by the Nuclear Regulatory Commission or have been manufactured in accordance with the specifications contained in a specific license issued by the division or any agreement state to the manufacturer of resins pursuant to licensing requirements equivalent to those in 10 C.F.R. §§ 32.16 and 32.17 of the regulations of the Nuclear Regulatory Commission. This exemption does not authorize the manufacture of any resins containing scandium 46.

Sec. 57. NAC 459.1955 is hereby amended to read as follows:

459.1955 1. A plan for financing decommissioning, as described in subsection 8, must be submitted by each applicant for a license authorizing the possession and use of:

(a) Unsealed radioactive materials with a half-life of more than 120 days in quantities that exceed 10^5 times the applicable quantities set forth in NAC 459.362; or

(b) The involvement of a combination of radionuclides when R divided by 10^5 is greater than 1.

2. Each applicant for a specific license that authorizes the possession and use of radioactive material with a half-life of more than 120 days and in the quantities set forth in subsection 7 shall submit:

(a) A plan for financing decommissioning as described in subsection 8; or

(b) A certification which sets forth that financial assurance for decommissioning:

(1) Has been provided in the amount required by subsection 7 using one of the methods set forth in subsection 9; or

(2) Will be provided after the application has been approved and the license issued, but before the receipt of any licensed material by the licensee.

3. If an applicant:

(a) Defers the execution of the financial instrument until after the license has been issued pursuant to subparagraph (2) of paragraph (b) of subsection 2, the applicant shall submit to the division as part of the certification a signed original of the financial instrument used to comply with subsection 9 before the receipt of any licensed material.

(b) Does not defer the execution of the financial instrument until after the license has been issued, the applicant shall submit to the division as part of the certification a signed original of the financial instrument used by the applicant to comply with subsection 9.

4. An applicant for a specific license of the type described in subsection 1 or 2 shall submit a plan for financing decommissioning or a certification of financial assurance for decommissioning with his application.

5. The holder of a specific license that is issued before January 26, 1999, and:

(a) Of a type described in subsection 1, shall submit, on or before September 30, 1998, a plan for financing decommissioning or a certification of financial assurance for decommissioning in an amount not less than $750,000. If a certification of financial assurance is submitted, the licensee shall include a plan for financing decommissioning in an application for renewal of the license.

(b) Of a type described in subsection 2, shall submit, on or before September 30, 1998, a plan for financing decommissioning or a certification of financial assurance for decommissioning.

6. A licensee who has submitted an application for renewal of his license before January 26, 1999, in accordance with NAC 459.202, shall provide financial assurance for decommissioning in accordance with subsections 1 and 2 before September 30, 1998.

7. Financial assurance for decommissioning must be provided in accordance with the following amounts:

(a) Not less than $750,000 is required if:

(1) The amount of radioactive material is greater than 10^4, but less than or equal to 10^5 times the applicable quantities described in NAC 459.362, in unsealed form; or

(2) R, for a combination of radionuclides, divided by 10^4 is greater than 1 but R divided by 10^5 is less than or equal to 1.

(b) Not less than $150,000 is required if:

(1) The amount of radioactive material is greater than 10^3, but less than or equal to 10^4 times the applicable quantities described in NAC 459.362, in unsealed form; or

(2) R, for a combination of radionuclides, divided by 10^3 is greater than 1 but R divided by 10^4 is less than or equal to 1.

(c) Not less than $75,000 is required if:

(1) The amount of radioactive material is greater than 10^{10} times the applicable quantities described in NAC 459.362, in sealed sources or plated foils; or

(2) R, for a combination of radionuclides, divided by 10^{10} is greater than 1.

8. The plan for financing decommissioning must contain the following:

(a) An estimate of the costs of decommissioning the facility based on the decommissioning plan;

(b) A description of the method of assuring financing for decommissioning in compliance with subsection 9;

(c) A schedule for adjusting the estimate of costs and associated levels of funding periodically over the life of the facility; and

(d) A certification by the licensee that financial assurance for decommissioning has been provided in the amount of the cost estimate for decommissioning and a signed original of the financial instrument used to satisfy the requirements of subsection 9.

9. Financial assurance for decommissioning must be provided by one or more of the following methods:

(a) Prepayment in the form of a deposit of an amount of money in cash or liquid assets that would be sufficient to pay the costs of decommissioning before starting operations at the facility, into an account segregated from the assets of the licensee and outside the administrative control of the licensee. Prepayment may be in the form of a trust, escrow account, government fund, certificate of deposit or deposit of government securities.

(b) Provision of a surety that assures that the costs of decommissioning will be paid should the licensee fail to do so. A guarantee of money from a parent company of the licensee for the cost of decommissioning that is based on a financial test may be used if the guarantee and test meet the criteria set forth in subsection 12. Such a guarantee may not be used in combination with any other method of financing to satisfy the requirements of this subsection. A guarantee of money by the applicant or licensee for the cost of decommissioning that is based on a financial test may be used if the guarantee and test meet the criteria set forth in subsection 12. Such a guarantee must not be used in combination with any other method of financing to satisfy the requirements of this subsection or if the applicant or licensee has a parent company that holds a majority control of the voting stock of the applicant or licensee. Any surety used to provide financial assurance for decommissioning must contain the following conditions:

(1) The surety must be open-ended or, if written for a specified term, must be renewed automatically unless 90 days or more before the renewal date, the issuer notifies the division, the

beneficiary and the licensee of his intention not to renew. The surety must provide that the full-face amount will be paid to the beneficiary automatically before the expiration without proof of forfeiture if the licensee fails to provide a replacement acceptable to the division within 30 days after receipt of notification of the cancellation.

(2) The surety must be payable to a trust established for the costs of decommissioning the facility. The trustee and trust must be approved by the division. The division will approve as a trustee an appropriate agency of the state or Federal Government or an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by an agency of the state or Federal Government.

FLUSH A licensee shall maintain the surety in effect until the division has terminated his license.

(c) Provision of an external sinking fund in which deposits are made at least annually, coupled with a surety issued in compliance with the provisions of paragraph (b) except that the value of the surety may decrease by the amount being accumulated in the external sinking fund.

(d) If the licensee is a federal, state or local governmental agency, a statement of intent containing an estimate of the costs of decommissioning or an amount required by subsection 7 and an indication that money for decommissioning will be obtained when necessary.

10. A person licensed pursuant to NAC 459.180 to 459.314, inclusive, shall maintain the following records in an identified location until the site is released for unrestricted use:

(a) Records of spills or other unusual occurrences involving the spread of contamination in and around the facility, equipment or site. Such records must include, without limitation, the name, quantity, form and concentration of a nuclide involved in the spill or unusual occurrence.

(b) Drawings and other documents relating to:

(1) The modification of structures and equipment in restricted areas where radioactive materials are used and stored; and

(2) Locations where it is possible that contamination which is inaccessible has occurred, including, without limitation, areas of seepage into concrete and other porous materials.

(c) A list of all the areas:

(1) Designated and formerly designated as restricted areas;

(2) Outside of restricted areas that require documentation pursuant to paragraph (a);

(3) Outside of restricted areas where waste has been buried; and

(4) Outside of restricted areas which contain material that, if the license expired, the licensee would be required to decontaminate the area to unrestricted release levels or apply for approval for disposal pursuant to NAC 459.3595.

FLUSH ***If records important to the decommissioning of a facility are kept for other purposes, reference to these records and their locations may be used.***

11. Before licensed activities are transferred or assigned pursuant to subsection 2 of NAC 459.198, the licensee must transfer all the records described in paragraphs (a), (b) and (c) of subsection 10 to the licensee to whom the activities have been transferred or assigned. Such records ***become, upon receipt, the responsibility of the licensee to whom the activities have been transferred or assigned and*** must be retained ***by that licensee*** until ~~[the]~~ ***its*** license is terminated.

12. To pass the financial test referred to in subsection 9:

(a) A parent company must have:

(1) Two of the following three ratios:

(I) A ratio of total liabilities to net worth that is less than 2;

(II) A ratio of the sum of net income plus depreciation, depletion and amortization to total liabilities that is more than 0.1; and

(III) A ratio of current assets to current liabilities that is more than 1.5;

(2) Net working capital and tangible net worth that are each at least six times the current cost estimates for decommissioning or, if certification is used, the amount set forth in subsection 7; and

(3) Assets located in the United States that amount to at least 90 percent of the total assets of the parent company or at least six times the cost estimate for decommissioning or, if certification is used, the amount set forth in subsection 7; or

(b) A parent company must have:

(1) A rating for its most recent bond issuance of AAA, AA, A or BBB as issued by Standard and Poor's Ratings Services or a rating of Aaa, Aa, A or Baa as issued by Moody's Investors Service, Inc.;

(2) Tangible net worth of at least six times the current cost estimate for decommissioning, or, if a certification is used, the amount set forth in subsection 7; and

(3) Assets located in the United States that amount to at least 90 percent of the total assets of the parent company or at least six times the cost estimate for decommissioning.

13. The terms of a guarantee of a parent company must provide that:

(a) The guarantee will remain in force unless the guarantor sends notice of cancellation by certified mail to the licensee and the division. The guarantee may not be canceled until 120 days after the date the notice of cancellation is received by both the licensee and the division, as evidenced by the return receipts.

(b) If the licensee fails to provide alternate financial assurance as specified in this section within 90 days after receipt by the licensee and the division of a notice of cancellation of the guarantee from the guarantor, the guarantor must provide such alternate financial assurance in the name of the licensee.

(c) The guarantee and financial test provisions set forth in subsection 12 must remain in effect until the division has terminated the license.

(d) If a trust is established for the costs of decommissioning, the trustee and trust must be acceptable to the division. An acceptable trustee includes an appropriate state or federal agency or an entity that has the authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency.

14. A licensee who guarantees the costs of decommissioning ~~[shall]~~ ***must*** have:

(a) A tangible net worth of at least 10 times the total estimated cost of decommissioning or the current amount required for decommissioning;

(b) Assets located in the United States that amount to at least 90 percent of its total assets or at least 10 times the cost estimate for decommissioning;

(c) A rating for its most recent bond issuance of AAA, AA or A as issued by Standard and Poor's Ratings Services or a rating of Aaa, Aa or A as issued by Moody's Investors Services, Inc.; and

(d) At least one class of equity securities registered pursuant to the Securities Exchange Act of 1934.

15. A licensee shall ensure that a certified public accountant who is independent of the licensee compares the data used to satisfy the financial test as set forth in subsections 12 and 14. The data must be derived from audited, year-end financial statements for the last fiscal year. A

licensee shall inform the division within 90 days after matters which cause the certified public accountant to believe that the data used to satisfy the financial test should be adjusted and that the licensee or parent company, as applicable, can no longer pass the test. After the initial financial test, the licensee or parent company, as applicable, shall repeat the test within 90 days after the close of each fiscal year. If the parent company can no longer pass the test, the licensee must notify the division of its intent to establish alternate financial assurance as specified in this section. The notice must be sent by certified mail within 90 days after the close of the fiscal year. The licensee shall provide alternate financial assurance within 120 days after the close of such fiscal year.

16. If a bond issuance of the licensee or parent company, as applicable, ceases to be rated in a category of A or above by either Standard and Poor's Ratings Services or Moody's Investors Services, Inc., the licensee must notify the division in writing within 20 days after the rating. If the bond issuance ceases to be rated in a category of A or above by both Standard and Poor's Ratings Services and Moody's Investors Services, Inc., the licensee or parent company, as applicable, no longer meets the financial test as set forth in subsection 12.

17. The licensee shall provide to the division a written guarantee or commitment by a corporate officer which provides that the licensee will fund and complete the decommissioning of the facility or, upon issuance of an order by the ***state*** board of health, the licensee must establish a trust in the amount of the current cost estimates for decommissioning.

18. As used in this section:

(a) "External sinking fund" means a fund established and maintained by depositing money periodically in an account segregated from the licensee's assets and outside the licensee's administrative control in which the total amount of money to be accumulated before the

termination of the operation is expected is sufficient to pay the costs of decommissioning. The term includes, without limitation, a trust, escrow account, government fund, certificate of deposit or deposit of government securities.

(b) "R" equals the sum of the ratios of the quantity of each radionuclide to the applicable value as set forth in NAC 459.362.

(c) "Surety" includes, without limitation, a trust fund, surety bond, letter of credit, line of credit, insurance, guarantee of performance ~~[,]~~ or, except as otherwise provided in this section, any combination thereof.

Sec. 58. NAC 459.200 is hereby amended to read as follows:

459.200 1. Except as otherwise provided in ~~[subsection 2,]~~ ***subsections 2 and 3,*** a specific license expires at the end of the day on the date of expiration set forth on the license.

2. ***A specific license for which a licensee has, not less than 30 days before the date of expiration set forth on the license, filed an application for renewal pursuant to NAC 459.202 remains effective until the division makes a final decision on the application. If the decision is to deny the application for renewal, the license expires on the date of the decision or, if the division specifies a date of expiration in the decision to deny the application for renewal, on the date specified.***

3. A specific license revoked by the division expires on the date of the decision of the division to revoke the license or on the date specified in the decision of the division to revoke the license.

~~[3.]~~ ***4.*** A specific license continues in effect with respect to the possession of radioactive material until the division notifies the licensee in writing that the license is terminated. During the time the specific license continues in effect, the licensee shall:

(a) Limit actions involving radioactive material to those related to decommissioning; and

(b) Continue to control entry to restricted areas until they are suitable for release so that there is no undue hazard to public health and safety.

~~[4.]~~ ***5.*** Except as otherwise provided in subsection ~~[6,]~~ ***7,*** a licensee shall notify the division in writing within 60 days before:

(a) The decision of the licensee to cease permanently its principal activities at the entire site or in a separate building or outdoor area that contains residual radioactivity if the building or outdoor area is unsuitable for release because of an undue hazard to public health and safety;

(b) The end of a 24-month period in which no principal activities have been conducted pursuant to the license; or

(c) The end of a 24-month period in which no principal activities have been conducted in a separate building or outdoor area that contains residual radioactivity and the building or outdoor area is unsuitable for release because of an undue hazard to public health and safety.

~~[5.]~~ ***6.*** Coincident with the notification required by subsection ~~[4,]~~ ***5,*** the licensee shall maintain in effect all financial assurances for decommissioning established by the licensee pursuant to NAC 459.1955 in conjunction with the issuance or renewal of a license as required by this section. The amount of the financial assurance must be increased, or may be decreased, as appropriate, to meet the detailed cost estimate for decommissioning. After the division approves the plan for decommissioning, a licensee may reduce the amount of the financial assurance as decommissioning proceeds and radiological contamination is reduced at the site with the approval of the division.

~~[6.]~~ ***7.*** The division may grant a request to extend the period during which notification is required pursuant to subsection ~~[4]~~ ***5*** if the division determines that such an extension is not

detrimental to the public health and safety and is otherwise in the public interest. The request must be submitted not later than 30 days before notification is required pursuant to subsection ~~[4.]~~ ***5.*** The schedule for decommissioning may not commence until the division has made a determination on the request.

~~[7.]~~ ***8.*** A plan for decommissioning must be submitted to the division by the licensee if it is required by a condition of the license or if the procedures for decommissioning have not been approved by the division and these procedures could increase the potential impacts on the health and safety of workers or the public, including, without limitation, if:

(a) The procedures involve techniques not applied routinely during cleanup or maintenance operations;

(b) The workers would be entering areas not normally occupied where surface contamination and radiation levels are significantly higher than routinely encountered during normal operations;

(c) The procedures could result in a significantly greater airborne concentration of radioactive materials than is present during normal operations; or

(d) The procedures could result in a significantly greater release of radioactive material to the environment than that associated with normal operations.

FLUSH Such procedures may not be carried out by the licensee without being approved by the division before they commence.

~~[8.]~~ ***9.*** A proposed plan for decommissioning will be approved by the division if decommissioning will be completed as soon as practical, the health and safety of the workers and the public will be protected and the proposed plan for decommissioning includes:

(a) A description of the conditions of the site, separate building or outdoor area sufficient to evaluate the acceptability of the plan;

(b) A description of the decommissioning activities;

(c) A description of the methods that will be used to ensure the protection of workers and the environment against radiation hazards during decommissioning;

(d) A description of the planned final radiation survey;

(e) An updated and detailed cost estimate for decommissioning, comparison of that estimate with the money set aside for decommissioning and a plan for ensuring the availability of adequate money for completion of decommissioning; and

(f) For a plan for decommissioning in which completion of decommissioning will be later than 24 months after approval of the plan, a justification for the delay based on the criteria set forth in subsection ~~[11.~~

~~9.]~~ ***12.***

10. A licensee shall begin decommissioning of the site within 60 days after the plan for decommissioning is approved by the division.

~~[10.]~~ ***11.*** Except as otherwise provided in subsection ~~[11.]~~ ***12,*** a licensee:

(a) Shall complete decommissioning of the site, separate building or outdoor area as soon as practicable, but not later than 24 months after decommissioning begins.

(b) Must, if decommissioning involves an entire site, request termination of the license as soon as practicable, but not later than 24 months after decommissioning begins.

~~[11.]~~ ***12.*** The division may approve a request by the licensee for an extension of the period allowed for decommissioning or termination of a license if the division determines that such an extension is necessary because:

(a) It is not technically feasible to complete decommissioning within 24 months;

(b) There is not sufficient capacity for waste disposal to allow completion of decommissioning within 24 months;

(c) A significant reduction in the volume of wastes requiring disposal will be achieved by allowing short-lived radionuclides to decay;

(d) A significant reduction in radiation exposure to workers can be achieved by allowing short-lived radionuclides to decay; or

(e) There are other site-specific factors that make decommissioning within 24 months undesirable or unfeasible, including, without limitation, the regulatory requirements of other government agencies, lawsuits, activities involving the treatment of ground water, monitored restoration of natural ground water, actions that could result in more environmental harm than deferred cleanup and other factors beyond the control of the licensee.

~~[12.]~~ ***13.*** As the final step in decommissioning, the licensee shall ~~[:~~

~~(a) Certify]~~ ***certify*** the disposition of all licensed material, including, without limitation, accumulated wastes, by submitting to the division a completed NRC Form 314 or information that is equivalent to that contained in the completed form ~~[.~~

~~(b)]~~ ***and:***

(a) Demonstrate that the premises where the licensed activities were carried out satisfy the criteria for decommissioning set forth in sections 3, 5, 7, 11 and 17 to 25, inclusive, of this regulation; or

(b) Conduct a radiation survey of the premises ~~[where the licensed activities were carried out]~~ and submit to the division a report of the results of this survey ***.*** ~~[unless the licensee demonstrates that the premises are suitable for release in some other manner.]~~ The radiation survey must ***demonstrate that the premises are suitable for release and*** include:

(1) A description of the levels of gamma radiation in units of ~~[millisieverts (microroentgen)]~~ ***millirem (millisievert)*** per hour at 1 meter from surfaces;

(2) A description of the levels of radioactivity, including, without limitation, alpha and beta radiation, in units of:

(I) ~~[Megabecquerels (disintegrations per minute or microcuries)]~~ ***Microcuries (megabequerels)*** per 100 square centimeters, removable and fixed, for surfaces;

(II) ~~[Megabecquerels (microcuries)]~~ ***Microcuries (megabequerels)*** per milliliter for water; and

(III) ~~[Becquerels (picocuries)]~~ ***Picocuries (bequerels)*** per gram for solids, including, without limitation, soils and concrete; and

(3) A description of the survey instruments used and a statement that each instrument was properly calibrated and tested. The statement must be certified by the person who calibrated and tested the instrument.

~~[13.]~~ ***14.*** A specific license, including an expired license, will be terminated by written notice to the licensee that the division has determined that ~~[all]~~ ***:***

(a) All radioactive material has been disposed of properly ~~[, reasonable]~~ ***;***

(b) Reasonable effort has been made by the licensee to eliminate residual radioactive contamination, if present ~~[, and:~~

~~(a)]~~ ***;***

(c) All records required to be maintained pursuant to subsection 10 of NAC 459.1955 have been received by the division; and

(d) The radiation survey performed by the licensee ~~[demonstrates that the premises are suitable for release because there is not an undue hazard to public health and safety; or~~

~~(b) Information~~] ***or other information*** submitted by the licensee ~~[is sufficient to demonstrate]~~ ***demonstrates*** that the premises are suitable for release ~~[because there is not an undue hazard to public health and safety.]~~ ***in accordance with the criteria for decommissioning set forth in sections 3, 5, 7, 11 and 17 to 25, inclusive, of this regulation.***

Sec. 59. NAC 459.210 is hereby amended to read as follows:

459.210 1. Subject to the provisions of NAC 459.010 to 459.950, inclusive, ***and sections 2 to 32, inclusive, of this regulation,*** a person who holds a specific license from the Nuclear Regulatory Commission or an agreement state 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 within this state the activities authorized in the specific license for a period not in excess of 180 days in any calendar year provided that:

(a) The specific license does not limit the activity authorized by the specific license to specified installations or locations.

(b) The out-of-state licensee notifies the division in writing at least 3 business days before engaging in the proposed activity and receives written permission from the division to proceed with the proposed activity. The notification must indicate the location, period and type of proposed possession and use within the state, and must be accompanied by a copy of the specific license. If, for a specific case, the 3-day period would impose an undue hardship on the out-of-state licensee, he may apply to the division and obtain written permission to proceed sooner. The division 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 subsection 1.]~~

(c) The out-of-state licensee complies with all applicable regulations of the division and with all the terms and conditions of his specific license, except any terms and conditions which may be inconsistent with applicable regulations of the division.

(d) The out-of-state licensee supplies such other information as the division may request.

(e) The out-of-state licensee must not transfer or dispose of radioactive material possessed or used under the general license provided in this section except by transfer to a person:

(1) Specifically licensed by the division or by the Nuclear Regulatory Commission to receive such material; or

(2) Exempt from the requirements for a license for such material pursuant to NAC 459.184.

2. A licensee must determine the jurisdiction of a temporary jobsite at a federal facility before radioactive materials may be used at the temporary jobsite. If the jurisdiction is unknown, the licensee must contact the federal agency to determine whether the jobsite is under exclusive federal jurisdiction. The jurisdiction of the jobsite must be obtained in writing from the federal agency, or the name and title of the person at the federal agency who provided the determination must be recorded along with the date of the determination.

3. Before a licensee may use radioactive material at a temporary jobsite in another state or at a federal facility, the licensee must obtain authorization, if the jobsite is:

(a) In another state, from:

(1) That state, if that state is an agreement state; or

(2) The Nuclear Regulatory Commission, by filing for reciprocity or a specific license, if the state is not an agreement state ~~[.]~~ ***or the jobsite is within an area of exclusive federal jurisdiction.***

(b) At a federal facility, from the Nuclear Regulatory Commission by:

(1) Filing an NRC Form 241 in accordance with 10 C.F.R. § 150.20(b), as those provisions existed on January 26, 1999; or

(2) Filing for a specific license.

4. Any person who holds a specific license issued by the Nuclear Regulatory Commission or an agreement state authorizing the holder to manufacture, transfer, install or maintain a device described in NAC 459.216 within areas subject to the jurisdiction of the licensing body, is hereby granted a general license to install, transfer, demonstrate or maintain such a device in this state provided that:

(a) Such person shall file a report with the division within 30 days after the end of each calendar quarter in which any device is transferred to or installed in this state. Each such report must identify each general licensee to whom such 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 maintained in accordance with applicable provisions of the specific license issued to such person by the Nuclear Regulatory Commission or an agreement state;

(c) Such person must assure that any labels required to be affixed to the device under regulations 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 must furnish to each general licensee to whom he transfers such device or on whose premises he installs such device a copy of the general license contained in NAC 459.216.

5. The division may withdraw, limit or qualify its acceptance of any specific license or equivalent licensing document issued by another agency, or any product distributed pursuant to the licensing document, upon determining that such action is necessary in order to prevent undue hazard to public health and safety or property.

Sec. 60. NAC 459.256 is hereby amended to read as follows:

459.256 1. A licensee ~~[shall not]~~ ***may*** authorize ***the*** release from ~~[confinement for medical care]~~ ***its control of*** a natural person ~~[given]~~ ***who has been administered*** a radiopharmaceutical ~~[until:~~

~~(a) The measured dose rate from the natural person is less than 5 millirems per hour at a distance of 1 meter; or~~

~~(b) The activity in the natural person is less than 30 millicuries.~~

~~2. A licensee shall not authorize release from confinement for medical care a natural person given a permanent implant until the measured dose rate from the natural person is less than 5 millirems per hour at a distance of 1 meter.~~

~~3.]~~ ***, or a permanent implant that contains radioactive material, if the total effective dose equivalent to any other natural person from exposure to the person released is not likely to exceed 0.5 rem (5 millisieverts).***

2. A licensee may use any scientifically accepted method to calculate the total effective dose equivalent likely to be received by a natural person from a person released pursuant to subsection 1, including, without limitation, any method set forth in the Regulatory Guide 8.39 issued by the Nuclear Regulatory Commission entitled "Release of Patients Administered Radioactive Materials." If a licensee authorizes the release from its control of a person on the basis of a total effective dose equivalent that is calculated by a method using:

(a) The retained activity rather than the activity administered;

(b) An occupancy factor that is less than 0.25 at 1 meter;

(c) The biological or effective half-life of the radiopharmaceutical or radioactive material; or

(d) Considerations of the amount of shielding provided by tissue,

FLUSH ***the licensee shall maintain, for not less than 3 years after the date of release, a record of the basis for authorizing the release of the person.***

3. If the total effective dose equivalent to any other person from exposure to a natural person released from the control of a licensee pursuant to subsection 1 is likely to exceed 0.1 rem (1 millisievert), the licensee shall provide verbal and written instructions to the natural person concerning actions recommended by the division to maintain doses to which other persons may be exposed from the radiation emitted from the natural person to levels that are as low as is reasonably achievable.

4. If a licensee has reason to believe that a person released from its control pursuant to subsection 1 may expose an infant or child, by breast-feeding, to a total effective dose equivalent that is likely to exceed 0.1 rem (1 millisievert), the instructions provided pursuant to subsection 3 must include:

(a) Guidance on the interruption or discontinuation of breast-feeding; and

(b) Information on the consequences of failure to follow such guidance.

FLUSH ***If the exposure to an infant or child from breast-feeding is likely to exceed 0.5 rem (5 millisieverts), the licensee shall maintain, for not less than 3 years after the date of release, a record that these instructions were provided.***

5. Immediately after removing the last temporary implant source from a natural person, the licensee shall make a radiation survey of the natural person with a radiation detection survey instrument to confirm that all sources have been removed.

~~[4.]~~ ***6.*** A licensee shall not release from ~~[confinement for medical care]~~ ***its control*** a natural person treated by temporary implant until all sources have been removed.

~~[5.]~~ ***7.*** A licensee shall retain a record of the survey of natural persons for at least 3 years. Each record must include:

(a) The date of the survey;

(b) The name of the natural person;

(c) The dose rate from the natural person expressed as millirem ***(millisievert)*** per hour and measured at 1 meter from the natural person;

(d) The identity of the survey instrument used; and

(e) The initials of the person who made the survey.

~~[6.]~~ ***8.*** Using the survey data required pursuant to subsection ~~[5,]~~ ***7,*** the licensee shall calculate the total effective dose equivalent that a person who resides in the same house as the natural person is likely to receive from the natural person. If the licensee calculates that the total effective dose equivalent to any person from exposure to the released natural person could exceed 100 millirems ***(1 millisievert)*** in 1 year unless certain precautions are taken, the licensee shall provide verbal and written instructions to the natural person, which, if carefully followed by the natural person, should limit the exposure of other persons to the radiation emitted from the natural person to less than 100 millirems ***(1 millisievert)*** per year. If the natural person appears to have difficulty in understanding the instructions, the licensee shall contact a member of the

family of the natural person, his guardian or other representative until a person is found who can communicate the meaning of the instructions to the natural person.

~~[7.]~~ ***9.*** The licensee shall maintain for at least 3 years the records of a released natural person which must include a copy of the written instructions and the calculated total effective dose equivalent to the person likely to receive the highest dose.

Sec. 61. NAC 459.274 is hereby amended to read as follows:

459.274 Specific licenses of broad scope are subject to the following conditions:

1. Unless specifically authorized, persons licensed pursuant to NAC 459.262 may not:

(a) Conduct tracer studies in the environment involving direct release of radioactive material;

(b) Receive, acquire, own, possess, use or transfer devices containing 100,000 curies or more of radioactive material in sealed sources used for irradiation of materials;

(c) Conduct activities for which a specific license issued by the division under NAC 459.240 to ~~[459.260,]~~ ***459.258,*** inclusive, and 459.276 to 459.307, inclusive, is required; or

(d) Add or cause the addition of radioactive material to any food, beverage, cosmetic, drug, or other product designed for ingestion or inhalation by, or application to, a human being.

2. Each type A specific license of broad scope issued under NAC 459.180 to 459.274, inclusive, will be subject to the condition that radioactive material possessed under the license may only be used by, or under the direct supervision of **,** persons approved by the radiation safety committee of the licensee.

3. Each type B specific license of broad scope issued under this article is subject to the condition that radioactive material possessed under the license may only be used by, or under the direct supervision of **,** persons approved by the radiation safety officer of the licensee.

4. Each type C specific license of broad scope issued under this article is subject to the condition that radioactive material possessed under the license may only be used by, or under the direct supervision of ***,*** persons who satisfy the requirements of NAC 459.272.

Sec. 62. NAC 459.280 is hereby amended to read as follows:

459.280 An application for a specific license authorizing the incorporation of ***a naturally occurring or accelerator-produced*** radioactive material ***,*** other than source or by-product material ***,*** into gas and aerosol detectors to be distributed to persons exempt under NAC 459.192 will be approved if ~~[the]~~ ***:***

1. The application satisfies requirements equivalent to those contained in 10 C.F.R. § 32.26 of the regulations of the Nuclear Regulatory Commission ~~[.]~~ ***; and***

2. The amount of radium 226 to be incorporated in each device does not exceed 0.1 microcurie (3.7 kilobequerels).

Sec. 63. NAC 459.307 is hereby amended to read as follows:

459.307 1. Any licensee who possesses sealed sources shall have each sealed source containing radioactive material, other than hydrogen 3, with a half-life greater than 30 days in any form other than gas tested for leakage at intervals not to exceed 6 months, unless a longer interval is authorized by the division. In the absence of a certificate from a transferor indicating that a test has been made within 6 months prior to the transfer, the sealed sources should not be used until tested, but no leak tests are required when:

(a) The source contains 100 microcuries ***(3.7 megabequerels)*** or less of beta or gamma emitting material or 10 microcuries ***(370 kilobequerels)*** or less of alpha emitting material; or

(b) The sealed source is stored and is not being used ***.*** ~~[; the]~~ ***The*** sources must be tested for leakage prior to any use or transfer unless they have been leak tested within 6 months prior to the date of use or transfer.

2. The leak test must be capable of detecting the presence of 0.005 microcurie ***(185 bequerels)*** of radioactive material on the test sample. The test sample must be taken from the sealed source or from the surfaces of the device in which the sealed source is permanently mounted or stored on which contamination might be expected to accumulate. Records of leak test results must be kept in units of microcuries and maintained for 5 years for inspection by the division.

3. If the leak test reveals the presence of 0.005 microcurie ***(185 bequerels)*** or more of removable contamination, ***or 0.001 microcurie (37 bequerels) of radon 222 in a 24-hour period if the sealed source is a brachytherapy source manufactured to contain radium,*** the licensee shall immediately inform the radiological health section of the division by telephone, withdraw the sealed source, or the device in which it is permanently mounted, from use and cause it to be placed in locked storage. A report must be filed with the division within 5 days of the test describing the equipment involved, the test results and the location of the source.

Sec. 64. NAC 459.320 is hereby amended to read as follows:

459.320 1. ***The provisions of*** NAC 459.320 to 459.374, inclusive, establish standards for protection against radiation hazards. It is the purpose of those sections to control the receipt, possession, use, disposal and transfer of licensed or registered sources of radiation by any licensee or registrant in such a manner that the total dose to a natural person, including exposures to licensed or unlicensed or registered or unregistered sources of radiation, whether in the possession of the licensee, registrant or any other person, but not including exposure to radiation

from natural background sources ***,*** ~~[or]~~ medical diagnosis and therapy, ***natural persons who have been administered radiopharmaceuticals or have received permanent implants containing radioactive material and have been released from the control of a licensee pursuant to NAC 459.256, or voluntary participation in medical research*** does not exceed the standards of radiation protection set forth in ~~[those sections.]~~ ***NAC 459.320 to 459.374, inclusive.*** Those sections will not be construed as limiting actions that may be necessary to protect the health and safety of the public.

2. Except as otherwise specifically provided, NAC 459.320 to 459.374, inclusive, apply to all licensees or registrants. Those sections do not limit the intentional exposure of natural persons to radiation for the purpose of medical use or the intentional exposure of natural persons to radiation who are voluntarily participating in programs for medical research.

3. In addition to complying with the requirements set forth in NAC 459.320 to 459.374, inclusive, a licensee or registrant shall make every reasonable effort to maintain exposures and releases of radioactive materials in effluents to unrestricted areas, as low as is reasonably achievable.

Sec. 65. NAC 459.321 is hereby amended to read as follows:

459.321 ***1.*** Each licensee and registrant shall:

~~[1.]~~ ***(a)*** Develop, document and carry out a program for protection against radiation commensurate with the scope of its licensed or registered activities and sufficient to ensure compliance with the provisions of NAC 459.010 to 459.950, inclusive ~~[.~~

~~2.]~~ ***, and sections 2 to 32, inclusive, of this regulation.***

(b) Use, to the extent practicable, procedures and engineering controls ~~[for]~~ ***, based upon sound principles of*** protection against radiation ***,*** to achieve occupational doses and doses to members of the public ***that are*** as low as is reasonably achievable.

~~[3.]~~ ***(c)*** Review, at intervals not to exceed 12 months, the content and implementation of the program for protection against radiation.

2. A licensee or registrant shall, to achieve doses to members of the public that are as low as is reasonably achievable pursuant to paragraph (b) of subsection 1, establish a constraint on air emissions to the environment of radioactive material, excluding radon 222 and its decay products, such that the individual member of the public likely to receive the highest dose from such emissions will not be expected to receive a total effective dose equivalent in excess of 10 millirems (0.1 millisievert).

3. A licensee or registrant that causes, permits or is otherwise responsible for air emissions of radioactive material to the environment that exceed the constraint established pursuant to subsection 2 shall:

(a) Submit to the division the report required by NAC 459.371; and

(b) Promptly take appropriate corrective action to prevent any recurrence.

Sec. 66. NAC 459.325 is hereby amended to read as follows:

459.325 1. Except as otherwise provided in subsection 5, a licensee or registrant shall control occupational doses, except for planned special exposures, to ensure that no adult receives annually occupational doses in excess of the following limits:

(a) The lesser of:

(1) A total effective dose equivalent of 5 rems ~~[;]~~ ***(50 millisieverts);*** or

(2) 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, of 50 rems ~~[~~. ~~(b) An eye]~~ ***(500 millisieverts);***

(b) A lens dose equivalent of 15 rems ~~[.]~~ ***(150 millisieverts); and***

(c) A shallow-dose equivalent to the skin or to any extremity of 50 rems ~~[.]~~ ***(500 millisieverts).***

2. Occupational doses received in excess of the annual limits specified in subsection 1, including doses received during accidents, emergencies and planned special exposures, must be subtracted from the limits for planned special exposures that a person may receive during a current year and during his lifetime.

3. The deep-dose equivalent and shallow-dose equivalent must be for the portion of the body receiving the highest exposure. The deep-dose equivalent, ~~[eye]~~ ***lens*** dose equivalent and shallow-dose equivalent may be assessed from surveys or other radiation measurements for the purpose of demonstrating compliance with the limits for occupational doses, if the personnel monitoring equipment was not in the region of highest potential exposure, or the results of personnel monitoring are unavailable.

4. The derived air concentration and annual limit on intake values that are set forth in table I of appendix B may be used to determine the occupational dose of a person and to demonstrate compliance with the limits for occupational doses.

5. Notwithstanding the annual limits, a licensee shall limit a person’s intake of soluble uranium to 10 milligrams in 1 week.

6. The licensee or registrant shall reduce the occupational dose that a person is allowed to receive in a current year by the amount of the occupational dose that person received during the year while employed by another person.

Sec. 67. NAC 459.3255 is hereby amended to read as follows:

459.3255 1. If a licensee is required to monitor a person pursuant to subsections 1 and 2 of NAC 459.339, the licensee shall demonstrate compliance with the limits set forth in NAC 459.325 by adding external and internal doses. The licensee may demonstrate compliance with the requirements for summation of external and internal doses by meeting one of the conditions specified in subsection 2 and the conditions specified in subsections 3 and 4. The ~~[eye]~~ ***lens*** dose equivalent and the dose equivalents for the skin and the extremities are not required to be included in the summation, but are subject to separate limits set forth in NAC 459.325. If a licensee or registrant is required to monitor a person pursuant to subsection 1 of NAC 459.339 only or pursuant to subsection 2 of NAC 459.339 only, the summation of the doses is not required.

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

(a) The sum of the fractions of the annual limit on intake by inhalation for each radionuclide.

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

(c) The sum of the committed effective dose equivalents to all significantly irradiated organs or tissues, calculated from bioassay data using appropriate biological models and expressed as a fraction of the annual limit. For the purposes of this subsection, an organ or tissue shall be

deemed to be irradiated significantly if, for that organ or tissue, the product of the weighting factors and the committed dose equivalent, per unit intake, is greater than 10 percent of the maximum weighted value of the committed dose equivalent, per unit intake for any organ or tissue.

3. If a person who receives an occupational exposure also receives an intake of radionuclides by oral ingestion in an amount greater than 10 percent of the applicable annual limit on intake by oral ingestion, the licensee shall account for this intake and include it in demonstrating compliance with the limits set forth in NAC 459.325.

4. Except as otherwise provided in this subsection, the licensee shall evaluate and, to the extent practical, account for the intake of radiation through wounds or absorption through the skin. Any intake through intact skin is not required to be evaluated or accounted for pursuant to this subsection.

Sec. 68. NAC 459.327 is hereby amended to read as follows:

459.327 1. Licensees shall, when determining the external dose from airborne radioactive material, include the deep-dose equivalent, ~~[eye]~~ ***lens*** dose equivalent and shallow-dose equivalent caused by external exposure to the cloud of airborne radioactive material.

2. Measurements of airborne radioactive material and derived air concentration must not be used as the primary means to assess the deep-dose equivalent if 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 must be based upon measurements using instruments or personnel monitoring equipment.

Sec. 69. NAC 459.333 is hereby amended to read as follows:

459.333 1. Except as otherwise provided in subsection 4, a licensee or registrant shall ensure that the dose ***equivalent*** to an embryo during the entire pregnancy, resulting from occupational exposure of a woman who has declared her pregnancy, does not exceed 0.5 rem ~~[.]~~ ***(5 millisieverts).***

2. The licensee or registrant shall make efforts to avoid any substantial variation from a uniform monthly exposure rate to a woman who has declared her pregnancy so as to satisfy the limits specified in subsection 1 ***.*** ~~[of this section.]~~

3. The dose ***equivalent*** to an embryo ~~[must be calculated as]~~ ***is*** the sum of:

(a) The deep-dose equivalent to the woman who has declared her pregnancy; and

(b) The dose ***equivalent*** to the embryo ***resulting*** from radionuclides in the embryo and radionuclides in the woman who has declared her pregnancy.

4. If, by the time a woman declares her pregnancy to the licensee or registrant, the dose ***equivalent*** to the embryo has exceeded ~~[0.45 rem,]~~ ***0.5 rem (5 millisieverts), or is within 0.05 rem (0.5 millisievert) of that dose,*** the licensee or registrant shall be deemed to be in compliance with subsection 1 if ~~[an]~~ ***the*** additional dose ***equivalent*** to the embryo does not exceed 0.05 rem ***(0.5 millisievert)*** during the remainder of the pregnancy.

Sec. 70. NAC 459.335 is hereby amended to read as follows:

459.335 1. Except as otherwise provided in this section ~~[,]~~ ***and subsection 2 of NAC 459.321,*** each licensee and registrant shall conduct operations to ensure that:

(a) The total effective dose equivalent to any member of the public from its licensed or registered operation does not exceed 0.1 rem ***(1 millisievert)*** per year, not including the ***dose*** contribution from ***background radiation, any medical administration the member of the public has received, exposure to natural persons who have been administered radioactive material***

and have been released from the control of a licensee pursuant to NAC 459.256, voluntary participation in medical research, and the disposal by the licensee of radioactive material into sanitary sewerage in accordance with NAC 459.3605; and

(b) The dose in any unrestricted area from external sources ***, not including the dose contributions from natural persons who have been administered radioactive material and have been released from the control of a licensee pursuant to NAC 459.256,*** does not exceed 0.002 rem ***(0.02 millisievert)*** per hour.

2. A licensee, a registrant or an applicant for a license or registration may apply to the division for authorization to increase the limit set forth in paragraph (a) of subsection 1 to 0.5 rem ***(5 millisieverts)*** per year. The application must include:

(a) A statement of the need for and the expected duration of operations in excess of the limit specified in paragraph (a) of subsection 1;

(b) A description of the proposed program of the licensee or registrant to assess and control the dose within the annual limit of 0.5 rem; and

(c) The procedures to be followed to maintain the dose as low as is reasonably achievable.

3. The division may impose additional restrictions on radiation levels in unrestricted areas and on the total quantity of radionuclides that may be released in effluents in order to restrict the collective dose.

Sec. 71. NAC 459.337 is hereby amended to read as follows:

459.337 1. Each licensee and registrant shall make, or cause to be made, surveys that:

(a) Are necessary for the licensee or registrant to comply with NAC 459.010 to 459.950, inclusive ~~[;]~~ ***, and sections 2 to 32, inclusive, of this regulation;*** and

(b) Are necessary under the circumstances to evaluate:

(1) ~~[Radiation]~~ ***The magnitude and extent of radiation*** levels;

(2) Concentrations or quantities of radioactive material; and

(3) The potential radiological hazards **.** ~~[that could be present.]~~

2. The licensee or registrant shall ensure that instruments and equipment used for quantitative radiation measurements are calibrated for the radiation measured at intervals not to exceed 12 months.

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 dose of radiation and that are used by licensees and registrants to comply with NAC 459.325, with other applicable provisions of NAC 459.010 to 459.950, inclusive, ***and sections 2 to 32, inclusive, of this regulation*** or with conditions specified in a license or registration, must be processed and evaluated by a dosimetry processor who is accredited by the National Voluntary Laboratory Accreditation Program of the National Institute of Standards and Technology for the type of radiation or radiations included in the program that most closely approximate the type of radiation for which the person wearing the dosimeter is monitored.

4. The licensee or registrant shall ensure that adequate precautions are taken to prevent a deceptive exposure of personnel monitoring equipment.

Sec. 72. NAC 459.339 is hereby amended to read as follows:

459.339 Each licensee and registrant shall monitor exposures from sources of radiation at levels sufficient to demonstrate compliance with the limits for occupational doses specified in NAC 459.010 to 459.950, inclusive ~~[.]~~ ***, and sections 2 to 32, inclusive, of this regulation.*** As a minimum:

1. Each licensee and registrant shall monitor occupational exposure to radiation ***from licensed and unlicensed sources under the control of the licensee or registrant*** and shall supply and require the use of personnel monitoring equipment by:

(a) Adults who are likely to receive in 1 year, from sources of radiation external to the body, a dose in excess of 10 percent of the limits specified in NAC 459.325;

(b) Minors ~~[and women who have declared their pregnancy]~~ who are likely to receive in 1 year, from sources of radiation external to the body, a ***deep*** dose ***equivalent*** in excess of ~~[10 percent of any of the applicable limits specified in NAC 459.331 or 459.333; and]~~ ***0.1 rem (1 millisievert), a lens dose equivalent in excess of 0.15 rem (1.5 millisieverts), or a shallow dose equivalent to the skin or extremities in excess of 0.5 rem (5 millisieverts);***

(c) ***Women who have declared their pregnancy and are likely to receive, during the entire pregnancy, from sources of radiation external to the body, a deep dose equivalent in excess of 0.1 rem (1 millisievert); and***

(d) Any person entering a high or very high radiation area.

2. Each licensee shall monitor, to determine compliance with NAC 459.3275, the occupational intake of radioactive material by and assess the committed effective dose equivalent to:

(a) Adults who are likely to receive, in 1 year, an intake in excess of 10 percent of the applicable annual limit on intake in columns 1 and 2 of table I of appendix B; ~~[and]~~

(b) Minors ~~[and women who have declared their pregnancy]~~ who are likely to receive, in 1 year, a committed effective dose equivalent in excess of ~~[0.05 rem.]~~ ***0.1 rem (1 millisievert); and***

(c) Women who have declared their pregnancy and are likely to receive, during the entire pregnancy, a committed effective dose equivalent in excess of 0.1 rem (1 millisievert).

Sec. 73. NAC 459.3565 is hereby amended to read as follows:

459.3565 1. A licensee or registrant is not required to post signs pursuant to NAC 459.3555 in an area or room containing sources of radiation for periods of less than 8 hours if:

(a) The sources of radiation are constantly attended during these periods by a person who takes the precautions necessary to prevent the exposure of persons to sources of radiation in excess of the limits established in NAC 459.325, 459.331, 459.333 and 459.335; and

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

2. ~~[Rooms or other areas in hospitals that are occupied by patients are]~~ ***A room or other area in a hospital that is occupied by a patient is*** not required to be posted with signs pursuant to NAC 459.3555 if:

(a) The patient is being treated with sealed sources of radiation or has been treated with unsealed radioactive material in quantities of less than 30 millicuries ~~[,]~~ ***(1.11 gigabequerels),*** or the measured dose rate at 1 meter from the patient is less than 0.005 rem ***(0.05 millisievert)*** per hour; ~~[and]~~

(b) ***The licensee is authorized to release the patient from confinement pursuant to NAC 459.256; and***

(c) There are personnel in attendance who will take the necessary precautions to prevent the exposure of persons to radiation or radioactive materials in excess of the limits specified in NAC 459.325, 459.331, 459.333 and 459.335, and to maintain the level of radiation at a level which is as low as is reasonably achievable.

3. A room or area is not required to be posted with signs pursuant to NAC 459.3555 because of the presence of a sealed source of radiation if the level of radiation at 30 centimeters from the

surface of the container or housing for the sealed source does not exceed 0.005 rem ***(0.05 millisievert)*** per hour.

4. A room in a hospital or clinic that is used for teletherapy is not required to be posted with signs pursuant to NAC 459.3555 if:

(a) The licensee controls access to the room as required by NAC 459.3901; and

(b) There are personnel in attendance who will take the necessary precautions to prevent the exposure of any person to radiation or radioactive materials in excess of the limits established in NAC 459.325, 459.331, 459.333 and 459.335, and to maintain the level of radiation at a level that is as low as is reasonably achievable.

Sec. 74. NAC 459.3625 is hereby amended to read as follows:

459.3625 1. Except as otherwise provided in subsection ~~[4,]~~ ***5,*** each licensee and registrant shall use the units curie, rad, rem and roentgen, including multiples and subdivisions thereof, to prepare the records required by NAC 459.010 to 459.950, inclusive, ***and sections 2 to 32, inclusive, of this regulation*** and shall clearly indicate the units of all quantities entered on those records.

2. The licensee or registrant shall make a clear distinction among the quantities entered on the records required by NAC 459.010 to 459.950, inclusive ~~[.]~~ ***, and sections 2 to 32, inclusive, of this regulation, including, without limitation:***

(a) Committed effective dose equivalent;

(b) Deep-dose equivalent;

(c) Lens dose equivalent;

(d) Shallow-dose equivalent; and

(e) Total effective dose equivalent.

3. ***The licensee may record, in parentheses following the unit measurements required pursuant to subsection 1, the equivalent quantities expressed as unit measurements pursuant to the International System of Units (SI).***

4. A discontinuance or curtailment of the activities of a licensee or registrant does not relieve that licensee or registrant of the responsibility for retaining all records required by NAC 459.010 to 459.950, inclusive ~~[.]~~ ***, and sections 2 to 32, inclusive, of this regulation.*** A licensee or registrant may request the division to retain such records. An acceptance of the records by the division relieves the licensee or registrant of subsequent responsibility only in respect to their retention as required by this section.

~~[4.]~~ ***5.*** Each licensee or registrant shall use to prepare shipment manifests required pursuant to NAC 459.8231:

(a) The International System of Units (SI); or

(b) The International System of Units (SI) and the units set forth in subsection 1.

Sec. 75. NAC 459.3665 is hereby amended to read as follows:

459.3665 1. Each licensee and registrant shall maintain records of doses received by all persons for whom monitoring is required pursuant to NAC 459.339, and records of doses received by persons during planned special exposures, accidents and emergency conditions. These records must include, when applicable:

(a) The deep-dose equivalent to the whole body, ~~[eye]~~ ***lens*** dose equivalent, shallow-dose equivalent to the skin and shallow-dose equivalent to the extremities;

(b) The estimated intake of radionuclides;

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

(d) The specific information used to calculate the committed effective dose equivalent pursuant to NAC 459.3275 ~~[.]~~ ***and, when required, pursuant to NAC 459.339;***

(e) The total effective dose equivalent, when required pursuant to NAC 459.3255; and

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

2. The licensee or registrant shall make entries of the records specified in this section at intervals not to exceed 1 year.

3. The licensee or registrant shall maintain the records required pursuant to this section on a record of occupational exposure for a monitoring period, in accordance with the instructions for that form provided by the division.

4. The licensee or registrant shall maintain the records of doses to an embryo with the records of doses to the woman carrying the embryo who has declared her pregnancy. The records of the declaration of pregnancy, including the estimated date of conception, must also be maintained, but may be maintained separately from the records regarding doses.

5. The licensee or registrant shall retain each form or record required by this section until the division authorizes its disposal.

Sec. 76. NAC 459.3695 is hereby amended to read as follows:

459.3695 1. Each licensee and registrant shall immediately report to the division each event involving a source of radiation possessed by the licensee or registrant that may have caused, or threatens to cause:

(a) A person to receive:

(1) A total effective dose equivalent of 25 rems ***(250 millisieverts)*** or more;

(2) ~~[An eye]~~ ***A lens*** dose equivalent of 75 rems ***(750 millisieverts)*** or more; or

(3) A shallow-dose equivalent to the skin or extremities or a total organ dose equivalent of 250 rads ***(2.5 grays)*** or more.

(b) The release of radioactive material, inside or outside a restricted area, in a manner in which, had a person been present for 24 hours, the person could have received an intake of radiation that is five times the annual limit on intake for occupational exposure. The provisions of this paragraph do not apply to an area where personnel are not normally stationed during routine operations.

2. Except as otherwise provided in NAC 459.369, each licensee and registrant shall, within 24 hours after discovery, report to the division each event involving the 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:

(a) A person to receive, in a period of 24 hours:

(1) A total effective dose equivalent exceeding 5 rems ~~[~~;~~]~~

~~(2) An eye]~~ ***(50 millisieverts);***

(2) A lens dose equivalent exceeding 15 rems ~~[~~;~~]~~ ***(150 millisieverts);*** or

(3) A shallow-dose equivalent to the skin or extremities or a total organ dose equivalent exceeding 50 rems ~~[~~.~~]~~ ***(500 millisieverts).***

(b) The release of radioactive material, inside or outside a restricted area, in a manner in which, had a person been present for 24 hours, the person could have received an intake of radiation that is more than the annual limit on intake for occupational exposure. The provisions of this paragraph do not apply to an area where personnel are not normally stationed during routine operations.

3. The licensee or registrant shall prepare each report filed with the division pursuant to this section so that the names of persons who have received exposure are stated in a separate and detachable portion of the report.

4. Licensees or registrants shall make the reports required by subsections 1 and 2 to the division by telephone, telegram, mailgram or facsimile.

5. The provisions of this section do not apply to doses that result from planned special exposures, if such doses are within the limits for planned special exposures and are reported pursuant to NAC 459.371.

Sec. 77. NAC 459.371 is hereby amended to read as follows:

459.371 1. In addition to the notification required by NAC 459.3695, each licensee and registrant shall submit a written report to the division within 30 days after learning of any of the following occurrences:

(a) Incidents for which notification is required pursuant to NAC 459.3695.

(b) Doses in excess of:

(1) The limits for an occupational dose for an adult specified in NAC 459.325;

(2) The limits for an occupational dose for a minor specified in NAC 459.331;

(3) The limits for an embryo of a woman who has declared her pregnancy specified in NAC 459.333;

(4) The limits for a member of the public specified in NAC 459.335; ~~[or]~~

(5) Any applicable limits set forth in the license or registration ~~[.]~~ ***; or***

(6) The constraints on air emissions of radioactive material, excluding radon 222 and its decay products, specified in subsection 2 of NAC 459.321.

(c) Levels of radiation or concentrations of radioactive material in:

(1) A restricted area in excess of any applicable limits set forth in the license or registration; or

(2) An unrestricted area in excess of 10 times the applicable limits set forth in NAC 459.010 to 459.950, inclusive, ***and sections 2 to 32, inclusive, of this regulation*** or in the license or registration.

(d) For licensees subject to the provisions of the generally applicable environmental standards for radiation of the United States Environmental Protection Agency set forth in 40 C.F.R. Part 190, levels of radiation or releases of radioactive material in excess of those standards, or of conditions set forth in the license related to those standards.

2. Each report required pursuant to subsection 1 must describe the extent of exposure of persons to radiation and radioactive material, including, as appropriate:

(a) Estimates of the dose of each person;

(b) The levels of radiation and concentrations of radioactive material involved;

(c) The cause of the elevated exposures, dose rates or concentrations; and

(d) Corrective steps taken or planned to ensure against a recurrence, including ***, without limitation,*** the schedule for achieving conformance with applicable limits, ***constraints on air emissions of radioactive material, excluding radon 222 and its decay products, specified in subsection 2 of NAC 459.321,*** generally applicable environmental standards for radiation of the United States Environmental Protection Agency and associated conditions set forth in the license or registration.

3. Each report filed pursuant to this section must include, for each person exposed, his name, social security number and date of birth. With respect to reports of exposure to an embryo, the information must relate to the woman carrying the embryo. The report must be prepared so

that the information required by this subsection is stated in a separate and detachable portion of the report.

Sec. 78. NAC 459.3864 is hereby amended to read as follows:

459.3864 A licensee in possession of a sealed source, a brachytherapy source, except one containing iridium-192 encased in nylon, or a teletherapy source shall:

1. Test every source for leakage and report in accordance with the provisions of NAC 459.307 each source that is leaking. In the case of radium sources ~~[, the]~~ ***:***

(a) The leak test must ***, when the collection efficiency for radon 222 and its decay products has been determined with respect to the method, volume and time of collection,*** be capable of detecting the escape of radon at the rate of 0.001 microcurie ***(37 bequerels)*** per 24 hours.

(b) If the leak test is conducted on a brachytherapy source storage container for contamination from the decay products of radium, the test must:

(1) Be taken on the interior surface of the container; and

(2) Be capable of detecting the presence of 0.005 microcurie (185 bequerels) of any decay product of radium that has a half-life greater than 4 days.

(c) If the leak test on a radium source detects the escape of radon at the rate of 0.001 microcurie ***(37 bequerels)*** or more in 24 hours, the source must be considered to be leaking.

2. Conduct a physical inventory of all sealed sources in his possession, except any teletherapy source in teletherapy units, at least quarterly. The licensee shall retain each inventory record for at least 5 years. The records of inventory must contain the model number of each source, the serial number if one has been assigned, the identity of each source radionuclide and its nominal activity, and the signature of the radiation safety officer.

3. At least quarterly, conduct with a radiation detection instrument a survey of all areas where sealed sources are stored to determine ambient dose rates. This requirement is not applicable to teletherapy sources in teletherapy units.

4. Retain a record of each survey required in subsection 3 for at least 3 years. Each record must include:

(a) The date of the survey;

(b) A plan drawing of the area that was surveyed;

(c) The measured dose rate at several points in each area expressed in millirems per hour;

(d) The identity of the survey instrument used; and

(e) The signature of the radiation safety officer.

Sec. 79. NAC 459.3881 is hereby amended to read as follows:

459.3881 A licensee shall, for each patient or human research subject receiving implant therapy ~~[:]~~ ***, but not released from the control of the licensee pursuant to NAC 459.256:***

1. Ensure that the patient or human research subject is not placed in the same room with another patient or human research subject who is not receiving radiation therapy unless the licensee can demonstrate compliance with the requirements of NAC 459.335 if the dosage is measured 1 meter from the implant.

2. Post on the outside of the door to the room of the patient or human research subject a sign bearing the radiation symbol and the words “RADIOACTIVE MATERIALS,” and post a note on the door or in the chart of the patient or human research subject describing where and how long visitors may stay in the room of the patient or human research subject.

3. Authorize visits by persons under 18 years of age only on a case-by-case basis with the approval of the authorized user after he has consulted with the radiation safety officer.

4. Promptly after implanting the brachytherapy sources, survey the dose rate in contiguous restricted and unrestricted areas with a radiation survey instrument to demonstrate compliance with the limits of radiation specified for those areas. The licensee shall retain a record of each survey for at least 3 years. Each record must include:

(a) The time and date of the survey;

(b) A plan drawing of each area surveyed;

(c) The measured dose rate at several points expressed in millirems per hour;

(d) The identity of the survey instruments used to make the survey; and

(e) The initials of the person who performed the survey.

5. If the patient or human research subject was given a permanent implant, provide the patient or human research subject with radiation safety guidance that will help maintain the radiation dose to household members and the public as low as ***is*** reasonably achievable before releasing the patient or human research subject.

6. Notify the radiation safety officer immediately if the patient or human research subject dies or has a medical emergency.

Sec. 80. NAC 459.3924 is hereby amended to read as follows:

459.3924 1. Before medical use, after each installation of a teletherapy source, and after making any change for which an amendment of his license is required, a licensee shall perform radiation surveys with a portable radiation detection survey instrument to verify that:

(a) The maximum and average dose rates at a distance of 1 meter from the teletherapy source with the source in the "off" position and the collimators set for a normal treatment field do not exceed 10 millirems ***(0.1 millisievert)*** per hour and 2 millirems ***(0.02 millisievert)*** per hour, respectively; and

(b) With the teletherapy source in the "on" position with the largest clinically available treatment field and with a scattering phantom in the primary beam of radiation, the:

(1) Radiation dose ~~[quantities per unit of time]~~ ***rates*** in restricted areas are not likely to cause ~~[personnel exposures]~~ ***an occupational dose to an adult*** in excess of the limits specified in NAC 459.325; and

(2) Radiation dose ~~[quantities per unit of time]~~ ***rates*** in ***controlled or*** unrestricted areas ~~[do not exceed]~~ ***are not likely to cause a total effective dose equivalent to any member of the public in excess of*** the limits specified in NAC 459.335.

2. If the results of the surveys required by subsection 1 indicate any radiation dose quantity per unit of time in excess of the respective limit specified, the licensee shall lock the control in the "off" position and not use the unit:

(a) Except as may be necessary to repair, replace, or test the shielding of the unit or the shielding of the treatment room;

(b) Until the licensee can make effective engineering changes in the unit or treatment room or administrative changes in the size and usage of the restricted area which would bring the radiation dose quantity per unit of time or maximum potential exposure into compliance with the limits specified in subsection 1; or

(c) Until the licensee has received a specific exemption pursuant to NAC 459.120.

3. A licensee shall retain a record of the radiation measurements made following installation of a source for the duration of the license. Each record must include:

(a) The date of the measurements;

(b) The reason the survey is required;

(c) The identity of the manufacturer, model number and serial number of the teletherapy unit, the source, and the instrument used to measure radiation levels;

(d) Each rate of dosage measured around the teletherapy source while in the "off" position and the average of all measurements:

(e) A plan drawing of the areas surrounding the treatment room that were surveyed;

(f) The measured rate of dosage at several points in each area expressed in millirems per hour;

(g) The calculated maximum quantity of radiation over a period of 1 week for each restricted and unrestricted area; and

(h) The signature of the radiation safety officer.

Sec. 81. NAC 459.3927 is hereby amended to read as follows:

459.3927 1. If the survey required by NAC 459.3924 indicates that ~~[a person in an unrestricted area]~~ ***any member of the public*** may be exposed to levels of radiation greater than those permitted by NAC 459.335, the licensee shall, ***except as otherwise provided in subsection 2,*** before beginning a program of treatment:

(a) ~~[Equip the unit with stops, add additional shielding for radiation or redefine the boundaries of the restricted and unrestricted areas to ensure]~~ ***Ensure*** compliance with NAC 459.335 ~~[;]~~ ***by:***

(1) Equipping the unit with stops; or

(2) Adding additional radiation shielding;

(b) Perform the survey required by NAC 459.3924 again; and

(c) Include in the reports mailed to the division pursuant to NAC 459.393 the results of the initial survey, a description of the modifications made to comply with NAC 459.335, and the results of the second survey.

2. As an alternative to the requirements of subsection 1, the licensee may request a license amendment under NAC 459.204 that authorizes radiation levels in unrestricted areas greater than those permitted by NAC 459.335. The licensee may not begin the program of treatment until all of the reports mailed to the division pursuant to NAC 459.393 have been accepted as satisfactory by the division, or the requested amendment to the license has been issued.

Sec. 82. NAC 459.394 is hereby amended to read as follows:

459.394 Except as otherwise provided in NAC 459.3942, a licensee shall require the person fulfilling the responsibilities of the radiation safety officer as provided in NAC 459.3821:

1. ***To be an authorized user on the license of the licensee;***

2. To be certified by one of the following organizations:

(a) The American Board of Health Physics, in comprehensive health physics;

(b) The American Board of Radiology;

(c) The American Board of Nuclear Medicine;

(d) The American Board of Science, in nuclear medicine;

(e) The Board of Pharmaceutical Specialties, in nuclear pharmacy;

(f) The American Board of Medical Physics, in radiation oncology physics;

(g) The American Osteopathic Board of Radiology;

(h) The American Osteopathic Board of Nuclear Medicine; or

(i) The Royal College of Physicians and Surgeons of Canada, in nuclear medicine;

~~[2.]~~ ***or***

3. To have classroom and laboratory training and experience as follows:

(a) At least 200 hours of classroom and laboratory training that included:

(1) Radiation physics and instrumentation;

(2) Radiation protection;

(3) Mathematics pertaining to the use and measurement of radioactivity;

(4) Radiation biology; and

(5) Radiopharmaceutical chemistry; and

(b) At least 1 year of full-time experience as a radiation safety technologist at a medical institution under the supervision of the person identified as the radiation safety officer on a license issued by this state, the Nuclear Regulatory Commission or an agreement state that authorizes the medical use of radioactive material ***.*** ~~[; or~~

~~3. To be an authorized user on the license of the licensee.]~~

Sec. 83. NAC 459.570 is hereby amended to read as follows:

459.570 1. The exposure measured at the point where the center of the useful beam enters the patient must not exceed 10 roentgens ***(100 millisieverts)*** per minute, except during recording of fluoroscopic images or when provided with optional high level control.

2. When provided with optional high level control, the equipment must not be operable at any combination of tube potential and current which will result in an exposure rate ~~[in excess of 5 roentgens per minute]~~ ***, measured*** at the point where the center of the useful beam enters the patient ~~[unless the high level control is activated.]~~ ***, in excess of:***

(a) Five roentgens (50 millisieverts) per minute if the high level control is not activated; and

(b) Twenty roentgens (200 millisieverts) per minute if the high level control is activated and the unit was manufactured on or after May 19, 1995.

FLUSH Special means of activation of high level controls, such as additional pressure applied continuously by the operator, will be required to avoid accidental use. A continuous signal audible to the fluoroscopist must indicate activation and use of the high level control.

3. Any new equipment installed after February 28, 1980, which does not incorporate an automatic exposure control, for example, an automatic brightness control or ionization chamber control, must not be operable at any combination of tube potential and current which will result in an exposure rate in excess of 5 roentgens ***(50 millisieverts)*** per minute at the point where the center of beam enters the patient except during recording of fluoroscopic images or when provided with an optional high level control.

4. Compliance with this section is determined as follows:

(a) If the source is below the table, exposure rate must be measured 1 centimeter above the tabletop or cradle.

(b) If the source is above the table, the exposure rate must be measured at 30 centimeters above the tabletop with the end of the beam-limiting device or spacer positioned as closely as possible to the point of measurement.

(c) In a C-arm type of fluoroscope, the exposure rate must be measured 30 centimeters from the input surface of the fluoroscopic imaging assembly.

(d) In a miniature C-arm type of fluoroscope, the exposure rate must be measured with the end of the beam-limiting device or spacer positioned as closely as possible to the point of measurement.

(e) In a lateral type of fluoroscope, the exposure rate must be measured at a point 15 centimeters from the centerline of the tabletop and in the direction of the X-ray source, with the end of the beam-limiting device or spacer positioned as closely as possible to the point of measurement. If the tabletop is movable, it must be positioned as closely as possible to the lateral X-ray source.

5. Periodic measurements of the exposure rate must be made annually or after any maintenance of the system which might affect the exposure rate. ***If the equipment is provided with optional high level control, measurements of the exposure rates must be made both with and without the high level control activated.***

6. Results of these measurements must be made available at a place where any fluoroscopist will have ready access to them while using that fluoroscope. Results of the measurements must include the maximum possible r/minute, as well as the physical factors used to determine all data ***,*** ~~[;]~~ the name of the person performing the measurements ~~[;]~~ and the date the measurements were performed.

7. Use of monitoring devices, for example, commercially available film badges, ~~[thermoluminescent dosimeters,]~~ ***thermoluminescence dosimeters*** or low energy dosimeters ***,*** may be used to perform the test if the measurements are made as in subsection 8.

8. The measurement must be made under the conditions that satisfy the requirements of subsection 4:

(a) The kVp must be the peak kV that the X-ray system is capable of producing;

(b) ~~[The]~~ ***If determining the maximum dose rate below 5 roentgens (50 millisieverts) per minute, the*** high level control, if present, must not be activated;

(c) The X-ray system that incorporates automatic exposure control, for example, automatic brightness control, must have sufficient material, for example, lead or lead equivalent ***,*** placed in the useful beam to produce the maximum radiation output of the X-ray system; and

(d) The X-ray system that does not incorporate automatic exposure control must utilize the maximum milliamperage of the X-ray system. The material, for example, an attenuation block, must be placed in the useful beam to protect the imaging system.

Sec. 84. NAC 459.574 is hereby amended to read as follows:

459.574 1. During fluoroscopy and cinefluorography, X-ray tube potential and current must be continuously indicated.

2. ~~[The]~~ ***Except as otherwise provided in subsection 3, the*** source to skin distance must not be less than:

(a) Thirty-eight centimeters on stationary fluoroscopes installed after February 28, 1980;

(b) Thirty-five and five-tenths centimeters on stationary fluoroscopes which are in operation before February 28, 1980;

(c) Thirty centimeters on all mobile fluoroscopes; and

(d) Twenty centimeters for image intensified fluoroscopes used for specific surgical application. The users' operating manual must provide precautionary measures to be followed during the use of this device.

3. A fluoroscopy imaging system, including a small format type and miniature C-arm type, used to perform low power, X-ray image intensified fluoroscopy on extremities must:

(a) Be operated only by a licensed practitioner of the healing arts.

(b) Possess a positive, nonremovable means to ensure a source-skin distance during operation of not less than 9 centimeters, unless a different distance is approved by the Food and Drug Administration.

(c) Be clearly labeled as for use only on extremities.

(d) Bear a certification label that includes:

(1) The statement "This product is in conformity with the performance standards for diagnostic X-ray systems and their major components set forth in 21 C.F.R. § 1020"; and

(2) If the Food and Drug Administration grants a variance from any performance standards for diagnostic X-ray systems and their major components set forth in 21 C.F.R. § 1020, a statement of the variance and the identification number assigned to the variance by the Food and Drug Administration.

(e) Include an operating manual that contains:

(1) Any special instructions that may be necessary because of the unique features of the system, including, without limitation, special instructions concerning exposure rates, safety procedures and precautions; and

(2) Recommended machine settings for representative sample fluoroscopic examinations for which the system is designed, including data on skin and tabletop exposures resulting from these settings.

Sec. 85. NAC 459.650 is hereby amended to read as follows:

459.650 "Normal operating procedures" means operating procedures ~~[for conditions suitable for analytical purposes with shielding and barriers in place. Routine and emergency radiation safety considerations and routine alignment procedures are part of these procedures. Maintenance is not included in this term.]~~ ***necessary to accomplish the X-ray procedure being***

performed, including, without limitation, positioning of the equipment and the object being examined, alignment of the equipment, routine maintenance of the equipment and the procedures for recording data relating to radiation safety.

Sec. 86. NAC 459.656 is hereby amended to read as follows:

459.656 ***The provisions of*** NAC 459.640 to 459.664, inclusive, ~~[provide special]~~ ***establish*** requirements ***, binding upon registrants,*** for ***use of*** analytical X-ray equipment. These requirements are in addition to, and not in substitution for, other applicable requirements of NAC 459.010 to 459.794, inclusive.

Sec. 87. NAC 459.680 is hereby amended to read as follows:

459.680 As used in NAC 459.680 to ~~[459.736,]~~ ***459.733,*** inclusive, ***and sections 4, 6, 15, 16, 28, 29 and 30 of this regulation,*** unless the context otherwise requires, the words and terms defined in NAC ~~[459.681]~~ ***459.684*** to 459.703, inclusive, ***and sections 4, 6, 15 and 16 of this regulation*** have the meanings ascribed to them in those sections.

Sec. 88. NAC 459.684 is hereby amended to read as follows:

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

Sec. 89. NAC 459.688 is hereby amended to read as follows:

459.688 "Industrial radiography" ~~[means the examination of the macroscopic structure of materials by nondestructive methods utilizing sources of radiation.]~~ ***has the meaning attributed to it in 10 C.F.R. § 34.3.***

Sec. 90. NAC 459.7015 is hereby amended to read as follows:

459.7015 "Storage area" means any location, facility or vehicle used to store or secure ~~[a radiographic exposure device, storage container or sealed source]~~ ***an X-ray system*** when it is not in use.

Sec. 91. NAC 459.703 is hereby amended to read as follows:

459.703 "Temporary jobsite" means any place where sources of ***X-ray*** radiation are present and ***X-ray industrial*** radiography is performed. ~~[The term does not include a place where shielded-room radiography is performed.]~~

Sec. 92. NAC 459.704 is hereby amended to read as follows:

459.704 1. The provisions of NAC 459.680 to ~~[459.736,]~~ ***459.733,*** inclusive, ***and sections 4, 6, 15, 16, 28, 29 and 30 of this regulation*** establish radiation safety requirements for persons ~~[using sources of radiation for]~~ ***engaged in X-ray*** industrial radiography. These requirements are in addition to and not in substitution for other applicable requirements of NAC 459.010 to 459.950, inclusive ~~[.]~~ ***, and sections 2 to 32, inclusive, of this regulation.***

2. ***The provisions of*** NAC 459.680 to ~~[459.736,]~~ ***459.733,*** inclusive, ***and sections 4, 6, 15, 16, 28, 29 and 30 of this regulation*** apply to all ~~[licensees or]~~ registrants who ~~[use sources of radiation for industrial radiography. Except for the provisions of those sections which are clearly applicable only to sealed radioactive sources, both radiation machines and sealed radioactive~~

~~sources are covered by NAC 459.680 to 459.736, inclusive.]~~ ***engage in X-ray industrial radiography.***

Sec. 93. NAC 459.708 is hereby amended to read as follows:

459.708 1. ~~[Each source of radiation]~~ ***An X-ray system that is located in an unrestricted area*** must be provided with a lock ~~[or lockable outer container]~~ ***on the control panel of the system which is*** designed to prevent unauthorized ***use of the system*** or accidental production of radiation **.** ~~[or removal or exposure of a sealed source and must be kept locked at all times except when under the direct surveillance of a radiographer or radiographer's assistant. Each storage container for sealed sources and each source changer must be provided with a lock and kept locked when containing sealed sources unless the container or changer is under the direct surveillance of a radiographer or radiographer's assistant.~~

~~2. Radiographic exposure devices, source changers and storage containers, before being moved from one location to another or before being secured at a given location, must be locked and surveyed to ensure that the sealed source is in the shielded position.]~~

2. If an X-ray system, other than a cabinet X-ray system, is placed in a storage area, the X-ray system must be locked with the key removed.

Sec. 94. NAC 459.710 is hereby amended to read as follows:

459.710 ~~[Locked radiographic exposure devices, storage containers and radiation machines]~~ ***An X-ray system*** must be physically secured to prevent tampering or removal by unauthorized personnel.

Sec. 95. NAC 459.712 is hereby amended to read as follows:

459.712 1. The ~~[licensee or]~~ registrant shall maintain sufficient calibrated and operable radiation survey instruments ***at each location where radioactive producing equipment is used*** to

make ~~[physical]~~ ***the*** radiation surveys as required by NAC 459.337 and ~~[459.680 to 459.736, inclusive.]~~ ***section 31 of this regulation.*** Instrumentation required by this section must have a range such that 2 ~~[milliroentgens]~~ ***millirems (0.02 millisievert)*** per hour through 1 ~~[roentgen]~~ ***rem (0.01 sievert)*** per hour can be measured.

2. Each radiation survey instrument must be calibrated:

(a) Against appropriate energy at intervals not exceeding ~~[3]~~ ***6*** months and ***, except for battery changes,*** after each servicing of the instrument;

(b) So that accuracy within plus or minus 20 percent can be demonstrated ~~[,]~~ ***at each point checked;*** and

(c) At two or more widely separated points, other than zero, on each scale ~~[.]~~ ***, as follows:***

(1) For linear scale instruments, at two points located approximately one-third and two-thirds of full scale on each scale;

(2) For logarithmic scale instruments, at the mid-range of each decade and at two points of at least one decade; and

(3) For digital instruments, at 3 points between 2 millirems (0.02 millisievert) per hour and 1 rem (0.01 sievert) per hour.

3. Records of these calibrations must be maintained for at least 3 years after the calibration date for inspection by the division.

Sec. 96. NAC 459.716 is hereby amended to read as follows:

459.716 1. The ~~[licensee shall check for obvious defects in radiographic exposure devices, source changers and storage containers prior to]~~ ***registrant shall perform visual and operability checks of the indication lights and warning lights of an X-ray system before*** use each day the ~~[equipment is used.]~~ ***X-ray system is used to ensure that the X-ray system is in good working***

order. If this check reveals damage to or other problems with the X-ray system or any component thereof, the licensee or registrant shall make a record of the problem.

2. Each licensee shall conduct a program of at least ~~[quarterly]~~ ***semiannual*** inspection and ***routine*** maintenance of ~~[radiographic exposure devices, source changers and storage containers to ensure proper functioning of components important to safety. All appropriate parts must be maintained in accordance with manufacturer's specifications.]~~ ***X-ray systems and the components thereof, including, without limitation, interlocks, indication lights, exposure switches, warning lights and cables.***

3. Records of inspection and maintenance***, and records of defects or problems created pursuant to subsection 1,*** must be kept for inspection by the division ~~[until it authorizes their disposal.~~

~~3.]~~ ***for not less than 3 years.***

4. If any ***check or*** inspection conducted pursuant to ~~[subsection 1 reveals damage to components critical to radiation safety, the device]~~ ***this section reveals damage to or other problems with an X-ray system or any component thereof, the X-ray system*** must be removed from service until repairs have been made.

Sec. 97. NAC 459.7234 is hereby amended to read as follows:

459.7234 1. ~~[An application for a license or registration authorizing the use of a source of radiation for industrial radiography must include the name of the person who will act as the]~~ ***A registrant that engages in the practice of X-ray industrial radiography shall appoint a*** radiation safety officer for the radiographic operation.

2. A radiation safety officer ~~[must have:~~

~~(a) Completed the training and testing requirements set forth in subparagraph (1) of paragraph (a) and paragraphs (d), (e) and (f) of subsection 1 of NAC 459.723; and~~

~~(b) At least 2 years of experience in industrial radiography.~~

~~3. A radiation safety officer~~**]** shall:

(a) Ensure that the daily operation of ***X-ray*** industrial radiography is conducted in accordance with the provisions of this chapter.

(b) Establish and oversee operating and emergency procedures and procedures to ensure that the level of radiation is as low as is reasonably achievable. The radiation safety officer shall review these procedures at least once each year to ensure that the procedures conform to the requirements set forth in this chapter.

(c) Approve and oversee all phases of the training program for radiographic personnel to ensure that they receive training in appropriate and effective protection practices.

(d) Ensure that the required surveys **[**~~and tests for the leakage of radiation~~**]** are performed and documented in accordance with applicable regulations and that corrective measures are taken if the levels of radiation exceed the levels established in this chapter.

(e) Ensure that monitoring devices are calibrated and used properly by personnel who are performing ***X-ray*** industrial radiography and the results of exposures to radiation are properly recorded and notices of those exposures are submitted on a timely basis.

(f) Ensure that the radiographic operations are conducted safely and institute corrective actions if necessary, including terminating the operations in an emergency or if unsafe conditions exist.

Sec. 98. NAC 459.724 is hereby amended to read as follows:

459.724 1. ~~[The operating and emergency procedures of a licensee or registrant must include, without limitation, instructions in:~~

~~(a) The handling and use of sources of radiation to be employed so that no person is likely to be exposed to radiation doses in excess of the limits established in NAC 459.320 to 459.374, inclusive;~~

~~(b) Methods and occasions for conducting radiation surveys;~~

~~(c) Methods for controlling access to radiographic areas;~~

~~(d) Methods and occasions for locking and securing sources of radiation;~~

~~(e) The monitoring of personnel and the use of personnel monitoring equipment;~~

~~(f) Transportation to field locations, including packing sources of radiation in the vehicles, posting vehicles and controlling sources of radiation during transportation;~~

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

~~(h) The procedure for notifying proper personnel in the event of an accident;~~

~~(i) The maintenance of records; and~~

~~(j) The inspection and maintenance of radiographic exposure devices, source changers, storage containers and radiation machines.~~

~~2. Except as otherwise provided in this subsection, a licensee or]~~ ***A*** registrant shall not permit any person to ~~[act as a radiographer or as a radiographer's assistant]~~ ***operate an X-ray system to conduct X-ray industrial radiography*** unless, at all times during radiographic operations, the person wears a ~~[direct reading pocket dosimeter, an alarm rate meter and either a]~~ film badge or a ~~[thermoluminescent dosimeter. An alarm rate meter is not required to be worn for shielded-room radiography if other appropriate alarm or warning devices are used. Pocket]~~ ***thermoluminescence dosimeter and, if the X-ray industrial radiography takes place at a***

temporary jobsite or in a room or building that does not meet the requirements of NAC 459.335, a direct reading pocket dosimeter.

2. Direct reading pocket dosimeters must have a range from zero to ~~[200 milliroentgens]~~ ***200 millirems (2 millisieverts)*** and be recharged ~~[daily or]~~ at the start of each shift. Each film badge or ~~[thermoluminescent]~~ ***thermoluminescence*** dosimeter must be assigned to and worn by only one person ***.*** ~~[and]~~ ***A film badge*** must not be replaced less often than once a month. ***A thermoluminescence dosimeter must not be replaced less often than once every 3 months.***

3. ~~[Pocket]~~ ***Direct reading pocket*** dosimeters must be read and exposures recorded daily. A person's film badge or ~~[thermoluminescent]~~ ***thermoluminescence*** dosimeter must be immediately processed if his pocket dosimeter is discharged beyond its range. Reports received from the film badge or ~~[thermoluminescent]~~ ***thermoluminescence*** dosimeter processor and records of the pocket dosimeter readings must be maintained for inspection by the division ~~[until it authorizes their disposal.]~~ ***for not less than 3 years after the records are made.***

4. Each ***direct reading*** pocket dosimeter must be checked at periods not to exceed 1 year for response to radiation. To be acceptable, a dosimeter must read within plus or minus ~~[30]~~ ***20*** percent of the true radiation exposure.

5. ~~[Each alarm rate meter must:~~

~~(a) Be inspected before the start of each shift to ensure that the alarm functions properly and can be heard;~~

~~(b) Be set to give the alarm at a level of radiation that is preset at 500 milliroentgens per hour;~~

~~(c) Require a deliberate action to change the preset alarm;~~

~~(d) Be calibrated at periods not to exceed 1 year for correct response to radiation; and~~

~~(c) Give an alarm within plus or minus 20 percent of the true rate of the radiation dose.~~

~~6. A licensee or registrant shall provide periodic training for radiographers and radiographers' assistants at least once each calendar year.~~] ***If the ion-chamber pocket dosimeter of a person is found to be off scale, or if the electronic personal dosimeter of a person reads greater than 200 millirems (2 millisieverts), and the possibility of radiation exposure cannot be ruled out as the cause:***

(a) The film badge or thermoluminescence dosimeter of that person must be sent for processing within 24 hours; and

(b) The person shall not resume work with sources of radiation until a determination of his radiation exposure has been made.

6. For the purposes of this section, a person performing maintenance on an X-ray system shall be deemed to be operating the system if the X-ray beam is on at any time during the performance of the maintenance.

Sec. 99. NAC 459.733 is hereby amended to read as follows:

459.733 ~~[1.]~~ A licensee ***or registrant*** who is responsible for providing ***X-ray*** industrial radiography ~~[with sealed sources of radioactive material]~~ at a temporary jobsite ***or in a room or building that does not meet the requirements of NAC 459.335,*** shall ensure that ~~[at least two persons are performing the industrial radiography, one of whom is qualified as a radiographer and one of whom is qualified as a radiographer or a radiographer's assistant. Industrial radiography may not be performed at a temporary jobsite if only one qualified person is present.~~

~~2. A temporary jobsite must be~~] ***the temporary jobsite, room or building is*** under constant surveillance ~~[by a radiographer or radiographer's assistant]~~ and immediate action ~~[must be]~~ ***is***

taken by the person conducting the surveillance to prevent unauthorized entry into an area with high radiation.

Sec. 100. NAC 459.740 is hereby amended to read as follows:

459.740 1. ***The provisions of*** NAC 459.740 to 459.752, inclusive, establish procedures for the registration and the use of particle accelerators.

2. In addition to the requirements of NAC 459.740 to 459.752, inclusive, all registrants are subject to the requirements of NAC 459.010 to 459.166, inclusive, 459.320 to 459.374, inclusive, and 459.780 to 459.794, inclusive. Registrants engaged in ***x-ray*** industrial radiographic operations are subject to the requirements of NAC 459.680 to ~~[459.736,]~~ ***459.733,*** inclusive, ***and sections 4, 6, 15, 16, 28, 29 and 30 of this regulation,*** and registrants engaged in the healing arts are subject to the requirements of NAC 459.400 to 459.624, inclusive. Registrants engaged in the production of radioactive material are subject to the requirements of NAC 459.180 to 459.314, inclusive.

Sec. 101. NAC 459.7721 is hereby amended to read as follows:

459.7721 1. A licensee shall not permit a person to act as a logging supervisor or a logging assistant unless that person wears, at all times during the handling of radioactive materials, either a film badge or a ~~[thermoluminescent]~~ ***thermoluminescence*** dosimeter. Each film badge or ~~[thermoluminescent]~~ ***thermoluminescence*** dosimeter must be assigned to, and worn by, only one person. Film badges must be replaced at least once every month **,** and ~~[thermoluminescent dosimeter's]~~ ***thermoluminescence dosimeters*** must be replaced at least once every 3 months. After replacement, each film badge or ~~[thermoluminescent]~~ ***thermoluminescence*** dosimeter must be promptly processed.

2. A licensee shall provide bioassay services to persons using radioactive materials in subsurface tracer studies if required by his license.

3. A licensee shall retain records of film badge, ~~[thermoluminescent]~~ ***thermoluminescence*** dosimeter and bioassay results for inspection until the division authorizes disposition of the records.

Sec. 102. NAC 459.8231 is hereby amended to read as follows:

459.8231 1. A waste generator, waste collector or waste processor who transports or offers for transportation low-level radioactive waste intended for ultimate disposal at a licensed land disposal facility for low-level radioactive waste must, except as otherwise provided in subsection 2, prepare a manifest that includes the information requested on NRC Forms 540, 540A, 541 and 542, as applicable. NRC Forms 540 and 540A must be completed by the waste generator, waste collector or waste processor and must accompany the shipment. Upon agreement between the waste generator, waste collector or waste processor and the consignee, NRC Forms 541, 541A, 542 and 542A may be completed, transmitted and stored in electronic media with the capability of producing legible, accurate and complete records of the forms in the format of a uniform manifest.

2. A licensee is not required to comply with subsection 1 if the licensee ships:

(a) Low-level waste for processing and expects return of the waste before it is disposed of at a licensed land disposal facility;

(b) Low-level waste that is being returned to the licensee who is the ~~[waste generator or waste processor;]~~ ***generator;*** or

(c) Material that is contaminated with radioactivity to a waste processor and the waste becomes the residual waste of the waste processor.

3. A licensee who ships the radioactive waste shall provide the following information on the uniform manifest for each disposal container in the shipment:

(a) The name, address and telephone number of the licensee shipping the waste;

(b) A declaration of whether the licensee is acting as a waste generator, waste collector, waste processor or any combination thereof for the shipment;

(c) The name, address, telephone number and Environmental Protection Agency identification number of the carrier transporting the waste;

(d) The date of the shipment;

(e) The total number of packages and containers;

(f) The total volume and weight of the shipment;

(g) The total radionuclide activity in the shipment;

(h) The ***identity and*** activity of each of the radionuclides contained in the shipment, including, without limitation, the activity of any H-3, C-14, Tc-99 and I-129 contained in the shipment;

(i) The total masses of U-233, U-235 and plutonium in the material shipped ~~[;]~~ ***, including in any special nuclear material;***

(j) The total mass of uranium and thorium in the material shipped ~~[;]~~ ***, including in any source material;***

(k) The alphabetic or numeric identification that uniquely identifies each disposal container in the shipment;

(l) A physical description of the disposal container, including, without limitation, the name of the manufacturer and model of any high integrity container;

(m) The volume displaced by the disposal container;

(n) The gross weight of the disposal container and the waste contained therein;

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

(p) A physical and chemical description of the waste;

(q) The total percentage by weight of the chelating agent for any waste containing more than 0.1 percent by weight of a chelating agent and the name of the principal chelating agent;

(r) The approximate volume of waste within the container;

(s) The sorbing media or solidification media, if any, and the identity of the vendor and name of the brand of any solidification media;

(t) For discrete waste ~~[,]~~ ***types,*** including, without limitation, activated materials, contaminated equipment, mechanical filters, sealed sources and devices and wastes in solidification media or stabilization media, the identities and activities of individual radionuclides associated with or contained in the waste ~~[,]~~ ***types;***

(u) The total radioactivity within each container;

(v) For waste that is consigned to a disposal facility, the classification of the waste as set forth in NAC 459.8265; and

(w) The name of any waste that does not meet the structural stability requirements as set forth in NAC 459.8305.

4. A licensee who ships radioactive waste that is delivered without a disposal container must provide the following information on the manifest:

(a) The approximate volume and weight of the waste;

(b) A physical and chemical description of the waste;

(c) The total percentage by weight of the chelating agent for any waste containing more than 0.1 percent by weight of a chelating agent and the name of the principal chelating agent;

(d) For waste that is consigned to a disposal facility:

(1) The classification of the waste as set forth in NAC 459.8265; and

(2) The maximum radiation levels at the surface of the waste;

(e) The name of any waste that does not meet the structural stability requirements as set forth in NAC 459.8305; and

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

5. A licensee who ships disposal containers of mixtures of waste originating from different waste generators or mixtures of waste shipped without a container for which portions of the mixture within the shipment originate from different waste generators shall provide the following information on the manifest:

(a) For homogeneous mixtures of waste, including, without limitation, ash from an incinerator, the waste description applicable to the mixture and the volume of the waste attributed to each waste generator.

(b) For heterogeneous mixtures of waste, including, without limitation, the combined products from a large compactor, the identification of each waste generator contributing waste to the disposal container.

(c) For discrete waste ~~[,]~~ ***types,*** including, without limitation, activated materials, contaminated equipment, mechanical filters, sealed sources and devices, and wastes in

solidification media or stabilization media, the identities and activities of individual radionuclides contained in the waste ~~[.]~~ ***types.***

(d) For each waste generator:

(1) The volume of waste within the disposal container;

(2) A physical and chemical description of the waste, including, without limitation, the solidification media, if any;

(3) The total percentage by weight of the chelating agent for any disposal container containing more than 0.1 percent by weight of a chelating agent and the name of the principal chelating agent;

(4) The sorbing media or solidification media, if any, and the identity of the vendor and name of the brand of any solidification media if the media is claimed to meet stability requirements as set forth in NAC 459.8305; and

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

6. A licensee who ships radioactive waste shall ensure that an authorized representative certifies, by signing and dating the shipment manifest, that the materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the United States Department of Transportation and the division. By signing the certification, a waste collector certifies that the collected waste has not been tampered with in any manner that would invalidate the certification of the authorized representative of the licensee.

7. A licensee who ships radioactive waste shall provide on the required Environmental Protection Agency forms any information regarding hazardous, medical or other waste that is required to comply with Environmental Protection Agency regulations, as codified in 40 C.F.R. Parts ~~[259, 260 and 261, inclusive,]~~ ***260, 261 and 263,*** as those provisions existed on January 26, 1999. The required Environmental Protection Agency forms must accompany the uniform manifest required by this section.

8. Copies of the manifests required by this section may be legible carbon copies, photocopies or computer printouts that reproduce the data in the format of the uniform manifest. NRC Forms 540, 540A, 541, 541A, 542 and 542A and their instructions may be obtained at no charge from the Information and Records Management Branch, Office of Information Resources Management, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, telephone (301) 415-7232.

9. As used in this section:

(a) "EPA identification number" means the number received pursuant to 40 C.F.R. Part 263, as those provisions existed on January 26, 1999.

(b) "High integrity container" means a container used to meet the structural stability requirements of NAC 459.830 and the United States Department of Transportation requirements for shipping a package that contains a type A quantity of radioactive waste.

(c) "Waste description" means the physical, chemical and radiological description of the waste that is required on NRC Form 541.

Sec. 103. NAC 459.8235 is hereby amended to read as follows:

459.8235 1. Any licensee who transfers radioactive waste to a land disposal facility or to a licensed waste collector shall comply with all the requirements of this section. Any licensee who

transfers waste to a licensed waste processor for processing, treatment or repackaging shall comply with the requirements of paragraphs (d) to ~~[(h),]~~ ***(i),*** inclusive, of subsection 2.

2. A licensee shall:

(a) Prepare all wastes so that they are in compliance with the permitted classes of waste set forth in NAC 459.8265 and 459.830 and meet the requirements for stability set forth in NAC 459.8305;

(b) Label each disposal container or transport package to identify whether it contains Class A, Class B or Class C waste, as set forth in NAC 459.8265 and 459.827;

(c) Conduct a program of inspection, including managerial evaluation of audits, to ensure that the wastes conform to permitted classes and the requirements for physical form and packaging;

(d) Prepare the NRC uniform low-level radioactive waste manifest that contains the required information and certifications;

(e) Forward or electronically transfer a copy of the NRC uniform low-level radioactive waste manifest to the intended consignee so that the receipt of the manifest precedes the shipment or so that the manifest is delivered to the consignee with the waste at the time the waste is transferred to the consignee ***;*** ~~[and obtain acknowledgment of receipt of the shipment by the consignee in the form of a signed copy of NRC Form 540;]~~

(f) Include NRC Form 540 or NRC Form 540A, as applicable, with the shipment;

(g) ***Receive acknowledgment of the receipt of the shipment in the form of a signed copy of NRC Form 540;***

(h) Retain or electronically store a copy of the uniform low-level radioactive waste manifest and documentation of the acknowledgment of receipt as the required record of transfer of the licensed material; and

~~[(h)]~~ ***(i)*** For a shipment or part of a shipment for which an acknowledgment of its receipt has not been received within 20 days after the shipping date, conduct the investigation required pursuant to NAC 459.8255.

Sec. 104. NAC 459.824 is hereby amended to read as follows:

459.824 A waste collector who collects and handles only prepackaged waste shall:

1. Acknowledge receipt of the waste from the shipper by returning a signed copy of NRC Form 540 within 1 week after receiving the waste.

2. Prepare a new shipping manifest to reflect consolidated shipments that meets the requirements of NAC 459.8231. The waste collector shall ensure that for each container of waste in the shipment NRC Form 540 identifies the generator of that container of waste.

3. Comply with the provisions of paragraphs (e) to ~~[(h),]~~ ***(i),*** inclusive, of subsection 2 of NAC 459.8235.

4. Notify the shipper ***and division*** when any shipment or part of a shipment has not arrived within 60 days after receipt of an advanced manifest unless the waste collector is notified by the shipper that the shipment has been canceled.

Sec. 105. NAC 459.8245 is hereby amended to read as follows:

459.8245 A waste processor who processes, treats or repackages wastes shall:

1. Acknowledge receipt of the waste from the shipper by returning a signed copy of NRC Form 540 within 1 week after receipt of the waste.

2. Prepare a new shipping manifest which contains the required information and certificate, the preparation of which is acknowledgment that the waste processor is responsible for the waste. For each container of waste in the shipment, the manifest must set forth the waste

generator, the volume of preprocessed waste and any other information required pursuant to NAC 459.8231.

3. Prepare all wastes so that the waste is classified according to NAC 459.8265 and meets the requirements of NAC 459.830 and 459.8305.

4. Label each package of waste to identify whether it is Class A, Class B or Class C waste in accordance with NAC 459.8265.

5. Conduct a program of inspection, including a managerial evaluation of audits, to ensure that the waste conforms to permitted classes and the requirements for physical form and packaging.

6. Forward or electronically transfer a copy of the uniform low-level radioactive waste manifest to the consignee so that the manifest is received before or at the same time the shipment is delivered to the consignee. ~~[The waste processor shall obtain acknowledgment of receipt in the form of a copy of NRC Form 540 signed by the consignee.]~~

7. Include NRC Form 540 or Form 540A, as applicable, with the shipment.

8. ***Receive acknowledgment of the receipt of the shipment in the form of a signed copy of NRC Form 540;***

9. Retain or electronically store a copy of the uniform low-level radioactive waste manifest and documentation of acknowledgment of receipt as the required record of transfer of licensed material.

~~[9.]~~ ***10.*** For any shipment or part of a shipment for which an acknowledgment of its receipt has not been received within 20 days after the shipping date, conduct the investigation required by NAC 459.8255.

~~[10.]~~ ***11.*** Notify the shipper ***and division*** when any shipment or part of a shipment has not arrived within 60 days after receipt of an advanced manifest, unless the waste processor is notified by the shipper that the shipment has been canceled.

Sec. 106. NAC 459.260, 459.681, 459.682, 459.685, 459.686, 459.6865, 459.687, 459.689, 459.690, 459.692, 459.694, 459.696, 459.697, 459.698, 459.700, 459.7005, 459.701, 459.702, 459.706, 459.711, 459.713, 459.7135, 459.714, 459.718, 459.720, 459.722, 459.7225, 459.723, 459.7232, 459.726, 459.730, 459.732, 459.734 and 459.736 are hereby repealed.

TEXT OF REPEALED SECTIONS

459.260 Specific licenses: Sealed sources used in industrial radiography. In addition to the requirements set forth in NAC 459.238, a specific license for use of sealed sources in industrial radiography will be issued if:

1. The applicant agrees to have an adequate program for training radiographers and radiographers' assistants and submits to the division a schedule or description of such program which specifies the:

(a) Initial training;

(b) Periodic training;

(c) On-the-job training;

(d) Means to be used by the licensee to determine the radiographer's knowledge and understanding of and ability to comply with the division's regulations and licensing requirements, and the operating and emergency procedures of the applicant; and

(e) Means to be used by the licensee to determine the radiographer's assistant's knowledge and understanding of, and ability to comply with, the operating and emergency procedures of the applicant;

2. The applicant has established and submits to the division satisfactory written operating and emergency procedures;

3. The applicant has an adequate internal inspection system or other management control to assure that license provisions, regulations and the applicant's operating and emergency procedures are followed by radiographers and radiographers' assistants, and which:

(a) Includes observations of the performance of each radiographer and radiographer's assistant during an actual radiographic operation at intervals not to exceed 3 months;

(b) Provides that the performance of a radiographer or a radiographer's assistant who has not participated in a radiographic operation for more than 3 months since the last inspection must be observed and recorded the next time the person participates in a radiographic operation; and

(c) Includes the retention of records of inspection of the performance of radiographers and radiographers' assistants for 3 years;

4. The applicant submits to the division a description of his overall organizational structure pertaining to the industrial radiography program, including specified delegations of authority and responsibility for operation of the program;

5. The applicant who desires to conduct his own leak tests has established adequate procedures to be followed in leak testing sealed sources for possible leakage and contamination and submits to the division a description of the procedures including:

(a) Instrumentation to be used;

(b) Method of performing tests, for example, points on equipment to be smeared and method of taking the smear; and

(c) Pertinent experience of the person who will perform the test; and

6. The licensee agrees to conduct a program for inspection and maintenance of radiographic exposure devices and storage containers to ensure proper functioning of components important to safety.

459.681 "Associated equipment" defined. "Associated equipment" means any equipment used in conjunction with a radiographic exposure device to make radiographic exposures that drive, guide or come in contact with the source.

459.682 "Cabinet radiography" defined. "Cabinet radiography" means industrial radiography conducted in an enclosure or cabinet so shielded that every location on the exterior meets the conditions specified in NAC 459.335.

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

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

459.6865 "Exposure head" defined. "Exposure head" means a device that locates the sealed source of gamma radiation in a selected working area.

459.687 "Guide tube" defined. "Guide tube" means a flexible or rigid tube for guiding the source assembly and the attached control cable from the radiographic exposure device to the exposure head.

459.689 "Periodic training" defined. "Periodic training" means a review conducted or provided periodically by a licensee or registrant for his employees on safety requirements for persons using sources of radiation for industrial radiography.

459.690 "Personal supervision" defined. "Personal supervision" means supervision in which the supervisor is physically present at the site of the radiography and in such proximity to the person being supervised that direct communication with him can be maintained and immediate assistance given as required.

459.692 "Radiographer" defined. (NRS 459.030) "Radiographer" means any person who performs or provides personal supervision of industrial radiographic operations and who is responsible to the licensee or registrant for ensuring compliance with the requirements of the provisions of NAC 459.010 to 459.950, inclusive, and all conditions of the license or certificate or the registration.

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

459.696 "Radiographic exposure device" defined. "Radiographic exposure device" means an instrument which has a sealed source fastened or contained within the instrument, and the sealed source or its shielding may be moved or otherwise changed from a shielded to an unshielded position for purposes of making a radiographic exposure.

459.697 "Radiography" defined. "Radiography" means an examination of the structure of materials by nondestructive methods using a source of radiation.

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

459.700 "Shielded-room radiography" defined. "Shielded-room radiography" means industrial radiography conducted in a room so shielded that every location on the exterior meets the conditions specified in NAC 459.335.

459.7005 "Source assembly" defined. "Source assembly" means a sealed source and connector that can be attached to the control cable.

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

459.702 "Storage container" defined. "Storage container" means a device in which sealed sources are stored.

459.706 Equipment control: Limits on radiation levels for devices and storage containers.

1. Radiographic exposure devices measuring less than 4 inches from the sealed source storage position to any exterior surface of the device must not have a radiation level in excess of 50 milliroentgens per hour at 6 inches from any exterior surface of the device.

2. Radiographic exposure devices measuring a minimum of 4 inches 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, must not have a radiation level in

excess of 200 milliroentgens per hour at any exterior surface and 10 milliroentgens per hour at 1 meter from any exterior surface.

3. The radiation levels specified are with the sealed source in the shielded or "off" position.

4. The provisions of this section do not apply to any radiographic exposure device:

(a) Manufactured on or after January 21, 1994; or

(b) Used on or after January 10, 1996.

459.711 Equipment control: Storage areas. A storage area must be locked or have a physical barrier to prevent accidental exposure to radiation or any unauthorized tampering with or removal of the radiographic exposure device, storage container or sealed source stored in the area.

459.713 Equipment control: Radiographic exposure devices and associated equipment. (NRS 459.030)

1. Except as otherwise provided in subsections 2 and 3, a radiographic exposure device in which a sealed source of radioactive material is used and any associated equipment must comply with the requirements set forth in the American National Standards Institute Standard N43.9-1991, entitled "For Gamma Radiography - Specifications, Design and Testing of Apparatus," which is hereby adopted by reference. The publication may be purchased from the American National Standards Institute, 11 West 42nd Street, New York, New York 10036, for the price of $40 per copy.

2. Equipment that is used in industrial radiographic operation is not required to comply with paragraph 6.6.2 of the Endurance Test of the American National Standards Institute Standard N43.9-1991 if the equipment has been tested using a torque value representative of the torque

value that a natural person using the equipment can actually exert on the lever or crankshaft of the drive mechanism of the equipment.

3. An engineering analysis may be submitted by an applicant or licensee to demonstrate the applicability of a test that has been performed on similar components of radiographic equipment if the division determines, upon review, that the test is acceptable.

4. In addition to the requirements adopted pursuant to subsection 1, a radiographic exposure device and associated equipment must comply with the following requirements:

(a) A licensee who uses a radiographic exposure device shall attach to the device a durable, legible and clearly visible label that includes:

(1) The chemical symbol and mass number of the radionuclide in the device;

(2) The measurement of activity and the date on which this activity was last measured;

(3) The model number and serial number of the sealed source;

(4) The name of the manufacturer of the sealed source; and

(5) The name, address and telephone number of the licensee.

(b) A radiographic exposure device intended for use as a Type B transport container must comply with the applicable requirements adopted pursuant to NAC 459.910.

(c) A radiographic exposure device and associated equipment may not be modified in any manner.

5. In addition to the requirements adopted pursuant to subsection 1 and the requirements set forth in subsection 4, a radiographic exposure device and any associated equipment that allow the source to be moved out of the device for routine operations must comply with the following requirements:

(a) The coupling between the source assembly and the control cable must be designed in such a manner as to prohibit:

(1) The source assembly from becoming disconnected if cranked outside the guide tube.

(2) The coupling from being unintentionally disconnected under normal and reasonably foreseeable abnormal conditions.

(b) The radiographic exposure device must automatically secure the source assembly in the fully shielded position when it is cranked back into the radiographic exposure device. The release of the source assembly from the fully shielded position must require a deliberate operation on the radiographic exposure device.

(c) The fittings for outlets, the lock box and the fittings for drive cables on a radiographic exposure device must be equipped with safety plugs and covers. The safety plugs and covers must be installed during storage and transportation to protect the source assembly from water, mud, sand or other foreign matter.

(d) Each sealed source or source assembly must have attached to it or engraved upon it a durable, legible and visible label with the words “DANGER - RADIOACTIVE.” The label must not interfere with the safe operation of the radiographic exposure device or the associated equipment.

(e) The guide tube must have passed the crushing tests for the control tube as specified in the American National Standards Institute Standard N43.9-1991, and a kinking resistance test that closely approximates the kinking forces likely to be encountered during use.

(f) A guide tube must be used when moving the source out of the radiographic exposure device.

(g) An exposure head or other similar device designed to prevent the source assembly from passing out of the end of the guide tube must be attached to the outermost end of the guide tube during radiographic operations.

(h) The connection between the guide tube and the exposure head must be able to withstand the tensile strength for control units specified in the American National Standards Institute Standard N43.9-1991.

(i) A source changer must provide a system that ensures the source will not be accidentally withdrawn from the changer when connecting or disconnecting the drive cable to or from the source assembly.

6. The provisions of this section apply to:

(a) Any radiographic exposure device and associated equipment that is manufactured on or after January 21, 1994; and

(b) Any radiographic exposure device and associated equipment that is used after January 10, 1996.

459.7135 Equipment control: Report of incidents involving radiographic equipment.

1. In addition to any other reporting requirements set forth in this chapter, a licensee shall submit a written report to the division within 30 days after the occurrence of any of the following incidents involving radiographic equipment:

(a) An unintentional disconnection of the source assembly from the control cable.

(b) An inability to retract the source assembly to its fully shielded position and to secure it in this position.

(c) The failure of any component that is critical to the safe operation of radiographic equipment to perform properly its intended function.

2. A report submitted pursuant to subsection 1 must include:

(a) A description of the malfunction of the radiographic equipment;

(b) The cause of the incident, if known;

(c) The name of the manufacturer and the model number of the radiographic equipment;

(d) The place, time and date of the incident;

(e) A description of the actions taken to establish normal operations;

(f) A description of any corrective actions taken or planned to prevent a recurrence of the incident;

(g) The qualifications of personnel involved in the incident; and

(h) The dosimeter readings indicating the exposure to radiation of all persons involved in the incident.

459.714 Equipment control: Testing for leakage, 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 may be performed only by persons specifically authorized to do so by the division, the Nuclear Regulatory Commission or any agreement state.

2. Each sealed source must be tested for leakage at intervals not exceeding 6 months. In the absence of a certificate from a transferor that a test has been made within the 6-month period before the transfer, the sealed source must not be put into use until tested.

3. The leak test must be capable of detecting the presence of 0.005 microcurie of removable contamination on the sealed source. An acceptable leak test for sealed sources in the possession of a radiography licensee is to test at the nearest accessible point to the sealed source storage

position or other appropriate measuring point by a procedure approved pursuant to subsection 5 of NAC 459.260. Records of the results of a leak test must be kept in units of microcuries and maintained for inspection by the division for at least 3 years.

4. Any test conducted pursuant to subsections 2 and 3 which reveals the presence of 0.005 microcurie or more of removable radioactive material is evidence that the sealed source is leaking. The licensee shall immediately notify the radiological health section of the division by telephone, withdraw the equipment involved from use and place it in storage. Within 5 days after obtaining the results of the test, the licensee shall file a report with the division describing the equipment involved, the results of the test and the location of the equipment.

5. A sealed source which is not fastened to or contained in a radiographic exposure device must have permanently attached to it a durable tag at least 1 inch square bearing the prescribed caution symbol for radiation in conventional colors, magenta or purple on a yellow background, and the instructions:

DANGER

RADIOACTIVE MATERIAL

DO NOT HANDLE

NOTIFY CIVIL AUTHORITIES IF FOUND

459.718 Equipment control: Quarterly inventory. Each licensee shall conduct a quarterly physical inventory to account for all sealed sources received or possessed by him. The records of the inventories must be maintained for at least 3 years after the date of the inventory for inspection by the division and include the quantities and kinds of radioactive material, the location of sealed sources and the date of the inventory.

459.720 Equipment control: Utilization logs. Each licensee or registrant shall maintain current logs, which must be kept available for inspection by the division for at least 3 years after the date of the recorded event, showing for each source of radiation the following information:

1. A description or make and model number of each source of radiation or storage container in which the sealed source is located;

2. The identity of the radiographer to whom it was assigned; and

3. The locations where it was used and the dates of use.

459.722 Equipment control: Alarms at entrances.

1. In addition to the requirements in NAC 459.341, each entrance that may be used for access by personnel to a shielded room containing a high radiation area must be equipped with both visible and audible alarm signals to warn of the presence of radiation. The visible signal must be actuated by radiation whenever the source is exposed. The audible signal must be actuated when an attempt is made to enter the room while the source is exposed.

2. The visible and audible warning signals at each entrance to the shielded room must be tested for proper operation at the beginning of each period of use. Records of such tests must be maintained for inspection by the division until it authorizes their disposal.

459.7225 Examination to perform industrial radiography; issuance of identification card. (NRS 459.030)

1. A person who wishes to take the examination to perform industrial radiography for a licensee or registrant must apply to the division on a form prescribed and furnished by the division. The application must be accompanied by a nonrefundable fee in an amount equal to the division’s cost of administering the examination and must be received by the division at least 20 working days before the announced date of the examination.

2. A person whose identification card issued by the division has been suspended or revoked must obtain written approval from the division before applying to retake the examination.

3. The examination to perform industrial radiography for a licensee or registrant will be held at such times and places as are determined by the division. The division shall determine the scope of the examination, the methods by which it is administered and the passing grade. The examination must test the applicant's knowledge to use safely sources of radiation and related equipment in the practice of industrial radiography and his knowledge and ability to comply with the appropriate regulations of the division. All answers to the examination must be written in English.

4. An applicant may not be allowed to take the examination unless he presents an identification card with his picture on the card at the time of the examination.

5. A representative of the division shall proctor the examination and may terminate the examination of any person he believes is cheating.

6. The names and scores of persons taking the examination are public records.

7. The division shall issue to a person who passes the examination an identification card that is valid for 3 years. The identification card shall be deemed valid when the person to whom it is issued has his picture placed on the card at an office of the department of motor vehicles. A violation of any provision of NAC 459.010 to 459.950, inclusive, is a ground for the suspension or revocation of an identification card issued pursuant to this subsection.

459.723 Requirements for radiographers.

1. Except as otherwise provided in subsection 3, a licensee or registrant shall not permit a person to act as a radiographer until:

(a) The licensee or registrant has submitted evidence to the division that the person has:

(1) Successfully completed a course in the subjects set forth in NAC 459.726 that provides at least 40 hours of instruction. The course must be approved by the division, an agreement state or the Nuclear Regulatory Commission.

(2) Completed training while on the job as a radiographer's assistant that complies with the requirements set forth in subsection 2 or has at least 1 year of experience as a radiographer.

(b) The person has passed within the immediately preceding 3 years the appropriate examination that is administered by the division pursuant to NAC 459.7225, or an equivalent examination.

(c) The person has been issued an identification card by the division pursuant to NAC 459.7225 or an appropriate identification card by an agreement state. A radiographer shall have a valid identification card on his person at all times when he is performing radiography.

(d) The person has received copies of and instruction in the regulations contained in NAC 459.680 to 459.736, inclusive, and the applicable provisions of NAC 459.320 to 459.374, inclusive, and 459.780 to 459.794, inclusive, an appropriate license and the licensee's or registrant's operating and emergency procedures and has demonstrated an understanding thereof.

(e) The person has demonstrated competence to use the source of radiation, radiographic exposure device, related handling tools and radiation survey instruments which will be employed in his assignment.

(f) The person has demonstrated an understanding of the instructions received pursuant to this subsection by successfully completing a written examination and a field examination on the subjects covered.

2. Training while on the job as a radiographer's assistant must be under the supervision of one or more radiographers. The training must include at least 200 hours of active participation in

industrial radiography related to radioactive materials or 120 hours of active participation in industrial radiography related to X-ray machines. To perform industrial radiography related to radioactive materials and X-ray machines, a person must have completed both types of training. Hours spent in attendance at safety meetings or for training in the classroom may not be applied toward the hours required for training while on the job.

3. The division may waive the requirements of paragraphs (b) and (c) of subsection 1 for the first 90 days after a license is granted pursuant to NAC 459.210 to a radiographer from another state, or for the period required by that radiographer to perform radiography in this state during that time, whichever period is less. A waiver may be granted to a radiographer pursuant to this subsection one time only. At the end of the period of the waiver, the radiographer must comply with the requirements of paragraphs (b) and (c) of subsection 1 to perform industrial radiography in this state.

4. Each licensee or registrant shall maintain for inspection by the division until it authorizes their disposal, records of training and testing which demonstrate that the requirements of paragraphs (d), (e) and (f) of subsection 1 are met.

459.7232 Requirements for radiographer's assistants.

1. A licensee or registrant shall not permit a person to act as a radiographer's assistant until:

(a) The licensee or registrant has submitted evidence to the division that the person has successfully completed a course in the subjects set forth in NAC 459.726 that provides at least 40 hours of instruction. The course must be approved by the division, an agreement state or the Nuclear Regulatory Commission.

(b) The person has been issued an identification card by the division indicating his status as a radiographer's assistant.

(c) The person has received copies of and instruction in the licensee's or registrant's operating and emergency procedures and has demonstrated an understanding thereof.

(d) The person has demonstrated competence to use, under the personal supervision of a radiographer, the sources of radiation, radiographic exposure device, related handling tools and radiation survey instruments which will be employed in his assignment.

2. Whenever a radiographer's assistant uses radiographic exposure devices, sealed sources or related tools to handle sources, or conducts surveys of radiation to determine that a sealed source has been returned to the shielded position after an exposure, he must be under the personal supervision of a radiographer. The personal supervision must include:

(a) The radiographer's personal presence at the site where the sealed sources are being used;

(b) The ability of the radiographer to give immediate assistance if required; and

(c) The radiographer's watching the performance by the assistant of the operations referred to in this subsection.

3. Each licensee or registrant shall maintain for inspection by the division until it authorizes their disposal, records of training and testing which demonstrate that the requirements of paragraphs (c) and (d) of subsection 1 are met.

459.726 Topics for instruction of radiographers. The subjects to be taught during the instruction of radiographers are:

1. The fundamentals of radiation safety, including:

(a) Characteristics of gamma radiation;

(b) Units of radiation dose (mrem) and quantity of radioactivity (curie);

(c) Significance of radiation dose:

(1) Radiation protection standards; and

(2) Biological effects of radiation dose;

(d) Levels of radiation from sources of radiation;

(e) Methods of controlling radiation dose:

(1) Working time;

(2) Working distances; and

(3) Shielding; and

(f) Incident reports and case histories of radiography accidents.

2. The radiation detection instrumentation to be used, including:

(a) Use of radiation survey instruments:

(1) Operation;

(2) Calibration; and

(3) Limitations;

(b) Survey techniques; and

(c) Use of personnel monitoring equipment:

(1) Film badges;

(2) Thermoluminescent dosimeters;

(3) Pocket dosimeters; and

(4) Alarm ratemeters.

3. The radiographic equipment to be used, including:

(a) Remote handling equipment;

(b) Radiographic exposure devices and sealed sources;

(c) Storage containers and source changers; and

(d) Operation and control of X-ray equipment.

4. Inspection and maintenance of radiographic equipment which must be performed by radiographers.

5. The requirements of pertinent federal and state regulations.

6. The licensee's or registrant's written operating and emergency procedures.

459.730 Precautionary procedures: Posting. Areas in which radiography is being performed must be conspicuously posted as required by NAC 459.3555.

459.732 Radiation surveys and survey records.

1. No radiographic operation may be conducted unless calibrated and operable instruments for surveying radiation, as described in NAC 459.712, are available and used at each site where radiographic exposures are made.

2. A physical radiation survey must 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 must be surveyed. If the radiographic exposure device has a source guide tube, the survey must include the guide tube.

3. A physical survey of radiation must be made to determine that each sealed source is in its shielded position whenever a radiographic exposure device, storage container or source is stored, transported or secured when it is not in use. Any location, facility or vehicle used to store, transport or secure a device, container or source must be locked or have a physical barrier to prevent accidental exposure of, tampering with and unauthorized removal of the device, container or source. The entire circumference of the radiation exposure device must be surveyed.

4. Records must be made of the surveys required by subsection 3. The records must be maintained for inspection by the division for 3 years after completion of the survey. If a survey

was used to determine a person's exposure, the records of the survey must be maintained until the division authorizes their disposition.

459.734 Records required for temporary jobsites. Each licensee or registrant conducting industrial radiography at a temporary site shall have the following records available at that site for inspection by the division:

1. The appropriate license or certificate of registration or equivalent document;
2. Operating and emergency procedures;
3. Applicable regulations;
4. Survey records required pursuant to NAC 459.732 for the period of operation at the site;
5. Daily records for each pocket dosimeter 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.

459.736 Requirements and exemptions for enclosed radiography.

1. Systems for enclosed radiography designed to allow admittance of persons must:

(a) Comply with all applicable requirements of NAC 459.335 and 459.680 to 459.736, inclusive. If such a system is a certified cabinet X-ray system, it must comply with all applicable requirements of NAC 459.680 to 459.736, inclusive, and 21 C.F.R. § 1020.40.

(b) Be evaluated at intervals of not more than 1 year to ensure compliance with the applicable requirements specified in paragraph (a) of this subsection. Records of these evaluations must be maintained for inspection by the division for a period of 2 years after the evaluation.

2. Cabinet X-ray systems designed to exclude persons are exempt from the requirements of NAC 459.680 to 459.736, inclusive, except that:

(a) Operating personnel must be provided with film badges or thermoluminescent dosimeters and reports of the results must be maintained for inspection by the division.

(b) A registrant shall not permit any person to operate a cabinet X-ray system until the person has received a copy of instructions in the operating procedures for the unit and has demonstrated competence in its use. Records which demonstrate compliance with this subsection must be maintained for inspection by the division until disposition is authorized by the division.

(c) Tests for the proper operation of the control devices or alarm systems in an area of high radiation must, if applicable, be conducted and recorded in accordance with NAC 459.722.

(d) The registrant shall perform an evaluation, at intervals of not more than 1 year, to determine conformance with NAC 459.335. If a system is a certified cabinet X-ray system, it must be evaluated at intervals of not more than 1 year to determine conformance with 21 C.F.R. § 1020.40.

(e) Records of these evaluations must be maintained for inspection by the division for 2 years after the evaluation.

3. Certified cabinet X-ray systems must be maintained in compliance with 21 C.F.R. § 1020.40 unless prior approval has been granted by the division pursuant to NAC 459.120.

NOTICE OF ADOPTION OF PROPOSED REGULATION
LCB File No. R137-01

The Bureau of Health Protection Services of the Health Division of the Department of Human Resources adopted regulations assigned LCB File No. R137-01 which pertain to chapter 459 of the Nevada Administrative Code on March 28, 2003.

Notice date: 2/21/2003 & 2/25/2003 **Date of adoption by agency:** 3/28/2003
Hearing date: 3/28/2003 **Filing date:** 5/30/2003

INFORMATIONAL STATEMENT

1. A description of how public comment was solicited, a summary of public response, and an explanation how other interested persons may obtain a copy of the summary.

A memo was sent to all radioactive material licensees, the Medical Boards and affected x-ray registrants. In the memo, the recipients were notified of the process for obtaining a copy of the proposed amendments.

Public workshops were held as follows:

April 9, 2001 1:30 pm	State of Nevada Legislative Counsel Bureau Grant Sawyer State Office Building, Room 1412 555 E. Washington Avenue Las Vegas, NV
April 11, 2001 10:00 am	Nevada State Library and Archives Conference Room A 100 N. Stewart Street Carson City, NV
February 3, 2003 1:30 pm	State of Nevada Legislative Counsel Bureau Grant Sawyer State Office Building, Room 1412 555 E. Washington Avenue Las Vegas, NV
February 6, 2003 1: 30 pm	Washoe County Community Development Offices 1001 East 9th Street, Room A275 Reno, Nevada

Copies of the draft document were also available for public review at all county libraries and at the six field offices of the Bureau of Health Protection Services.

Legal Advertisements were run as follows:

Las Vegas Review Journal.....March 22, 2001
Reno Gazette.....March 22, 2001
Las Vegas Review Journal.....February 25, 2003
Reno Gazette.....February 21, 2003

2. The number of persons who:

(a) Attended the 2001 workshop	Las Vegas	0
	Reno	0
(b) Testified at the 2001 workshop:	Las Vegas	0
	Reno	0
(a) Attended the 2003 workshop	Las Vegas	10
	Reno	2
(b) Testified at the 2003 workshop:	Las Vegas	2
	Reno	1

(c) Submitted to the agency written statements:
No written statements were submitted to the agency.

3. A description of how comment was solicited from affected businesses, a summary of their response, and an explanation how other interested persons may obtain a copy of the summary.

A Small Business Impact questionnaire was mailed to all affected parties on November 20, 2001. No substantive comments were received.

4. If the regulation was adopted without changing any part of the proposed regulation, a summary of the reasons for adopting the regulation without change.

As required by the Governor's signed agreement with the U.S. Nuclear Regulatory Commission (USNRC), these proposed amendments are compatible with regulations of the USNRC, therefore allowing the state to assume the sole responsibility of issuing licenses under NRS 459 and NAC 459.

5. The estimated economic effect of the adopted regulation on the businesses, which it is to regulate, and on the public. These must be stated separately, and each case must include:

(a) Both adverse and beneficial effects (Business):

No adverse effects are anticipated as a result of these revisions and additions.

The beneficial effects anticipated as a result of this amendment are to allow more flexibility in meeting medical use requirements and requirements for financial assurance for decommissioning.

Both adverse and beneficial effects (Public):

No adverse effects on the public are anticipated as a result of these amendments.

The beneficial effects anticipated as a result of these revisions and additions are a reduction in the potential for public exposure to radiation as a result of prompt decommissioning requirements facilities for licensees who permanently cease licensed activities.

6. The estimated cost to the agency for enforcement of the proposed regulation.

Limited to the cost of printing new regulations.

7. A description of any regulations of other state or government agencies which the proposed regulation overlaps or duplicates, and a statement explaining why the duplication or overlapping is necessary. If the regulation overlaps or duplicates a federal regulation, the name of the regulating federal agency.

The proposed regulations do not overlap or duplicate any other Nevada state regulations. As required by the Governor's signed agreement with the U.S. Nuclear Regulatory Commission (USNRC), these proposed regulations are compatible with regulations of the USNRC, therefore allowing the state to assume and maintain the sole responsibility of issuing licenses under authorization of NRS 459 and NAC 459. Since the application for such a license is not subject to regulation by the USNRC, there is no duplication of federal regulations.

8. If the regulation includes provisions that are more stringent than a federal regulation, which regulates the same activity, a summary of such provisions.

N/A

9. If the regulation provides a new fee or increase an existing fee, the total annual amount the agency expects to collect and the manner in which the money will be used.

These amendments do not establish any new fees or increase any existing fees.

SMALL BUSINESS IMPACT STATEMENT

Proposed Regulations for Adoption by Nevada State Board of Health
R137-01
Board Hearing -- March 28, 2003
Pertaining to
Proposed Amendments to Nevada Administrative Code (NAC) 459

Background
Proposed NAC 459 regulation revisions.

The Bureau of Health Protection Services (BHPS) has determined that adoption of the proposed NAC 459 regulation revisions will impose a direct but not significant economic burden upon a small business and will not directly restrict the formation, operation or expansion of a small business in Nevada. A small business is defined in Nevada Revised Statutes (NRS) 233B as a "business conducted for profit which employs fewer than 150 full-time or part-time employees." This small business impact statement complies the requirements of NRS 233B.0609.

1. A description of the manner in which comment was solicited from affected small businesses, a summary of their response and an explanation of the manner in which other interested persons may obtain a copy of the summary.

A December 4, 2000 memo was sent to all licensees and registrants who could be or were known to be a small business as described above. The memo included a summary of proposed NAC 459 revisions and described the process for obtaining a complete copy of proposed regulation revisions.

In addition, BHPS staff were prepared to solicit comments regarding the Small Business Impact of the proposed regulation revisions at workshops held in Las Vegas on April 9, 2001 and February 3, 2003, and in Carson City on April 11, 2001 and February 6, 2003.

No comments regarding the economic/financial impact of the proposed regulation revisions were received in response to the memo or at the workshops.

2. The estimated economic effect of the proposed regulation on the small business which it is to regulate including, without limitation both adverse and beneficial effects and both direct and indirect effects.

The estimated direct beneficial economic effect of the proposed regulation on the small businesses is that maintaining compliance with these regulations could reduce the risk of any associated litigation.

The estimated indirect beneficial economic effect of the proposed regulations on the small businesses is that the regulation will provide for better protection of the health and safety of the

public by decreasing associated medical or other costs that may be incurred as a direct result increased radiation exposure.

The estimated direct adverse economic effect of the proposed regulations on the small businesses is that certain types of licensees may incur costs for additional recordkeeping. No costs for additional recordkeeping costs are estimated.

Estimated indirect adverse economic effects of the proposed regulations on the small businesses would only affect a small number of licensees and would need to be determined on a case-by-case basis.

3. A description of the methods that BHPS considered to reduce the impact of the proposed regulation on small businesses and statement regarding whether the agency actually used those methods.

In considering methods to reduce the impact of the proposed regulation on small businesses as required by NRS 233B.0608 2 (b) (2), the agency shall consider establishing different standards of compliance for a small business.

BHPS must adopt these regulations to maintain compatibility with the Governor's signed agreement with the U.S. Nuclear Regulatory Commission. This agreement does not allow the agency the ability to consider establishing different standards of compliance for a small business.

In considering methods to reduce the impact of the proposed regulation on small businesses as required by NRS 233B.0608 2 (b) (3), the agency shall consider modifying a fee or fine set forth in the regulation so that a small business is authorized to pay a lower fee or fine.

No fee or fine is set forth in the regulation.

4. The estimated cost to the agency for enforcement of the proposed regulation.

The estimated cost to the agency for enforcement of the proposed regulation is minimal.

5. Total amount BHPS expects to collect from any fees and the manner in which the money will be used.

BHPS expects to collect $0.00 from fees associated with the regulation.

6. An explanation of why any duplicative or more stringent provisions than federal, state or local standards regulating the same activity are necessary.

The proposed regulations do not overlap or duplicate any federal, state or local regulations.