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PROPOSED REGULATION OF THE STATE BOARD OF HEALTH

Hearing scheduled June 16, 2006

Revisions to NAC 459 regulations

Text to be ~~[deleted]~~, text to be ***added***

Authority NRS 459.201

Section 1 ***"Air-purifying respirator" defined. "Air-purifying respirator" means a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.***

Sec. 2 ***"Assigned protection factor" defined. "Assigned protection factor" (APF) means the expected workplace level of respiratory protection that would be provided by a properly functioning respirator or a class of respirators to properly fitted and trained users. Operationally, the inhaled concentration can be estimated by dividing the ambient airborne concentration by the APF.***

Sec. 3 ***"Atmosphere-supplying respirator" defined. "Atmosphere-supplying respirator" means a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.***

Sec. 4 NAC 459.3162 "Constraint ***(dose constraint)"*** defined**.** "Constraint ***(dose constraint)***" ~~[has the meaning ascribed to it in 10 C.F.R. § 20.1003]~~ ***means a value above which specified licensee actions are required***.

Sec. 5 ***"Demand respirator" defined. "Demand respirator" means an atmosphere-supplying respirator that admits breathing air to the facepiece only when a negative pressure is created inside the facepiece by inhalation.***

Sec. 6 ***"Disposable respirator" defined. "Disposable respirator" means a respirator for which maintenance is not intended and that is designed to be discarded after excessive breathing resistance, sorbent exhaustion, physical damage, or end-of-service-life renders it unsuitable for use. Examples of this type of respirator are a disposable half-mask respirator or a disposable escape-only self-contained breathing apparatus (SCBA).***

Sec. 7 ***"Filtering facepiece" defined. "Filtering facepiece" (dust mask) means a negative pressure particulate respirator with a filter as an integral part of the facepiece or with the***

entire facepiece composed of the filtering medium, not equipped with elastomeric sealing surfaces and adjustable straps.

Sec. 8 *"Fit factor" defined. "Fit factor" means a quantitative estimate of the fit of a particular respirator to a specific individual, and typically estimates the ratio of the concentration of a substance in ambient air to its concentration inside the respirator when worn.*

Sec. 9 *"Fit test" defined. "Fit test" means the use of a protocol to qualitatively or quantitatively evaluate the fit of a respirator on an individual.*

Sec. 10 *"Helmet" defined. "Helmet" means a rigid respiratory inlet covering that also provides head protection against impact and penetration.*

Sec. 11 *"Hood" defined. "Hood" means a respiratory inlet covering that completely covers the head and neck and may also cover portions of the shoulders and torso.*

Sec. 12 *"Loose-fitting facepiece" defined. "Loose-fitting facepiece" means a respiratory inlet covering that is designed to form a partial seal with the face.*

Sec. 13 *"Negative pressure respirator" defined. "Negative pressure respirator" (tight fitting) means a respirator in which the air pressure inside the facepiece is negative during inhalation with respect to the ambient air pressure outside the respirator.*

Sec. 14 *"Positive pressure respirator" defined. "Positive pressure respirator" means a respirator in which the pressure inside the respiratory inlet covering exceeds the ambient air pressure outside the respirator.*

Sec. 15 *"Powered air-purifying respirator" defined. "Powered air-purifying respirator" (PAPR) means an air-purifying respirator that uses a blower to force the ambient air through air-purifying elements to the inlet covering.*

Sec. 16 *"Pressure demand respirator" defined. "Pressure demand respirator" means a positive pressure atmosphere-supplying respirator that admits breathing air to the facepiece when the positive pressure is reduced inside the facepiece by inhalation.*

Sec. 17 *"Qualitative fit test" defined. "Qualitative fit test" (QLFT) means a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to the test agent.*

Sec. 18 *"Quantitative fit test" defined. "Quantitative fit test" (QNFT) means an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.*

Sec. 19 *"Self-contained breathing apparatus" defined. "Self-contained breathing apparatus" (SCBA) means an atmosphere-supplying respirator for which the breathing air source is designed to be carried by the user.*

Sec. 20 "Shallow-dose equivalent" defined. "Shallow dose equivalent" ***(Hs)***, means the dose equivalent to the skin ***of the whole body*** or ***the skin of an*** extremity that is measured at a ***tissue*** depth of 0.007 centimeter ***(7 mg/cm2)*** ~~[and averaged over an area of 1 square centimeter]~~.

Sec. 21 ***"Supplied-air respirator" defined. "Supplied-air respirator" (SAR) or airline respirator means an atmosphere-supplying respirator for which the source of breathing air is not designed to be carried by the user.***

Sec. 22 ***"Tight-fitting facepiece" defined. "Tight-fitting facepiece" means a respiratory inlet covering that forms a complete seal with the face.***

Sec. 23 ***"User seal check" defined. "User seal check" (fit check) means an action conducted by the respirator user to determine if the respirator is properly seated to the face. Examples include negative pressure check, positive pressure check, irritant smoke check, or isoamyl acetate check.***

Sec. 24 NAC 459.019 "Appendix A" defined. "Appendix A" means Appendix A to 10 C.F.R. §§ 20.1001 to 20.2402, inclusive, as those provisions existed on J~~[anuary]~~***uly 3***1, ~~[199]~~***200***3

Sec. 25 NAC 459.0145 "Activity" defined**.** "Activity" means the rate of disintegration or decay of radioactive material. The units of activity are the curie and the be***c***querel.

Sec. 26 NAC 459.0212 "Be***c***querel" defined. "Be***c***querel" means a unit of measurement of radioactivity. One be***c***querel is that quantity of radioactive material which decays at the rate of one disintegration per second. One be***c***querel is equivalent to 2.7×10^{-11} curie.

Sec. 27 NAC 459.026 "Curie" defined. "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 kilobe***c***querels.

Sec. 28 NAC 459.054 "Occupational dose" defined. "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:

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]~~***10 CFR Part 35.75***;
4. From voluntary participation in medical research; or
5. As a member of the public.

Sec. 29 NAC 459.065 "Public dose" defined**.** "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:

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]~~ ***10 CFR Part 35.75;***

4. Occupational dose***; or***

~~[4]~~***5***. Voluntary participation in medical research.

Sec. 30 NAC 459.161 Fees; failure to submit fee.

1. An application for the registration of a radiation machine submitted pursuant to NAC 459.154 must be accompanied by a nonrefundable fee for each X-ray tube or electron source which is installed in the radiation machine, as follows:

(a) Medical use, other than mammography, $250.
(b) Veterinary use, $75.
(c) Dental use, $70.
(d) Industrial use, $100.
(e) Academic use, $75.
(f) Accelerator, $275.

2. Except as otherwise provided in subsection 3, if the Division issues a registration certificate pursuant to NAC 459.156, the registrant must, for each year the certificate is valid, submit to the Division a nonrefundable renewal fee in an amount equal to the appropriate fee set forth in subsection 1.

3. The renewal fee must be received by the Division not later than the date on which the registration expires. If the fee is not received by that date, the registrant must:

(a) Stop operating the radiation machine which does not have a valid registration on or before the date the registration expires; or
(b) Submit to the Division within 5 days after the registration expires:
(1) An application for renewal of the registration;
(2) A fee in an amount that is equal to the appropriate fee set forth in subsection 1; and
(3) A fee for late payment of $50 ***per registration***. ~~[During the 12-month period following the renewal of registration, the registrant will be required to pay only one fee for late payment for the facility where the radiation machine is located, regardless of the number of X-ray tubes or electron sources which are installed in the radiation machines located at that facility whose registration is not renewed within the prescribed period]~~.

4. Any application for registration or renewal of registration which is not accompanied by the appropriate fees will not be acted upon by the Division until such fees are paid.

5. An application for a certificate of authorization for a radiation machine must be accompanied by a nonrefundable fee for each machine as required pursuant to NAC 457.295.

Sec. 31 NAC 459.190 Exempt items containing radioactive material other than source material.

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, 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 megabecquerels) of tritium per timepiece.

(2) Five millicuries (185 megabecquerels) of tritium per hand.

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

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

(5) Twenty microcuries (740 kilobecquerels) of promethium 147 per watch hand or 40 microcuries (1.48 megabecquerels) of promethium 147 per other timepiece hand.

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

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

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

(9) Nine-hundredths microcurie (3.33 kilobecquerels) 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 kilobecquerels) of radium 226 per timepiece in timepieces acquired before February 28, 1980.

(b) Lock illuminators containing not more than 15 millicuries (555 megabecquerels) of tritium or not more than 2 millicuries (74 megabecquerels) 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 megabecquerels) of tritium per balance or 0.5 millicurie (18.5 megabecquerels) of tritium per balance part.

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

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

(f) Thermostat dials and pointers containing not more than 25 millicuries (925 megabecquerels) 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 gigabecquerels) of tritium per microwave receiver protector tube or 10 millicuries (370 megabecquerels) of tritium per any other electron tube;

(2) One microcurie (37 kilobecquerels) of cobalt 60;
(3) Five microcuries (185 kilobecquerels) of nickel 63;
(4) Thirty microcuries (1.11 megabecquerels) of krypton 85;
(5) Five microcuries (185 kilobecquerels) of cesium 137;
(6) Thirty microcuries (1.11 megabecquerels) of promethium 147; or
(7) One microcurie (37 kilobecquerels) of radium 226,

Ê 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. 32 NAC 459.192 Exempt self-luminous products containing radioactive material**.**

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, 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, to the extent that he receives, possesses, uses, transfers or owns articles containing less than 0.1 microcurie (3.7 kilobecquerels) 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, 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 kilobe*c*querels) of carbon 14 urea.

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, 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. 33 NAC 459.194 Types of licenses. Licenses for radioactive materials are of two types:

1. General licenses ~~[which]~~ ***are provided by regulation, grants authority to a person for certain activities involving radioactive materials, and*** are effective without the filing of applications with the Division or the issuance of licensing documents to the particular persons, although the filing of a certificate with the Division may be required by the particular general license. The general license is subject to all other applicable portions of these regulations and any limitations of the general license ***unless indicated otherwise in the specific provision of the general license***.

Attention is directed particularly to the provisions of NAC 459.357 of this chapter concerning labeling of containers.

2. ***The Division issues a s***~~[S]~~pecific license~~[s]~~ ***to a named person who has filed*** ~~[which require the submission of]~~ an application ~~[to the Division and the issuance of a licensing document by the Division]~~ ***for the license under the provisions of NAC 459.180 through 459.314***. The license is subject to all applicable portions of these regulations as well as any limitations specified in the licensing document.

Sec. 34 NAC 459.198 Terms and conditions of licenses.

1. Each license issued pursuant to NAC 459.180 to 459.950, inclusive, is subject to all the provisions of chapter 459 of NRS, now or hereafter in effect, and to all regulations and orders of the Division.

2. No license issued or granted under NAC 459.180 to 459.950, inclusive, or right to possess or utilize radioactive material granted by any license issued pursuant to those provisions, may be

transferred, assigned or in any manner disposed of, either voluntarily or involuntarily, directly or indirectly, through transfer of control of any license to any person unless the Division, after securing full information finds that the transfer is in accordance with the provisions of chapter 459 of NRS and gives its consent in writing.

3. Each person licensed by the Division pursuant to NAC 459.180 to 459.950, inclusive, shall:

(a) Confine his use and possession of the material licensed to the locations and purposes authorized in the license.

(b) Inform the Division in writing before the sale or lease of his business if the transaction involves the transfer of a source of radiation to another person.

(c) Inform the Division, in writing, immediately following the filing of a voluntary or involuntary petition for bankruptcy under Title 11 of The United States Code or the appropriate chapter of NRS ***by or against:*** ~~.~~

(i) The licensee;

(ii) An entity (as that term is defined in 11 U.S.C. 101(14)) or the appropriate chapter of NRS controlling the licensee or listing the licensee or licensee as property of the estate; or

(iii) An affiliate (as that term is defined in 11 U.S.C. 101(14)) or the appropriate chapter of NRS of the licensee.

(d) Keep records of information important to the safe and effective decommissioning of the facility where the radioactive material is located in a location identified to the Division until the license is terminated by the Division. If records of information relevant to decommissioning are kept for other purposes, references to these records and their locations may be used. Such information must include:

(1) Records of spills or other unusual occurrences involving the spread of contamination in or around the facility, the equipment of the facility or the site of the facility. These records may be limited to instances when contamination remains after any cleanup procedures or when there is a reasonable likelihood that contaminants may have spread to inaccessible areas including possible seepage into porous materials such as concrete. These records must include any information known to the licensee on the identification of nuclides, quantities, forms and concentrations involved.

(2) Any available drawings of structures and equipment of the facility, as originally built and as modified, which are located in restricted areas where radioactive material are used or stored, and of locations of inaccessible areas to which contaminants may spread such as buried pipes which may be subject to contamination. If drawings are not available, the licensee shall provide to the Division other appropriate records of information concerning these areas.

(3) Records of any performance of an estimate of the costs of decommissioning for incorporation in a plan for financing the decommissioning and any records of the method used for assuring the availability of money for the costs of decommissioning the facility.

4. Each general licensee that is required to register by NAC 459.218.11(a) shall comply with the requirements of NAC 459.198.3(c).

5. Security requirements for portable gauges.

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

Sec. 35 NAC 459.216 General licenses: Measuring, gauging or controlling devices ***and certain devices for producing light or an ionized atmosphere.***

1. A general license is issued to commercial and industrial firms, to research, educational and medical institutions, to a person engaged in the conduct of his own business, and to the state and local governments including the agencies of either, to own, receive, acquire, possess, use or transfer in accordance with the provisions of subsections 2 and 3 and NAC 459.218, radioactive material, excluding special nuclear material, contained in devices designed and manufactured for the purpose of detecting, measuring, gauging or controlling thickness, density, level, interface location, radiation, leakage or qualitative or quantitative chemical composition or for producing light or an ionized atmosphere.

2. The general license in subsection 1 applies only to radioactive material contained in devices which have been manufactured ***or initially transferred*** and labeled in accordance with the specifications contained in a specific license issued by the Division pursuant to NAC 459.282, or in accordance with the specifications contained in a specific license issued by the Nuclear Regulatory Commission or an agreement state ~~[which authorizes distribution of devices to persons generally licensed by the Nuclear Regulatory Commission or an agreement state]~~.

3. ~~[The general license in subsection 1 does not authorize the manufacture of devices containing radioactive material.]~~ ***The devices must have been received from one of the specific licensees described in paragraph 2 or through a transfer made under NAC 459.218.8.***

4. The general license provided in subsection 1 is subject to the provisions of NAC 459.124 to 459.134, inclusive, 459.198, 459.208, 459.312 and 459.314.

Sec. 36 NAC 459.218 General licenses: Other requirements concerning measuring, gauging and controlling devices. Any person who owns, receives, acquires, possesses, uses or transfers radioactive material in a device pursuant to the general license in subsection 1 of NAC 459.216:

1. Shall ensure that all labels affixed to the device at the time of receipt, and bearing a statement that removal of the label is prohibited, are maintained thereon and comply with all instructions and precautions provided by the labels.

2. Shall ensure that the device is tested for leakage of radioactive material and proper operation of the on-and-off mechanism and indicator, if any, and that such tests are conducted at no longer than 6-month intervals or at such other intervals as are specified in the label, except that:

(a) Devices containing only krypton need not be tested for leakage of radioactive material; and

(b) Devices containing only tritium or not more than 100 microcuries of other beta or gamma emitting material, or both, or 10 microcuries of alpha emitting material and devices held in storage in the original shipping container before initial installation need not be tested for any purpose.

3. Shall ensure that the tests required by subsection 2 and other testing, installation, servicing and removal from installation, involving the radioactive materials, its shielding or containment, are performed and recorded:

(a) In accordance with the instructions provided by the labels; or

(b) By a person holding an applicable specific license from the Division, the Nuclear Regulatory Commission or an agreement state to perform such activities.

4. Shall maintain records showing compliance with the requirements of subsections 2 and 3. The records must show the results of tests. The records also must show the dates of performance

of, and the names of persons performing, testing, installing, servicing and removal from installation concerning the radioactive material, its shielding or containment. Records of tests for leakage of radioactive material required by subsection 2 must be maintained until the sealed source is transferred or disposed of. Records of tests of the on-and-off mechanism and indicator required by subsection 2 must be maintained for 1 year after the next required test of the on-and-off mechanism and indicator is performed or until the sealed source is transferred or disposed of. Records which are required by subsection 3 must be maintained for a period of 2 years from the date of the recorded event or until the device is transferred or disposed of.

5. Upon the occurrence of a failure of or damage to, or any indication of a possible failure of or damage to, the shielding of the radioactive material or the on-and-off mechanism or indicator, or upon the detection of ***185 becquerel (***0.005 microcurie***)*** or more of removable radioactive material, shall immediately inform the Radiological Health Section of the Division by telephone, ***immediately*** suspend operation of the device and, within 30 days, furnish to the Division a report containing a brief description of the event ***and the remedial action taken; and, in the case of detection of 0.005 microcurie or more of radioactive material or failure of or damage to a source likely to result in contamination of the premises or the environs, a plan for ensuring that the premises and environs are acceptable for unrestricted use, must be furnished to the Division. The device may not be operated until it has been repaired by the manufacturer or other person holding a specific other person holding a specific license to repair such devices that was issued under 10 CFR Parts 30 and 32 or equivalent Agreement State Regulations. Under these circumstances, the criteria set out in NAC 459.3178, "Property of decommissioned facility: Eligibility for release for unrestricted use", may be applicable as determined by the Division on a case-by-case basis.***

6. Shall not abandon the device containing radioactive material.

7. Except as otherwise provided in subsection 8, may transfer or dispose of the device containing radioactive material only by transfer to a specific licensee of the Division, the Nuclear Regulatory Commission or an agreement state whose specific license authorizes him to receive the device ***or whose license authorizes waste collection***. Within 30 days after transfer of a device to a specific licensee, the person shall furnish to the Division a report containing identification of the device by manufacturer's ***(or initial transferor's)*** name and model number ***and serial number*** and the name ~~[and]~~ **,** address ***and license number of the person receiving the device*** of the person receiving the device, ~~[but no report is required if the device is transferred to the specific licensee in order to obtain a replacement device]~~***and the date of the transfer***. ***The transferor shall obtain Division permission before transferring the device to any other specific licensee not specifically identified in paragraph 7, above.***

8. May transfer the device to another general licensee only:

(a) Where the device remains in use at a particular location. In such a case the transferor shall give the transferee a copy of NAC 459.010 to 459.794, inclusive, and any safety documents identified in the label on the device and within 30 days after the transfer, shall report to the Division the manufacturer's ***(or initial transferor's)*** name ~~[and]~~**,** model number ***and the serial number*** of the device transferred, the name ***title, phone number*** and address of the transferee, and the name and position of a person who may constitute a point of contact between the Division and the transferee ***and has knowledge of and authority to take actions to ensure compliance with the appropriate regulations and requirements***; or

(b) Where the device is held in storage ***by an intermediate person*** in the original shipping container at its intended location of use before initial use by a general licensee.

9. Shall comply with the provisions of NAC 459.369 and 459.3695 for reporting radiation incidents, theft or loss of licensed material, but is exempt from the other requirements of NAC 459.320 to 459.374, inclusive, and 459.780 to 459.794, inclusive.

10. Shall respond to written requests from the Division to provide information relating to the general license within 30 calendar days of the date of the request, or other time specified in the request. If the general licensee cannot provide the requested information within the allotted time, it shall, within that same time period, request a longer period to supply the information by providing the Division, by an appropriate method in NAC 459.134 a written justification for the request.

11. Shall appoint an individual responsible for having knowledge of the appropriate regulations and requirements and the authority for taking required actions to comply with appropriate regulations and requirements. The general licensee, through this individual, shall ensure the day-to-day compliance with appropriate regulations and requirements. This appointment does not relieve the general licensee of any of its responsibility in this regard.

12.(a) Shall register, in accordance with paragraphs 12 (b) and (c) of this section, devices containing at least 370 MBq (10 mCi) of cesium-137, 3.7 MBq (0.1 mCi) of strontium-90, 37 MBq (1 mCi) of cobalt-60, or 37 MBq (1 mCi) of americium-241 or any other transuranic (i.e., element with atomic number greater than uranium (92)), based on the activity indicated on the label. Each address for a location of use, as described under paragraph 12(c)(4) of this section, represents a separate general licensee and requires a separate registration and fee.

(b) If in possession of a device meeting the criteria of paragraph 12(a) of this section, shall register these devices annually with the Division and pay the appropriate fee. Registration must be done by verifying, correcting, and/or adding to the information provided in a request for registration received from the Division. The registration information must be submitted to the Division within 30 days of the date of the request for registration or as otherwise indicated in the request. In addition, a general licensee holding devices meeting the criteria of paragraph 12(a) of this section is subject to the bankruptcy notification requirement in NAC 459.198.3.

(c) In registering devices, the general licensee shall furnish the following information and any other information specifically requested by the Division, including, without limitation:

(1) Name and mailing address of the general licensee.

(2) Information about each device: the manufacturer (or initial transferor), model number, serial number, the radioisotope and activity (as indicated on the label).

(3) Name, title, and telephone number of the responsible person designated as a representative of the general licensee under paragraph 11 of this section.

(4) Address or location at which the device(s) are used and/or stored. For portable devices, the address of the primary place of storage.

(5) Certification by the responsible representative of the general licensee that the information concerning the device(s) has been verified through a physical inventory and checking of label information.

(6) Certification by the responsible representative of the general licensee that they are aware of the requirements of the general license.

(d) Persons generally licensed by the Division, the U.S. Nuclear Regulatory Commission or another Agreement State with respect to devices meeting the criteria in paragraph a of this section are not subject to registration requirements if the devices are used in areas subject to

Division jurisdiction for a period less than 180 days in any calendar year. The Division will not request registration information from such licensees.
13. Shall report changes to the mailing address for the location of use (including change in name of general licensee) to the Division within 30 days of the effective date of the change. For a portable device, a report of address change is only required for a change in the device's primary place of storage.
14. May not hold devices that are not in use for longer than 2 years. If devices with shutters are not being used, the shutter must be locked in the closed position. The testing required by paragraph 2 of this section need not be performed during the period of storage only. However, when devices are put back into service or transferred to another person, and have not been tested within the required test interval, they must be tested for leakage before use or transfer and the shutter tested before use. Devices kept in standby for future use are excluded from the two-year time limit if the general licensee performs quarterly physical inventories of these devices while they are in standby.

Sec. 37 *Same: Conditions of licenses.*
1. If a device containing radioactive material is to be transferred for use under the general license contained in NAC 459.216, each person that is licensed under NAC 459.282 shall provide the information specified in this paragraph to each person to whom a device is to be transferred. This information must be provided before the device may be transferred. In the case of a transfer through an intermediate person, the information must also be provided to the intended user prior to initial transfer to the intermediate person. The required information includes:
(a) A copy of the general license contained in NAC 459.216 of this chapter; if NAC 459.218.2 through NAC 459.218.4 or NAC 459.218 (11)(a) do not apply to the particular device, those paragraphs may be omitted.
(b) A copy of NAC 459.194.1, NAC 459.124, NAC 459.369, and NAC 459.3965;
(c) A list of the services that can only be performed by a specific licensee;
(d) Information on acceptable disposal options including estimated costs of disposal; and
(e) An indication of the Division's policy is to take enforcement actions for improper disposal.
2. If radioactive material is to be transferred in a device for use under an equivalent general license of an Agreement State or the Nuclear Regulatory Commission, each person that is licensed under NAC 459.216 shall provide the information specified in this paragraph to each person to whom a device is to be transferred. This information must be provided before the device may be transferred. In the case of a transfer through an intermediate person, the information must also be provided to the intended user prior to initial transfer to the intermediate person. The required information includes:
(a) A copy of NAC 459.216, NAC 459.194.1, NAC 459.124, NAC 459.369. If a copy of the NRC regulations is provided to a prospective general licensee in lieu of the Agreement State's regulations, it shall be accompanied by a note explaining that use of the device is regulated by the Agreement State; if certain paragraphs of the regulations do not apply to the particular device, those paragraphs may be omitted.
(b) A list of the services that can only be performed by a specific licensee;
(c) Information on acceptable disposal options including estimated costs of disposal; and

(d)The name or title, address, and phone number of the contact at the Agreement State regulatory agency or the Nuclear Regulatory Commission from which additional information may be obtained.
3. An alternative approach to informing customers may be proposed by the licensee for approval by the Commission.
4. Each device that is transferred after February 19, 2005 must meet the labeling requirements in NAC 459.282.
5. If a notification of bankruptcy has been made under NAC 459.198.3 or the license is to be terminated, each person licensed under NAC 459.282 shall provide, upon request, to the NRC and to any appropriate Agreement State, records of final disposition required under Section 38.3.

Sec. 38 *General Licenses: Material transfer reports and records.*
Each person licensed under NAC 459.282 to initially transfer devices to generally licensed persons shall comply with the requirements of this section.
1. The person shall report to the Division by an appropriate method listed in NAC 459.134, all transfers of such devices to persons for use under the general license in NAC 459.282 and all receipts of devices from persons licensed under NAC 459.282. The report must be submitted on a quarterly basis on NRC Form 653, "Transfers of Industrial Devices Report" or in a clear and legible report containing all of the data required by the form.
(a)The required information for transfers to general licensees includes--
(i) The identity of each general licensee by name and mailing address for the location of use; if there is no mailing address for the location of use, an alternate address for the general licensee shall be submitted along with information on the actual location of use.
(ii) The name, title, and phone number of the person identified by the general licensee as having knowledge of and authority to take required actions to ensure compliance with the appropriate regulations and requirements;
(iii) The date of transfer;
(iv) The type, model number, and serial number of the device transferred; and
(v) The quantity and type of radioactive material contained in the device.
(b) If one or more intermediate persons will temporarily possess the device at the intended place of use before its possession by the user, the report must include the same information for both the intended user and each intermediate person, and clearly designate the intermediate person(s).
(c) For devices received from a NAC 459.282 general licensee, the report must include the identity of the general licensee by name and address, the type, model number, and serial number of the device received, the date of receipt, and, in the case of devices not initially transferred by the reporting licensee, the name of the manufacturer or initial transferor.
(d) If the licensee makes changes to a device possessed by a NAC 459.282 general licensee, such that the label must be changed to update required information, the report must identify the general licensee, the device, and the changes to information on the device label.
(e) The report must cover each calendar quarter, must be filed within 30 days of the end of the calendar quarter, and must clearly indicate the period covered by the report.
(f) The report must clearly identify the specific licensee submitting the report and include the license number of the specific licensee.

(g) If no transfers have been made to or from persons generally licensed under NAC 459.282 of this chapter during the reporting period, the report must so indicate.
2. The person shall report all transfers of devices to persons for use under a general license in an Agreement State's or U.S. Nuclear Regulatory Commission's regulations that are equivalent to NAC 459.282 and all receipts of devices from general licensees in the Agreement State's or U.S. Nuclear Regulatory Commission's jurisdiction to the responsible Agreement State agency of U.S. Nuclear Regulatory Commission office. The report must be submitted on NRC Form 653, "Transfers of Industrial Devices Report" or in a clear and legible report containing all of the data required by the form.
(a) The required information for transfers to general licensees includes:
(i) The identity of each general licensee by name and mailing address for the location of use; if there is no mailing address for the location of use, an alternate address for the general licensee shall be submitted along with information on the actual location of use.
(ii) The name, title, and phone number of the person identified by the general licensee as having knowledge of and authority to take required actions to ensure compliance with the appropriate regulations and requirements;
(iii) The date of transfer;
(iv) The type, model number, and serial number of the device transferred; and
(v) The quantity and type of radioactive material contained in the device.
(b) If one or more intermediate persons will temporarily possess the device at the intended place of use before its possession by the user, the report must include the same information for both the intended user and each intermediate person, and clearly designate the intermediate person(s).
(c) For devices received from a general licensee, the report must include the identity of the general licensee by name and address, the type, model number, and serial number of the device received, the date of receipt, and, in the case of devices not initially transferred by the reporting licensee, the name of the manufacturer or initial transferor.
(d) If the licensee makes changes to a device possessed by a general licensee, such that the label must be changed to update required information, the report must identify the general licensee, the device, and the changes to information on the device label.
(e) The report must cover each calendar quarter, must be filed within 30 days of the end of the calendar quarter, and must clearly indicate the period covered by the report.
(f) The report must clearly identify the specific licensee submitting the report and must include the license number of the specific licensee.
(g) If no transfers have been made to or from a particular Agreement State or U.S. Nuclear Regulatory Commission jurisdiction during the reporting period, this information shall be reported to the responsible Agreement State agency or U.S. Nuclear Regulatory Commission office upon request of the agency.
3. The person shall maintain all information concerning transfers and receipts of devices that supports the reports required by this section. Records required by this paragraph must be maintained for a period of 3 years following the date of the recorded event.

Sec. 39 NAC 459.280 Incorporation of naturally occurring or accelerator-produced radioactive material into gas and aerosol detectors. 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:

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 kilobecquerels).

Sec. 40 ***Adoption by reference of certain provisions of Code of Federal Regulations; revision of certain terms.***

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 medical use of radioactive material shall comply with all applicable requirements of, and may rely on all applicable exclusions or exemptions included in, the provisions of Part 35 of Title 10 of the Code of Federal Regulations, as adopted by reference in this section.

2. Part 35 of Title 10 of the Code of Federal Regulations, as those provisions existed on September 16, 2004, 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";

(b) Except 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";

(e) Except as otherwise provided in this section, 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) Except as otherwise provided in this section, 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) Except as otherwise provided in this section, any reference to "10 CFR 20.1101" or "§ 20.1101" shall be deemed a reference to "paragraph (a) of subsection 1 of NAC 459.321";

(h) Except as otherwise provided in this section, any reference to "10 CFR 20.1301(a)(1)" or "§ 20.1301(a)(1)" shall be deemed a reference to "NAC 459.335.1(a)";

(i) Except as otherwise provided in this section, any reference to "10 CFR 20.1301(c)" or "§ 20.1301(c)" shall be deemed a reference to "NAC 459. 335.1(c)";

(j) Except as otherwise provided in this section, any reference to "10 CFR 20.1501" or "§ 20.1501" shall be deemed a reference to "NAC 459.337";

(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) Except as otherwise provided in this section, any reference to "10 CFR part 30" or "10 CFR 30" shall be deemed a reference to "NAC 459.180 – 459.312";

(m) 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;

(n) Except as otherwise provided in this section, any reference to "10 CFR 32.72(b)(4)" or "§32.72(b)(4)" shall be deemed a reference to "NAC 459.300.2(c)";

(o) Except as otherwise provided in this section, any reference to "10 CFR 19.12" or "§ 19.12" shall be deemed a reference to "NAC 459.784";

(p) Except as otherwise provided in this section, any reference to "10 CFR Part 35" or "10 CFR 35" shall be deemed a reference to "this section";

(q) Except as otherwise provided in this section, 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) Except as otherwise provided in this section, any reference to "byproduct material" shall be deemed a reference to "radioactive material" as defined in NAC 459.076;

(s) Except as otherwise provided in this section, any reference to "10 CFR part 170" or "10 CFR 170" shall be deemed a reference to "NAC 459.310";

(t) Except as otherwise provided in this section, any reference to "10 CFR part 171" or "10 CFR 171" shall be deemed a reference to "NAC 459.310";

(u) Except as otherwise provided in this section, any reference to "10 CFR 33.13" or "§ 33.13" shall be deemed a reference to "NAC 459.268";

(v) Except as otherwise provided in this section, any reference to "10 CFR 30.34(b)" or "§ 30.34(b)" shall be deemed a reference to "NAC 459.198";

(w) Except as otherwise provided in this section, any reference to "10 CFR 30.6" or "§ 30.6" shall be deemed a reference to "NAC 459.134";

(x) Except as otherwise provided in this section, any reference to "10 CFR part 33" or "10 CFR 33" shall be deemed a reference to "NAC 459.262 – 459.274";

(y) Except as otherwise provided in this section, any reference to NRC Form 313 shall be deemed a reference to Nevada's NRC Form NRC-5;

(z) Except as otherwise provided in this section, any reference to NRC Operations Center shall be deemed a reference to NAC 459.134 and the contact information described in the State of Nevada Radiological Emergency Response Plan.

(aa) Except as otherwise provided in this section, any reference to Director, Office of Nuclear Safety and Safeguards shall be deemed a reference to NAC 459.134 and the contact information described in the State of Nevada Radiological Emergency Response Plan.

(bb) Except as otherwise provided in this 10 CFR 35.10, the implementation date described in 10 CFR 35.10(a) and (d) shall be the effective date of these regulations.

(cc) Prior to October 28, 2008, a licensee shall satisfy the training requirements of this part for a Radiation Safety Officer, an authorized medical physicist, an authorized nuclear pharmacist, or an authorized user by complying with either:

(1) The appropriate training requirements in 10 CFR 35 subpart J; or

(2) The appropriate training requirements in 10 CFR 35 subpart B or subparts D through H.

(dd) On or after October 28, 2008, a licensee shall satisfy the training requirements of 10 CFR 35 subpart B or subparts D through H.

3. The following sections of Part 35 of Title 10 of the Code of Federal Regulations, as those provisions existed on September 16, 2004, are not adopted by reference:

(a) Section 35.8;

(b) Section 35.4001;

(c) Section 35.4002.

4. A copy of a publication that contains Part 35 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 $75.

Sec. 41 NAC 459.282 Manufacture and distribution of devices. An application for a specific license to manufacture or distribute devices containing radioactive material, excluding special nuclear material, to persons generally licensed under NAC 459.216 or equivalent regulations of the Nuclear Regulatory Commission or an agreement state will be approved if:

1. The applicant satisfies the general requirements of NAC 459.238;

2. The applicant submits sufficient information relating to the design, manufacture, prototype testing, quality control, labels, proposed uses, installation, servicing, leak testing, operating and safety instructions and potential hazards of the device to provide reasonable assurance that:

(a) The device can be safely operated by persons not having training in radiological protection;

(b) Under ordinary conditions of handling, storage and use of the device, the radioactive material contained in the device will not be released or inadvertently removed from the device, and it is unlikely that any person will receive in any period of 1 year a dose in excess of 10 percent of the limits specified in NAC 459.325;

(c) In an accident such as fire or explosion, associated with handling, storage and use of the device, it is unlikely that any person would receive an external radiation dose or dose commitment in excess of the following organ doses:

(1) Whole body, head and trunk, active blood-forming organs, gonads or lens of eye…….... 15 rems

(2) Hands and forearms, feet and ankles, localized areas of skin averaged over areas no larger than 1 square centimeter..... 200 rems

(3) Ohter organs..... 50 rems

3. Each device bears a durable, legible, clearly visible label or labels approved by the Division which contain in a clearly identified and separate statement:

(a) Instructions and precautions necessary to assure safe installation, operation and maintenance of the device. Documents such as operating and service manuals may be identified in the label and used to provide this information;

(b) The requirement, or lack of requirement, for leak testing, or for testing any on-and-off mechanism and indicator, including the maximum time interval for such testing, and the identification of radioactive material by isotope, quantity of radioactivity and date of determination of the quantity; and

(c) The information called for in the following statement, in the same or substantially similar form:

> The receipt, possession, use and transfer of this device model, serial number, are subject to a general license or the equivalent and the regulations of the Nuclear Regulatory Commission of a state with which the Nuclear Regulatory Commission has entered into an agreement for the exercises of regulatory authority. This label must be maintained on the device in a legible condition. Removal of this label is prohibited.

CAUTION - RADIOACTIVE MATERIAL

.....
(Name of manufacturer or distributor)

(d) The model, serial number and name of manufacturer or distributor may be omitted from the label required by this subsection if the information is specified elsewhere and labeling is affixed to the device.

4. Each device having a separable source housing that provides the primary shielding for the source also bears, on the source housing, a durable label containing the device model number and serial number, the isotope and quantity, the words, "Caution-Radioactive Material," the radiation symbol, and the name of the manufacturer or initial distributor.

5. Each device meeting the criteria of NAC 459.218.11(a), bears a permanent (e.g., embossed, etched, stamped, or engraved) label affixed to the source housing if separable, or the device if the source housing is not separable, that includes the words, "Caution-Radioactive Material," and, if practicable, the radiation symbol described in NAC 459.355.

Sec. 42 NAC 459.306 Manufacture and distribution of sources and devices for medical use. An application for a specific license to manufacture and distribute sources and devices containing radioactive material to persons licensed pursuant to ~~[NAC 459.240, 459.242, or 459.258]~~***10 CFR Part 35, or equivalent Agreement State regulations, for use as a calibration or reference source or for the uses listed in 10 CFR Part 35.400, 35.500 or 35.600, or equivalent Agreement State regulations,*** will be approved if:

1. The applicant satisfies the general requirements in NAC 459.238;

2. The applicant submits sufficient information regarding each type of source or device pertinent to an evaluation of its radiation safety, including:

(a) The radioactive material contained, its chemical and physical form, and amount;

(b) Details of design and construction of the source or device;

(c) Procedures for, and results of, prototype tests to demonstrate that the source or device will maintain its integrity under stresses likely to be encountered in normal use and in accidents;

(d) For devices containing radioactive material, the radiation profile of a prototype device;

(e) Details of quality control procedures to ensure that production sources and devices meet the standards of the design and prototype tests;

(f) Procedures and standards for calibrating sources and devices;

(g) Legends and methods for labeling sources and devices as to their radioactive content; and

(h) Instructions for handling and storing the source or device from the radiation safety standpoint; these instructions are to be included on a durable label attached to the source or device or attached to a permanent storage container for the source or device; provided, that instructions which are too lengthy for the label may be summarized on the label and printed in detail on a brochure which is referenced on the label; and

3. The label affixed to the source, device, or permanent storage container for the source or device contains information on the radionuclide, quantity, date of assay, and a statement that the ~~[source or device is licensed by the Division for distribution]~~***Division has approved distribution of the (name of source or device)*** to persons licensed ~~[pursuant to NAC 459.240, 459.242, or 459.258]~~ ***to use radioactive material identified in 10 CFR Part 35.57, 35.400, 35.500 and 35.600, as appropriate,*** ~~[or under]~~ ***and to persons who hold an*** equivalent license~~[s]~~ ~~[of the]~~

issued by Nuclear Regulatory Commission or an agreement state ~~[provided that labeling for the sources which do not require long-term storage, for example, gold-198 seeds, may be on a leaflet or brochure which accompanies the source]~~.

Sec. 43 NAC 459.325 Limits on occupational doses for adults.

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 (500 millisieverts);

(b) A lens dose equivalent of 15 rems (150 millisieverts); and

(c) A shallow-dose equivalent to the skin ***of the whole body*** or ~~[to]~~ ***the skin of*** 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 ***assigned*** deep-dose equivalent ~~[and shallow-dose equivalent]~~must be for the portion of the body receiving the highest exposure. ***The assigned shallow-dose equivalent must be the dose averaged over the contiguous 10 square centimeters of skin receiving the highest exposure.*** The deep-dose equivalent, 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. 44 NAC 459.335 Dose limits for individual members of public; application for authorization to increase limits; imposition of additional restrictions.

1. Except as otherwise provided in this section and subsection 2 of NAC 459.321, each licensee and registrant shall conduct operations ~~[to ensure]~~ ***so*** 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]~~***10 CFR Part 35.75***,

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~~]~~***10 CFR Part 35.75***, does not exceed 0.002 rem (0.02 millisievert) ~~[~~per~~]~~***in any one*** hour.

(c) Notwithstanding paragraph 1(a) of this section, a licensee may permit visitors to an individual who cannot be released, under 10 CFR 35.75, to receive a radiation dose greater than 0.1 rem (1 millisievert) if:

(1) The radiation dose received does not exceed 0.5 rem (5 millisievert); and

(2) The authorized user has determined before the visit that it is appropriate.

2. A licensee, a registrant or an applicant for a license or registration may apply to the Division for authorization to ~~[~~increase the ~~]~~***operate up to an annual dose*** limit ~~[~~set forth in paragraph (a) of subsection 1 to ~~]~~***for an individual member of the public of*** 0.5 rem (5 millisieverts) per year. The application must include:

(a) ~~[~~A statement ~~]~~***Demonstration*** 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~~]~~***The licensee's or registrant's*** program of the licensee or registrant to assess and control the dose within the annual limit of 0.5 rem ***(5 millisieverts)***; and

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

3. ***In addition to the requirements of this part, a licensee subject to the provisions of EPA's generally applicable environmental radiation standards in 40 CFR Part 190 shall comply with those standards.***

~~[~~3~~]~~***4***. The Division may impose additional restrictions on radiation levels in unrestricted areas and on the total quantity of radionuclides that ***a licensee*** may ~~[~~be ~~]~~release~~[~~d~~]~~ in effluents in order to restrict the collective dose.

Sec. 45 NAC 459.236 Specific licenses: Filing of application.

1. Applications for specific licenses must be filed on a form prescribed by the Division and accompanied by the appropriate fee as prescribed in NAC 459.310.

2. The Division may at any time after the filing of the original application, and before the expiration of the license, require further statements in order to enable the Division to determine whether the application should be granted or denied or whether a license should be modified or revoked.

3. Each application must be signed by the applicant or licensee or a person duly authorized to act for and on his behalf.

4. An application for a license may include a request for a license authorizing one or more activities.

5. In his application, the applicant may incorporate by reference information contained in previous applications, statements or reports filed with the Division provided such references are clear and specific.

6. Applications and documents submitted to the Division may be made available for public inspection except that the Division may withhold any document or part thereof from public inspection if disclosure of its content is not required in the public interest and would adversely affect the interest of a person concerned.

7. An application for a specific license to use radioactive material in the form of a sealed source or in a device that contains the sealed source must either-
(a) Identify the source or device by manufacturer and model number as registered with the Commission under Section 46, 10 CFR Part 32.210 or with an Agreement State under equivalent regulations; or
(b) Contain the information identified in Section 46.3, 10 CFR Part 32.210(c) or equivalent regulations of an Agreement State.
8. As provided by NAC 459.1955, certain applications for specific licenses filed must contain a proposed decommissioning funding plan or a certification of financial assurance for decommissioning.

Sec. 46 *Registration of product information.*
1. Any manufacturer or initial distributor of a sealed source or device containing a sealed source whose product is intended for use under a specific license may submit a request to NRC or an Agreement State for evaluation of radiation safety information about its product and for its registration.
2. The request for review must be sent to the NRC's Office of Nuclear Material Safety and Safeguards, Materials Safety and Inspection Branch, by an appropriate method listed in 10 CFR Part 30.6(a) or equivalent contact information for an Agreement State.
3. The request for review of a sealed source or a device must include sufficient information about the design, manufacture, prototype testing, quality control program, labeling, proposed uses and leak testing and, for a device, the request must also include sufficient information about installation, service and maintenance, operating and safety instructions, and its potential hazards, to provide reasonable assurance that the radiation safety properties of the source or device are adequate to protect health and minimize danger to life and property.
4. The NRC or Agreement State normally evaluates a sealed source or a device using radiation safety criteria in accepted industry standards. If these standards and criteria do not readily apply to a particular case, the NRC formulates reasonable standards and criteria with the help of the manufacturer or distributor. The NRC or Agreement State shall use criteria and standards sufficient to ensure that the radiation safety properties of the device or sealed source are adequate to protect health and minimize danger to life and property.
5. After completion of the evaluation, the Commission or Agreement State issues a certificate of registration to the person making the request. The certificate of registration acknowledges the availability of the submitted information for inclusion in an application for a specific license proposing use of the product.
6. The person submitting the request for evaluation and registration of safety information about the product shall manufacture and distribute the product in accordance with--
(a) The statements and representations, including quality control program, contained in the request; and
(b) The provisions of the registration certificate.

Sec. 47 NAC 459.307 Testing sealed sources for leakage.

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, the U.S. Nuclear Regulatory Commission or an Agreement State in***

the Sealed Source and Device Registry. 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 sources contain only radioactive material with a half-life of less than 30 days;***

(b) The sources contain only radioactive material as a gas;

(~~[a]~~***c***) 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]~~***d***) The sealed source is stored and is not being used. 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.

(e) The source(s) are seeds of iridium-192 encased in nylon ribbon.

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 ***and must include the:***

(a) Model number and serial number if one has been assigned of each sealed source tested;

(b) The identity of each source by radionuclide and its estimated activity;

(c) The results of the test;

(d) The date of the test; and

(e) The name of the individual who performed the test.

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 ***written*** report must be filed with the Division within 5 days of the test describing the equipment involved, ***the model and serial number if assigned, of the leaking source; the radionuclide and its estimated activity; the*** test results***,*** ~~[and the location of the source]~~ ***the date of the test and the action taken***.

Sec. 48 NAC 459.347 Precautionary procedures: Use of process or other engineering controls; alternative controls.

1. A licensee shall use, to the extent practicable, process or other engineering controls***, including, without limitation, containment, decontamination or ventilation,*** to control the concentrations of radioactive material in the air.

2. If it is not practicable to apply process or other engineering controls to control the concentrations of radioactive material in the air to levels below those that define an area of airborne radioactivity, the licensee shall, consistent with maintaining the total effective dose equivalent as low as is reasonably achievable, increase monitoring and limit intakes by ***one or more of the following means***:

(a) Controlling access to the area;

(b) Limiting exposure times;

(c) Using respiratory protective ~~[devices]~~***equipment;*** or

(d) Using any other means available to control concentrations of radioactive material in the air.

3. If the licensee performs an ALARA analysis to determine whether or not respirators should be used, the licensee may consider safety factors other than radiological factors. The licensee should also consider the impact of respirator use on worker's industrial health and safety.

Sec. 49 NAC 459.349 Precautionary procedures: Use of individual respiratory protective devices.

1. If a licensee uses respiratory protective devices to limit intakes as required pursuant to NAC 459.347, he shall comply with the following requirements:

(a) Except as otherwise provided in paragraph (b), the licensee shall use only a respiratory protective device that is tested and certified, or has had certification extended, by the National Institute for Occupational Safety and Health~~[and the Mine Safety and Health Administration]~~.

(b) If the licensee wishes to use equipment that has not been tested or certified by the National Institute for Occupational Safety and Health~~[and the Mine Safety and Health Administration, has not had certification extended by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration,]~~ or for which there is no schedule for testing or certification, the licensee shall submit an application for authoriz~~[ation]~~***ed*** ~~[to]~~ use ***of*** that equipment ***except as provided in this paragraph***. The application must include evidence that the material and performance characteristics of the equipment are capable of providing the proposed degree of protection under anticipated conditions of use. ~~[The evidence must be acquired from testing the equipment or based on information obtained from other reliable tests that have been performed on the equipment.]~~ ***This must be demonstrated either by licensee testing or on the basis of reliable test information.***

(c) The licensee shall ~~[carry out]~~ ***implement and maintain*** a program for respiratory protection that includes, without limitation:

(1) A sampling of the air that is sufficient to identify any potential hazard, permit the proper selection of equipment and estimate ~~[exposures]~~***doses***;

(2) Surveys and bioassays, as ~~[appropriate]~~***necessary***, to evaluate actual intakes;

(3) Testing respirator***s***~~[y protective devices]~~ for operability ***(user seal check for face sealing devices and functional check for others)*** immediately before each use;

(4) Written procedures regarding~~[the selection, fitting, issuance, maintenance and testing of respiratory protective devices, including, without limitation, procedures for]~~:

(I) ***Fit t***~~[T]~~esting ~~[for operability immediately before each use]~~;

(II) The supervision and training of ~~[personnel]~~***respiratory users***;

(III) Recordkeeping;~~[and]~~

(IV) ***Monitoring, including, without limitation, sampling air and bioassays;***~~[and]~~

(V) Respirator selection;

(VI) Breathing air quality;

(VII) Inventory and control;

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

IX Limitations on periods of respirator use and relief from respirator use.

5) The determination by a physician that each user is medically fit to use the respiratory protective***:*** ~~[device before the initial fitting of each respiratory protective device and:~~

~~(I) At least once every 12 months after the initial fitting; or~~

~~(II) Periodically at a frequency that is determined by the physician.]~~

(I) Before the initial fitting of a face sealing respirator;

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

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

(d) ~~[The licensee shall issue a written statement of policy regarding the use of respiratory protective devices that includes:~~

~~(1) The use of process or other engineering controls instead of respiratory protective devices;~~

~~(2) The routine, nonroutine and emergency use of respiratory protective devices; and~~

~~(3) The length of use of respiratory protective devices and relief from such use.]~~***Fit testing, with fit factor ≥ 10 times the APF for negative pressure devices, and a fit factor > 500 for any positive pressure, continuous flow, and pressure-demand devices, before the first field use of tight fitting, face-sealing respirators and periodically thereafter at a frequency not to exceed 1 year. Fit testing must be performed with the facepiece operating in the negative pressure mode.***

(e) The licensee shall advise each user of a respirator~~[y protective device]~~ that the user may leave the area at any time ***for relief from respirator use*** if:

(1) The device malfunctions;

(2) He suffers physical or psychological distress;

(3) There is a failure of communication or ~~[a failure to comply with]~~procedur***es***~~[al requirements]~~;

(4) There is a significant deterioration in the operating conditions; or

(5) There are any other conditions that might require relief from use of the device.

(f) ~~[The licensee shall use respiratory protective devices within the manufacturer's expressed limitations for type and mode of use and shall provide proper visual, communication and other special capabilities when needed.]~~***The licensee shall also consider limitations appropriate to the type and mode of use. When selecting respiratory devices the licensee shall provide for vision correction, adequate communication, low temperature work environments, and the concurrent use of other safety or radiological protection equipment. The licensee shall use equipment in such a way as not to interfere with the proper operation of the respirator.***

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

(h) Atmosphere-supplying respirators must be supplied with desirable air of grade D quality or better as defined by the Compressed Gas Association in publication G-7.1, "Commodity Specification for Air," 1997 and included in the regulations of the Occupational Safety and

Health Administration (29 CFR 1910.134(i)(1)(ii)(A) through (E). Grade D quality air criteria include:
(1) Oxygen content (v/v) of 19.5-23.5%;
(2) Hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less;
(3) Carbon monoxide (CO) content of 10 ppm or less;
(4) Carbon dioxide content of 1,000 ppm or less; and
(5) Lack of noticeable odor.
(i) The licensee shall ensure that no objects, materials or substances, such as facial hair, or any conditions that interfere with the face-facepiece seal or valve function, and that are under the control of the respirator wearer, are present between the skin of the wearer's face and the sealing surface of a tight-fitting respirator facepiece.
(j) In estimating the dose to individuals from intake of airborne radioactive materials, the concentration of radioactive material in the air that is inhaled when respirators are worn is initially assumed to be the ambient concentration in air without respiratory protection, divided by the assigned protection factor. If the dose is later found to be greater than the estimated dose, the corrected value must be used. If the dose is later found to be less than the estimated dose, the corrected value may be used.

2. ~~[When estimating the exposure of persons to airborne radioactive materials, the licensee may make allowance for respiratory protective devices used to limit intakes pursuant to NAC 459.347, if the following conditions, in addition to those specified in subsection 1, are satisfied:~~

~~(a) The licensee selects a respiratory protective device that provides a protection factor, as specified in Appendix A, which is greater than the multiple by which peak concentrations of airborne radioactive materials in the working area are expected to exceed the values specified in Column 3 of Table I of Appendix B. If the selection of a respiratory protective device with a protection factor greater than the multiple is inconsistent with the requirement specified in NAC 459.347 for keeping the total effective dose equivalent as low as is reasonably achievable, the licensee may select a respiratory protective device with a lower protection factor only if such a selection would result in a total effective dose equivalent that is as low as is reasonably achievable. The concentration of radioactive material in the air that is inhaled when the respiratory protective device is worn may be initially estimated by dividing the average concentration in the air, during each period of uninterrupted use, by the protection factor. If the exposure is later found to be greater than initially estimated, the corrected value must be used. If the exposure is later found to be less than initially estimated, the corrected value may be used.~~

~~(b)]~~ A licensee shall obtain authorization from the Division before ***using*** assign~~[ing]~~ ***ed*** respiratory protection factors in excess of those specified in Appendix A ***of 10 CFR Part 20***. The Division may authorize a licensee to use higher ***assigned*** protection factors upon receipt of an application that:

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

(b) Demonstrates that the respiratory protective ~~[device]~~***equipment*** provides these higher protection factors under the proposed conditions of use.

~~[3. In an emergency, the licensee shall use as emergency equipment only respiratory protective devices that have been specifically certified, or had certification extended, for emergency use by the National Institute for Occupational Safety and Health and the Mine Safety and Health Administration.~~

~~4. The licensee shall notify the Division in writing at least 30 days before the date that a respiratory protective device is first used pursuant to subsection 1 or 2.]~~

3. The Division may impose restrictions in addition the provisions of this NAC 459.347 and 459.349 in order to:
(a) Ensure that the respiratory protection program of the licensee is adequate to limit doses to individuals from intakes of airborne radioactive materials consistent with maintaining total effective dose equivalent ALARA; and
(b) Limit the extent to which a license may use respiratory protection equipment instead of process or other engineering controls.

Sec. 50 NAC 459.320 Purpose; applicability; reasonable effort required.

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, 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]~~***10 CFR Part 35.75***, or voluntary participation in medical research does not exceed the standards of radiation protection set forth in 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. 51 NAC 459.3565 Precautionary procedures: Exceptions to requirements for posting signs.

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. 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 gigabe***c***querels), or the measured dose rate at 1 meter from the patient is less than 0.005 rem (0.05 millisievert) per hour;

(b) The licensee is authorized to release the patient from confinement pursuant to ~~[NAC 459.256]~~ ***10 CFR Part 35.75***; 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. 52 NAC 459.300 Manufacture, preparation or transfer for commercial distribution of radiopharmaceuticals for medical use.

1. An application for a specific license to manufacture, prepare or transfer for commercial distribution radiopharmaceuticals containing radioactive material for use by persons licensed for medical use pursuant to NAC 459.240, 459.242 or 459.258, or by persons authorized under a license issued by the Nuclear Regulatory Commission or any other agreement state will be approved if:

(a) The applicant satisfies the general requirements specified in NAC 459.238;

(b) The applicant submits evidence that the applicant is:

(1) Registered or licensed as a drug manufacturer by:

(I) The United States Food and Drug Administration; or

(II) An agency of this State;

(2) Licensed as a pharmacy by the State Board of Pharmacy; or

(3) Operating as a nuclear pharmacy within a medical facility;

(c) The applicant submits information on the radionuclide, chemical and physical form, maximum activity per vial, syringe, generator or other container of the radiopharmaceutical and shielding provided by the packaging of the radioactive material to demonstrate that it is appropriate for safe handling and storage of radiopharmaceuticals by licensees authorized to use radioactive material for medical use; and

(d) The applicant complies with the following labeling requirements:

(1) A label must be affixed to each transport radiation shield of the radiopharmaceutical, including, without limitation, shields made of lead, glass or plastic, to be transferred for commercial distribution. The label must set forth or contain the radiation symbol, the words "CAUTION, RADIOACTIVE MATERIAL" or "DANGER, RADIOACTIVE MATERIAL," the name of the radioactive drug, or its abbreviation, and the quantity of radioactivity at the time and date specified on the label. For pharmaceuticals with a half-life of more than 100 days, the time may be omitted from the label.

(2) A label must be affixed to each syringe, vial or other container used to hold a radiopharmaceutical to be transferred for commercial distribution. The label must set forth the radiation symbol, the words "CAUTION, RADIOACTIVE MATERIAL" or "DANGER,

RADIOACTIVE MATERIAL" and an identifier that ensures that the syringe, vial or other container can be correlated with the information on the transport radiation shield label.

2. A licensee who is licensed as a pharmacy by the State Board of Pharmacy or who is operating as a nuclear pharmacy within a medical facility:

(a) May prepare radio~~[pharmaceuticals]~~***active drugs*** for medical use***, as defined in NAC 459.0508,*** if the radio~~[pharmaceuticals]~~***active drug*** is prepared by ***either***:

(1) An authorized nuclear ***pharmacist, as specified in (b) and (c)***; or

(2) A person under the supervision of an authorized nuclear pharmacist pursuant to NAC 459.3817.

(b) May allow a pharmacist to work as an authorized nuclear pharmacist if the pharmacist:

(1) Is an authorized nuclear pharmacist; or

(2) Has received the training set forth in paragraph (b) of subsection 1 of NAC 459.3961 within the 7 years immediately preceding the date he begins work as an authorized nuclear pharmacist and the licensee has received an amendment to his license identifying the pharmacist as an authorized nuclear pharmacist.

(c) May designate a pharmacist as an authorized nuclear pharmacist if the pharmacist is identified***, as of December 2, 1994,*** as an authorized user on a license for a nuclear pharmacy issued by the Division, the Nuclear Regulatory Commission ***under 10 CFR Part 32*** or an agreement state.

(d) Shall provide to the Division:

(1) A copy of the certification, license or permit for each pharmacist that authorizes the pharmacist to perform any of the activities set forth in this subsection within 30 days after performing such activities; and

(2) A copy of the license or registration of the pharmacy or nuclear pharmacy within 30 days after the pharmacist performs any of the activities set forth in this subsection.

3. A licensee who prepares radiopharmaceuticals for medical use pursuant to this section shall:

(a) Possess and use an instrument to measure the radioactivity of alpha- , beta- or photon-emitting radiopharmaceuticals;

(b) Have procedures for the use of the instrument;

(c) Measure, by direct measurement or by a combination of measurements and calculations, the amount of radioactivity in dosages of alpha-, beta- or photon-emitting radiopharmaceuticals before transfer for commercial distribution;

(d) Perform tests before initial use, periodically and following repair on each instrument for accuracy, linearity and geometry dependence, as appropriate for the instrument, and make adjustments to the instrument if necessary; and

(e) Check each instrument for constancy and proper operation at the beginning of each day of use.

4. Nothing in this section relieves the licensee from complying with applicable FDA, other Federal, and State requirements governing radioactive drugs.

Sec. 53 NAC 459.1955 Requirements of applicants: Submission of decommissioning plan and financial assurance.

1. A plan for financing decommissioning, as described in subsection ~~[8]~~***10***, 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 ***(unity rule)*****.**

2. ***Each holder of, or applicant for, any specific license authorizing the possession and use of sealed sources or plated foils of half-life greater than 120 days and in quantities exceeding 1012 times the applicable quantities set forth in NAC 459.362 (or when a combination of isotopes is involved if R, as defined in NAC 459.1955.1(b), divided by 1012 is greater than 1), shall submit a plan for financing decommissioning as described in Section 10. The plan for financing decommissioning must be submitted to Division by December 2, 2006.***

~~[2]~~***3***. 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]~~***9*** shall submit:

(a) A plan for financing decommissioning as described in subsection ~~[8]~~***10***; or

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

(1) Has been provided in the amount required by subsection ~~[7]~~***9*** using one of the methods set forth in subsection ~~[9]~~***11***; 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]~~***4***. 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]~~***3***, 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]~~***11*** 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]~~***11***.

~~[4]~~***5***. An applicant for a specific license of the type described in subsection 1 or ~~[2]~~***3*** shall submit a plan for financing decommissioning or a certification of financial assurance for decommissioning with his application.

~~[5]~~***6***. 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]~~***1,125,000***. 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]~~***3***, shall submit~~[, on or before September 30, 1998,]~~a plan for financing decommissioning or a certification of financial assurance for decommissioning.

~~[6]~~***7***. 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 ***3***~~[2 before September 30, 1998]~~. ***The decommissioning funding plan must be submitted by December 2, 2006.***

~~[7]~~***8. Waste collectors and waste processors, as defined in 10 CFR part 20, Appendix G, must provide financial assurance in an amount based on a decommissioning funding plan as described in paragraph 9 of this section. The decommissioning funding plan must include the***

cost of disposal of the maximum amount (curies) of radioactive material permitted by license, and the cost of disposal of the maximum quantity, by volume, of radioactive material which could be present at the licensee's facility at any time, in addition to the cost to remediate the licensee's site to meet the license termination criteria of NAC 459.200. The decommissioning funding plan must be submitted by December 2, 2006.

~~[7]~~***9***. Financial assurance for decommissioning must be provided in accordance with the following amounts:

(a) Not less than $~~[750,000]~~***1,125,000*** 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***, as defined in NAC 459.362,*** divided by 10^5 is less than or equal to 1.

(b) Not less than $~~[150,000]~~***225,000*** 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***, as defined in NAC 459.362,*** divided by 10^4 is less than or equal to 1.

(c) Not less than $~~[75,000]~~***113,000*** 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, ***as defined in NAC 459.362,*** for a combination of radionuclides, divided by 10^{10} is greater than 1.

~~[8]~~***10***. 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]~~***11***;

(c) A schedule for adjusting the estimate of costs ***(which must be adjusted at intervals not to exceed 3 years)*** 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]~~***11***.

~~[9]~~***11***. 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]~~***14***. 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]~~***14***. 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.

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]~~ ***9*** and an indication that money for decommissioning will be obtained when necessary.

~~[10]~~ ***12***. 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.

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]~~ ***13***. 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 its license is terminated.

~~[12]~~***14***. To pass the financial test referred to in subsection ~~[9]~~***11***:

(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]~~***9***; 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]~~***9***; 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]~~***9***; 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]~~***15***. 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 cancelled 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]~~***14*** 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]~~***16***. A licensee who guarantees the costs of decommissioning 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]~~***17***. 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]~~***14*** and ~~[14]~~***16***. 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]~~***18***. 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]~~***14***.

~~[17]~~***19***. 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]~~***20***. 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. 54 NAC 459.310 Fees for licenses. Except as otherwise provided in NAC 459.203, the Division will not issue a new specific license or a renewed specific license to a person until the appropriate nonrefundable fee has been paid to the Division, as prescribed in the following table:

Material and use	Fee
1. Special nuclear material:	
(a) As sealed source	..... $2,000
(b) In unsealed form	 2,000
2. Source materials for other than milling operations	..... $2,000
3. By-product material***,*** ~~[and]~~radium ***and artificially produced radioactive material***:	

(a) Manufacturing or distribution, or both	$2,000
(b) Nuclear pharmacy	6,000
(c) Industrial radiography	5,000
(d) Category 1 irradiator	1,500
(e) Academic, broad scope	8,000
(f) Academic, other research and development	1,200
(g) Service or laboratory	1,600
(h) Fixed gauge	1,000
(i) Gas chromatograph	450
(j) In vitro	95
(k) Portable gauge or X-ray fluorescence analyzer	1,200
(l) All other uses of source material, special nuclear material, by-product material and radium except those set forth in subsections 4 to 7, inclusive	1,000
4. Well logging	$3,000
5. Medical use or veterinary use of radioactive material:	
(a) Medical use or veterinary use only	$4,000
(b) With teletherapy	4,000
(c) With high dose remote afterloader	4,000
(d) With brachytheraphy	~~[3]~~*4*,000
(e) Teletherapy only	4,000
(f) High dose remote afterloader only	4,000
(g) Brachytheraphy only	~~[3]~~*4*,000
(h) General license for in vitro use	115
6. Civil defense	$250
7. ***Registration of a device(s) generally licensed under NAC 459.218.12(a).***	***$250***
~~[7]~~*8*. Any use of source material, special nuclear material, by-product material or radium by a person who holds a license issued by the Nuclear Regulatory Commission or any agreement state	See appropriate fee category above

Sec. 55 NAC 459.554 Administrative controls: Radiographic exposure.

1. Except for patients who cannot be moved out of the room, only the staff and ancillary personnel required for the medical procedure or training may be in the room during the radiographic exposure. Other than the patient being examined:

(a) All persons must be positioned so that no part of the body which is not protected by 0.5 mm lead equivalent will be struck by the useful beam.

(b) Staff and ancillary personnel must be protected from the direct scatter radiation by protective aprons or whole body protective barriers of not less than 0.25 mm lead equivalent.

(c) A patient who cannot be removed from the room must be protected from the direct scatter radiation by a whole body protective barrier of 0.25 mm lead equivalent or be so positioned that the nearest portion of the body is at least 2 meters from both the tube head and the nearest edge of the image receptor.

(d) When a portion of the body of any member of the staff or ancillary personnel is potentially subjected to stray radiation which could result in his receiving ~~[one quarter]~~ ***ten percent*** of the maximum permissible dose, as defined in NAC 459.320 to 459.374, inclusive, additional protective devices must be employed.

Sec. 56 NAC 459.3235 Quality factors for converting absorbed dose.

1. Except as otherwise provided in subsection 2, the quality factors for converting an absorbed dose to a dose equivalent are as follows:

Quality Factors and Absorbed Dose Equivalencies

Type of Radiation	Quality Factor	Absorbed Dose Equal to a Unit Dose Equivalent
X-, gamma, or beta radiation and high-speed electrons	1	1
Alpha particles, multiple-charged particles, fission fragments and heavy particles of unknown charge	20	.05
Neutrons of unknown energy	10	0.1
High-energy protons	10	0.1

2. If it is more convenient to measure the neutron fluence rate than to determine the neutron dose equivalent rate in rems per hour, as provided in subsection 1, 1 rem of neutron radiation of unknown energies may, for the purposes of NAC 459.010 to 459.950, inclusive, be assumed to result from a total fluence of 25,000,000 neutrons per square centimeter incident upon the body. If sufficient information exists to estimate the approximate energy distribution of the neutrons, the licensee or registrant may use the fluence rate per unit dose equivalent or the appropriate quality factor value from the following table to convert a measured tissue dose in rads to dose equivalent in rem:

Mean Quality Factors and Fluence per Unit Dose Equivalent for Monoenergetic Neutrons

	Neutron Energy (MeV)	Quality Factor	Fluence per Unit Dose Equivalent (neutrons ***c***m^{-2} rem^{-1})
(thermal)	2.5E-8	2	980E+6
	1E-7	2	980E+6
	1E-6	2	810E+6
	1E-5	2	810E+6
	1E-4	2	840E+6
	1E-3	2	980E+6

Neutron Energy	Quality Factor	Fluence per Unit Dose Equivalent
1E-2	2.5	1010E+6
1E-1	7.5	170E+6
5E-1	11	39E+6
1	11	27E+6
2.5	9	29E+6
5	8	23E+6
7	7	24E+6
10	6.5	24E+6
14	7.5	17E+6
20	8	16E+6
40	7	14E+6
60	5.5	16E+6
1E+2	4	20E+6
2E+2	3.5	19E+6
3E+2	3.5	16E+6
4E+2	3.5	14E+6

3. For the purposes of subsection 2, the quality factor must be measured at the point where the dose equivalent is maximum in a 30-centimeter diameter cylinder tissue-equivalent phantom.

Sec. 57 NAC 459.0508 "Medical use of radioactive material" and "medical use" defined. **(**NRS 459.201**)** "Medical use of radioactive material" or "medical use" means the intentional internal or external administration of:

1. Licensed radioactive material or radiation therefrom ***as described in 10 CFR Part 35***; or

2. Radiation from a machine that produces radiation, to patients or human research subjects under the supervision of an authorized user.

Sec. 58 NAC 459.202 Renewal of licenses. Applications for renewal of specific licenses must be filed in accordance with ***NAC 459.200,*** NAC 459.236 and, except as otherwise provided in NAC 459.203, must be accompanied by the appropriate fee as set forth in NAC 459.310. The application for renewal must be received by the Division not later than the date on which the license expires. If the application is not received by that date, the licensee must:

1. Stop all operations involving radioactive materials and place all sources of radiation in storage until they can be transferred to persons authorized to receive them; or

2. Submit to the Division within 5 days after the license expires an application for renewal of the license accompanied by a fee that is equal to twice the amount of the appropriate fee set forth in NAC 459.310.

Sec. 59 ***(insert after 459.3615) Transfer for disposal and manifests.***
1 The requirements of this section and appendix G to 10 CFR Part 20 are designed to-
(a) Control transfers of low-level radioactive waste by any waste generator, waste collector, or waste processor licensee, as defined in this part, who ships low-level waste either directly, or

indirectly through a waste collector or waste processor, to a licensed low-level waste land disposal facility (as defined in 10 CFR Part 61);
(b) Establish a manifest tracking system; and
(c) Supplement existing requirements concerning transfers and recordkeeping for those wastes.
2. Any licensee shipping radioactive waste intended for ultimate disposal at a licensed land disposal facility must document the information required on NRC's Uniform Low-Level Radioactive Waste Manifest and transfer this recorded manifest information to the intended consignee in accordance with appendix G to 10 CFR Part 20.
3. Each shipment manifest must include a certification by the waste generator as specified in section II of appendix G to 10 CFR Part 20.
4. Each person involved in the transfer for disposal and disposal of waste, including the waste generator, waste collector, waste processor, and disposal facility operator, shall comply with the requirements specified in section III of appendix G to 10 CFR Part 20.

Sec. 60 The following text is hereby repealed:

NAC 459.0207 "Authorized nuclear pharmacist" defined. (NRS 459.201**)** "Authorized nuclear pharmacist" means a person who meets the requirements set forth in subsection 1 of NAC 459.3961.

NAC 459.0208 "Authorized user" defined. (NRS 459.201**)** "Authorized user" means a person who meets the requirements set forth in NAC 459.3944 to 459.3966, inclusive, as applicable.

NAC 459.0218 "Brachytherapy source" defined. (NRS 459.201**)** "Brachytherapy source" means an individual sealed source or a manufacturer-assembled source train that is not designed to be disassembled by the user.

NAC 459.0272 "Dedicated check source" defined. (NRS 459.201**)** "Dedicated check source" means a radioactive source that is used to assure the constant operation of a radiation detection or measurement device over several months or years.

NAC 459.0514 "Misadministration" defined. (NRS 459.201**)** "Misadministration" means the administration of:

1. A dosage greater than 30 microcuries of sodium iodide containing iodine-125 or iodine-131, if:

(a) The administration is:

(1) To a natural person other than the natural person intended by the prescribing physician; or

(2) Of a radiopharmaceutical other than that intended by the prescribing physician; or

(b) The administered dosage differs from the prescribed dosage by more than 20 percent, and the difference between the administered dosage and the prescribed dosage is more than 30 microcuries;

2. A therapeutic dosage of a radiopharmaceutical other than sodium iodide containing iodine-131, if:

(a) The administration is:

(1) To a natural person other than the natural person intended by the prescribing physician;

(2) Of a radiopharmaceutical other than that intended by the prescribing physician; or

(3) By a route of administration other than that intended by the prescribing physician; or

(b) The administered dosage differs from the prescribed dosage by more than 20 percent of the prescribed dosage;

3. A dose of gamma radiation during stereotactic radiosurgery, if:

(a) The administration is:

(1) To a natural person other than the natural person intended by the prescribing physician; or

(2) At a site other than the site of treatment intended by the prescribing physician; or

(b) The calculated total administered dose differs from the total prescribed dose by more than 10 percent of the total prescribed dose;

4. A dose of radiation during teletherapy, if:

(a) The administration is:

(1) To a natural person other than the natural person intended by the prescribing physician;

(2) By a mode of treatment other than that intended by the prescribing physician; or

(3) At a site other than the site of treatment intended by the prescribing physician;

(b) The treatment consists of three or fewer fractions and the calculated total administered dose differs from the total prescribed dose by more than 10 percent of the total prescribed dose;

(c) The calculated weekly administered dose exceeds the weekly prescribed dose by 30 percent or more of the weekly prescribed dose; or

(d) The calculated total administered dose differs from the total prescribed dose by more than 20 percent of the total prescribed dose;

5. A dose of radiation during brachytherapy, if:

(a) The administration is:

(1) To a natural person other than the natural person intended by the prescribing physician;

(2) Of a radioisotope other than that intended by the prescribing physician;

(3) At a site other than the site of treatment intended by the prescribing physician, except for permanent implants where seeds planted in the intended site migrate outside that site;

(4) Of a sealed source that leaks; or

(5) Of a temporary implant and one or more sealed sources are not removed upon completion of the procedure; or

(b) The calculated administered dose differs from the prescribed dose by more than 20 percent of the prescribed dose; or

6. A diagnostic dosage of a radiopharmaceutical, other than a quantity that exceeds 30 microcuries of sodium iodide containing iodine-125 or iodine-131, if the effective dose equivalent to the natural person exceeds 5 rems, or the dose equivalent to any organ exceeds 50 rems, and:

(a) The administration is:

(1) To a natural person other than the natural person intended by the prescribing physician;

(2) Of a radiopharmaceutical other than that intended by the prescribing physician; or

(3) By a route of administration other than that intended by the prescribing physician; or

(b) The administered dosage differs from the prescribed dosage.

NAC 459.062 "Pharmacist" defined. (NRS 459.201**)** "Pharmacist" means a person who holds a certificate of registration pursuant to chapter 639 of NRS.

NAC 459.064 "Physician" defined. (NRS 459.201**)** "Physician" has the meaning ascribed to it in NRS 630.014.

NAC 459.0648 "Prescribed dosage" defined. (NRS 459.201**)** "Prescribed dosage" means the quantity of radiopharmaceutical activity set forth in:

1. A written directive for the administration of the radiopharmaceutical;

2. A written description of the diagnostic clinical procedure pursuant to which the radiopharmaceutical is administered, if the description:

(a) Is contained in a manual of descriptions, instructions and precautions for the performance of diagnostic clinical procedures by licensees;

(b) Has been approved by the prescribing physician; and

(c) Contains the radiopharmaceutical, dosage and route of administration prescribed; or

3. Any other appropriate documentation of the diagnostic procedure pursuant to which the radiopharmaceutical is administered, which is prepared in accordance with the directions of the prescribing physician.

NAC 459.0649 "Prescribed dose" defined. (NRS 459.201**)** "Prescribed dose" means, for the administration of:

1. Gamma radiation during stereotactic radiosurgery, the total dose set forth in the written directive for the administration.

2. Radiation during teletherapy, the total dose and dose per fraction set forth in the written directive for the administration.

3. Radiation during brachytherapy:

(a) The total source strength and time of exposure; or

(b) The total dose, set forth in the written directive for the administration.

NAC 459.074 "Radiation safety officer" defined. "Radiation safety officer" means a person who***:*** ~~**[**has the knowledge and responsibility to apply appropriate regulations for protection against radiation**]**~~

1. Meets the requirement of NAC 459.394 and 459.3966; or

2. Is identified as a radiation safety officer on:

a. A specific medical user license issued by the United States Nuclear Regulatory Commission or an Agreement State; or

b. A medical use permit issued by a United States Nuclear Regulatory Commission master material license.

NAC 459.0786 "Recordable event" defined. (NRS 459.201**)** "Recordable event" means the administration of:

1. A dosage of a radiopharmaceutical or a dose of radiation, for which a written directive is required, without:

(a) A written directive for the administration; or

(b) A daily entry of the administered dosage or dose in the appropriate record;

2. A dosage greater than 30 microcuries of sodium iodide containing iodine-125 or iodine-131, if:

(a) The administered dosage differs from the prescribed dosage by more than 10 percent of the prescribed dosage; and

(b) The difference between the administered dosage and the prescribed dosage is more than 15 microcuries;

3. A therapeutic dosage of a radiopharmaceutical other than sodium iodide containing iodine-131, if the administered dosage differs from the prescribed dosage by more than 10 percent of the prescribed dosage;

4. A dose of radiation during teletherapy, if the calculated weekly administered dose exceeds the weekly prescribed dose by 15 percent or more of the weekly prescribed dose; or

5. A dose of radiation during brachytherapy, if the calculated administered dose differs from the prescribed dose by more than 10 percent of the prescribed dose.

NAC 459.105 "Teletherapy physicist" defined. "Teletherapy physicist" means the person identified as the teletherapy physicist on a license.

NAC 459.1165 "Written directive" defined. "Written directive" means a written order for the administration of a radiopharmaceutical or radiation to a specific patient or human research subject that:

1. Is dated and signed by an authorized user before the administration and:

(a) For the administration of a quantity greater than 30 microcuries of sodium iodide containing iodine-125 or iodine-131, contains the dosage prescribed.

(b) For the therapeutic administration of a radiopharmaceutical other than sodium iodide containing iodine-131, contains the radiopharmaceutical, dosage and route of administration prescribed.

(c) For the administration of gamma radiation during stereotactic radiosurgery, contains the target coordinates, collimator size, plug pattern and total dose prescribed.

(d) For the administration of radiation during teletherapy, contains the total dose, dose per fraction, site of treatment and overall period of treatment prescribed.

(e) For the administration of radiation during brachytherapy by remote afterloading at a high dose rate, contains the radioisotope, site of treatment and total dose prescribed.

2. For the administration of radiation during any brachytherapy other than that described in paragraph (e) of subsection 1, contains:

(a) Before implantation, the radioisotope, number of sources and source strengths prescribed.

(b) After implantation and before completion of the procedure, the radioisotope and site of treatment prescribed, and:

(1) The total source strength and time of exposure prescribed; or

(2) The total dose prescribed.

NAC 459.2432 Specific licenses: License required for medical use of radioactive material.

1. Except as otherwise provided in subsections 2 and 3, a person shall not manufacture, produce, acquire, receive, possess, use or transfer radioactive material for medical use unless that person is licensed to perform such activities by:

(a) The Division;

(b) The Nuclear Regulatory Commission; or

(c) An agreement state.

2. A person may receive, possess, use or transfer radioactive material for medical use under the supervision of an authorized user as set forth in NAC 459.3816.
3. A person may prepare unsealed radioactive material for medical use under the supervision of:
(a) An authorized user as set forth in NAC 459.3816; or
(b) An authorized nuclear pharmacist as set forth in NAC 459.3817.

NAC 459.2436 Specific licenses: Application for, amendment to or renewal of license for medical use of radioactive material within medical facility. An application for a license, amendment to a license or renewal of a license for medical use of radioactive material within a medical facility must be made by the management of the medical facility.

NAC 459.2445 Specific licenses: Restrictions on medical uses of radioactive material. A licensee may use for medical use of radioactive material only:

1. Teletherapy sources manufactured and distributed in accordance with a license issued:

(a) Pursuant to 10 C.F.R. Part 30, as those provisions existed on January 26, 1999; or

(b) By an agreement state.

2. Sealed sources or devices manufactured, labeled, packaged and distributed in accordance with a license issued:

(a) Pursuant to 10 C.F.R. Part 30 and 10 C.F.R. § 32.74, as those provisions existed on January 26, 1999; or

(b) By an agreement state.

NAC 459.2447 Specific licenses: Use of instrument to measure radioactivity of alpha- or beta-emitting radionuclides.

1. Except as otherwise provided in subsection 2, a licensee shall:

(a) Possess and use an instrument to measure the radioactivity of alpha- or beta-emitting radionuclides;

(b) Have procedures for the use of the instrument described in paragraph (a);

(c) Measure, by direct measurement or by a combination of measurements and calculations, the amount of radioactivity in dosages of alpha- or beta-emitting radionuclides before administration to each patient or human research subject;

(d) Perform tests before initial use, periodically and following repair, on each instrument described in paragraph (a) that the licensee possesses for accuracy, linearity and geometry dependence, as appropriate for each instrument, and make adjustments to each instrument if necessary; and

(e) Check each instrument described in paragraph (a) that the licensee possesses for constancy and proper operation at the beginning of each day of use.

2. The provisions of subsection 1 do not apply to unit dosages of alpha- or beta-emitting radionuclides that are obtained from a manufacturer or preparer licensed:

(a) Pursuant to 10 C.F.R. § 32.72, as those provisions existed on January 26, 1999; or

(b) By an agreement state.

NAC 459.245 Specific licenses: Conditions of and limitations upon medical uses of radioactive material; checks and tests of dose calibrators.

1. A licensee who is authorized for any medical use of radioactive material shall use for medical purposes only:

(a) Sealed sources or devices manufactured, labeled, packaged and distributed in accordance with a license issued by the Nuclear Regulatory Commission pursuant to 10 C.F.R. Part 30 and 10 C.F.R. § 32.74, as those provisions existed on January 26, 1999, or the equivalent regulations of an agreement state.

(b) Teletherapy sources manufactured and distributed in accordance with a license issued by the Nuclear Regulatory Commission pursuant to 10 C.F.R. Part 30, as those provisions existed on January 26, 1999, or the equivalent regulations of an agreement state.

2. A licensee authorized to use and administer radiopharmaceuticals shall have in his possession a dose calibrator and use it to measure:

(a) The amount of activity of the photon-emitting radionuclide in each radiopharmaceutical dosage immediately before administration to a patient or human research subject.

(b) By direct measurement or by a combination of measurements and calculations, the activity of each dosage of an alpha- or a beta-emitting radionuclide before medical use of radioactive material, except for unit dosages obtained from a manufacturer or preparer licensed pursuant to 10 C.F.R. § 32.72, as those provisions existed on January 26, 1999, or the equivalent requirements of an agreement state.

3. A licensee shall retain a record of the measurements required by this section for at least 3 years. The record must contain the:

(a) Generic name, trade name or abbreviation of the radiopharmaceutical;

(b) Lot number, expiration date and name of the radionuclide;

(c) Name and, if applicable, the identification number of the patient or human research subject;

(d) Prescribed dosage and activity of the dosage at the time of measurement or a notation that the total activity is less than 30 microcuries;

(e) Date and time of the measurement; and

(f) Initials of the person who made the record.

4. A licensee shall:

(a) Check each dose calibrator for constancy with a dedicated check source at the beginning of each day of use. To satisfy the requirement of this paragraph, the check must be done on a frequently used setting with a sealed source of not less than 10 microcuries of radium-226 or 50 microcuries of any photon-emitting radionuclide.

(b) Test each dose calibrator for accuracy upon installation and at least annually thereafter by assaying at least two sealed sources containing different radionuclides whose activity the manufacturer has determined to be within 5 percent of its stated activity, whose activity is at least 10 microcuries for radium-226 and 50 microcuries for any other photon-emitting radionuclide, and at least one of which has a principle photon energy between 100 keV and 500 keV.

(c) Test each dose calibrator for linearity upon installation and at least quarterly thereafter over the range of its use between the highest dosage that will be administered to a patient or human research subject and 10 microcuries.

(d) Test each dose calibrator for geometry dependence upon installation over the range of volumes and volume configurations for which it will be used. The licensee shall keep a record of this test for the duration of the use of the dose calibrator.

5. A licensee shall also perform appropriate checks and tests required by this section following adjustment or repair of the dose calibrator.

6. A licensee shall mathematically correct the dosage reading for any geometry or linearity error that exceeds 10 percent if the dosage is greater than 10 microcuries and shall repair or replace the dose calibrator if the accuracy or constancy error exceeds 10 percent.

7. Except as otherwise provided in paragraph (d) of subsection 4, a licensee shall retain a record of each check and test required by this section for at least 3 years unless directed otherwise by the Division. The records of the checks and tests required by subsection 4 must include:

(a) For paragraph (a) of subsection 4, the model and serial number of the dose calibrator, the identity of the radionuclide contained in the check source, the date of the check, the activity measured and the initials of the person who performed the check;

(b) For paragraph (b) of subsection 4, the model and serial number of the dose calibrator, the model and serial number of each source used, the identity of the radionuclide contained in the source and its activity, the date of the test, the results of the test and the initials of the person who performed the check;

(c) For paragraph (c) of subsection 4, the model and serial number of the dose calibrator, the calculated activities, the measured activities, the date of the test and the initials of the person who performed the check; and

(d) For paragraph (d) of subsection 4, the model and serial number of the dose calibrator, the configuration of the source measured, the activity measured for each volume measured, the date of the test and the initials of the person who performed the check.

NAC 459.247 Specific licenses: Unsealed radioactive material prepared for medical use for uptake, dilution or excretion studies. (NRS 459.201**)**

1. A licensee may use for uptake, dilution or excretion studies any unsealed radioactive material prepared for medical use that is:

(a) Obtained from a manufacturer or preparer licensed pursuant to 10 C.F.R. § 32.72, as those provisions existed on January 26, 1999, or the equivalent requirements of an agreement state; or

(b) Prepared by:

(1) An authorized nuclear pharmacist;

(2) An authorized user who meets the requirements set forth in NAC 459.3946; or

(3) A person supervised by the authorized nuclear pharmacist or authorized user.

2. A licensee authorized to use radioactive material for uptake, dilution and excretion studies shall have in his possession a portable radiation detection survey instrument capable of detecting dose rates ranging from 0.1 millirem per hour to 100 millirem per hour.

NAC 459.2481 Specific licenses: Unsealed radioactive material prepared for medical use for imaging and localization studies. (NRS 459.201**)**

1. A licensee may use for imaging and localization studies any unsealed radioactive material prepared for medical use that is:

(a) Obtained from a manufacturer or preparer licensed pursuant to 10 C.F.R. § 32.72, as those provisions existed on January 26, 1999, or the equivalent requirements of an agreement state; or

(b) Prepared by:

(1) An authorized nuclear pharmacist;

(2) An authorized user who meets the requirements set forth in NAC 459.3946; or

(3) A person supervised by the authorized nuclear pharmacist or physician.

2. A licensee shall not administer to humans a radiopharmaceutical containing more than 0.15 microcurie of molybdenum-99 per millicurie of technetium-99m.

3. A licensee who uses molybdenum-99/technetium-99m generators for preparing a technetium-99m radiopharmaceutical shall measure the molybdenum-99 concentration in each eluate or extract.

4. A licensee who is required to measure molybdenum concentration pursuant to subsection 3 shall retain a record of each measurement for at least 3 years. The record must include, for each elution or extraction of technetium-99m:

(a) The measured activity of the technetium expressed in millicuries;

(b) The measured activity of the molybdenum expressed in microcuries;

(c) The ratio of the measures expressed as microcuries of the molybdenum per millicurie of the technetium;

(d) The time and date of the measurement; and

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

5. A licensee who is authorized to use radioactive material for imaging and localization studies shall have in his possession a portable radiation detection survey instrument capable of detecting dose rates ranging from 0.1 millirem per hour to 100 millirem per hour and a portable radiation measurement survey instrument capable of measuring dose rates ranging from 1 millirem per hour to 1,000 millirem per hour.

NAC 459.249 Specific licenses: Medical use of check, calibration and reference sources. (NRS 459.201**)**

1. A licensee who is authorized for medical use of radioactive material may receive, possess, and use as check, calibration or reference sources:

(a) Any sealed source containing radioactive material, except radium and transuranic isotopes, which is manufactured and distributed by a person licensed by the Nuclear Regulatory Commission pursuant to § 32.74 of 10 C.F.R. Part 32, or equivalent agreement state regulations, if the activity of the source does not exceed 15 millicuries. A sealed source containing radium-226 may be used if its activity does not exceed 20 microcuries.

(b) Any radioactive material listed in NAC 459.247 or 459.2481, which has a half-life of less than 100 days, in individual amounts not to exceed 15 millicuries.

(c) Any radioactive material listed in NAC 459.247 or 459.2481, which has a half-life of longer than 100 days, in individual amounts not to exceed 200 microcuries.

(d) Technetium-99m, in individual amounts not to exceed 50 millicuries.

2. A licensee who possesses and uses a source or device containing radioactive material shall:

(a) Have each source or device tested for leakage of radioactive material in accordance with NAC 459.307.

(b) Follow the instructions on radiation safety and handling which are approved by the Division, the Nuclear Regulatory Commission or an agreement state and furnished by the manufacturer on the label attached to the source, device or permanent container or in the leaflet or brochure which accompanies the source or device and maintain such instruction in a legible and conveniently available form.

(c) Conduct a quarterly physical inventory of all sources and devices received and possessed and keep records of the inventory for inspection by the Division. The records must include:

(1) The quantities and kinds of radioactive material;

(2) The location of sources and devices; and
(3) The date of the inventory.

NAC 459.250 Specific licenses: In vitro uses. (NRS 459.201**)** Any licensee who is licensed pursuant to NAC 459.240, 459.242, or 459.258 is also authorized to use radioactive material under the general license in NAC 459.228 for the specified in vitro uses without filing division form NRC-8 as required by NAC 459.230. The licensee is subject to the other provisions of NAC 459.228.

NAC 459.253 Specific licenses: Use of sources for topical, interstitial or intracavitary medical treatment. (NRS 459.201**)**

1. A licensee shall use the following sources in accordance with the manufacturer's radiation safety and handling instructions:

(a) Cesium-137, as a sealed source in needles and applicator cells for topical, interstitial, and intracavitary treatment of cancer.

(b) Cobalt-60, as a sealed source in needles and applicator cells for topical, interstitial, and intracavitary treatment of cancer.

(c) Gold-198, as a sealed source in seeds for interstitial treatment of cancer.

(d) Strontium-90, as a sealed source in an applicator for treatment of superficial eye conditions.

(e) Iodine-125, as a sealed source in seeds for interstitial treatment of cancer.

(f) Radon-222, as a sealed source in seeds for interstitial and intracavitary treatment of cancer.

(g) Radium-226, as a sealed source for topical, interstitial, and intracavitary treatment of cancer.

(h) Iridium-192, as seeds encased in nylon ribbon for interstitial treatment of cancer.

(i) Palladium-103, as a sealed source in seeds for interstitial treatment of cancer.

2. A licensee who is authorized to use radioactive material for implant therapy shall have in his possession a portable radiation detection survey instrument capable of detecting dose rates ranging from 0.1 millirem per hour to 100 millirem per hour and a portable radiation measurement survey instrument capable of measuring dose rates ranging from 1 millirem per hour to 1,000 millirem per hour.

3. A licensee shall ensure that needles or standard medical applicator cells containing radium-226 or cobalt-60 as wire are not opened while in the licensee's possession unless the licensee is specifically authorized to open them under a license issued to him by the Division.

NAC 459.255 Specific licenses: Use of radiopharmaceuticals for therapy. (NRS 459.201**)**

1. A licensee may use any unsealed radioactive material prepared for medical use that is:

(a) Obtained from a manufacturer or preparer licensed pursuant to 10 C.F.R. § 32.72, as those provisions existed on January 26, 1999, or the equivalent requirements of an agreement state; or

(b) Prepared by:

(1) An authorized nuclear pharmacist;

(2) An authorized user who meets the requirements of NAC 459.3946; or

(3) A person supervised by the authorized nuclear pharmacist or physician.

2. A licensee who is authorized to use radioactive material for radiopharmaceutical therapy shall have in his possession a portable radiation detection survey instrument capable of detecting dose rates ranging from 0.1 millirem per hour to 100 millirem per hour and a portable radiation

measurement survey instrument capable of measuring dose rates ranging from 1 millirem per hour to 1,000 millirem per hour.

NAC 459.256 Specific licenses: Release of natural person given radiopharmaceutical or radioactive implants; calculation of total effective dose equivalent; provision of information to limit exposure of other persons to radiation emitted from natural person; conduct of radiation surveys; records.

1. A licensee may authorize the release from its control of a natural person who has been administered a radiopharmaceutical, 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,

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.

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.

6. A licensee shall not release from its control a natural person treated by temporary implant until all sources have been removed.

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.

8. Using the survey data required pursuant to subsection 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.

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.

NAC 459.2571 Specific licenses: Written directives required for certain administrations; exceptions.

1. A written directive is required for each:

(a) Administration of a dose of radiation during teletherapy;

(b) Administration of a dose of gamma radiation during stereotactic radiosurgery;

(c) Administration of a dose of radiation during brachytherapy;

(d) Administration of a quantity greater than 30 microcuries of sodium iodide containing iodine-125 or iodine-131; or

(e) Therapeutic administration of a radiopharmaceutical other than sodium iodide containing iodine-131.

2. If a written directive is required for an administration, the prescribing physician shall, before the administration occurs:

(a) Prepare, date and sign a written directive for the administration, unless:

(1) Because of the emergent nature of the condition of the patient or human research subject, the delay required to prepare the written directive would place the health of the patient or human research subject in jeopardy;

(2) An oral directive for the administration is made and immediately written in the record of the patient or human research subject; and

(3) The prescribing physician prepares, dates and signs a written directive for the administration within 24 hours after the oral directive is made; or

(b) Date and sign a written revision to an existing written directive for a diagnostic or therapeutic procedure, unless:

(1) Because of the condition of the patient or human research subject, the delay required to prepare the written revision would place the health of the patient or human research subject in jeopardy;

(2) An oral revision of the existing written directive is made and immediately written in the record of the patient or human research subject; and

(3) The prescribing physician signs a revised written directive within 48 hours after the oral revision is made.

NAC 459.2572 Specific licenses: Written program of policies and procedures required; modification of written program; submission of written program with application for license.

1. The holder of a specific license for a medical use of radioactive material shall establish and carry out a written program to ensure that radioactive material and radiation from radioactive material is administered as directed by the prescribing physician. The program must include written policies and procedures to ensure that:

(a) The prescribing physician complies with the provisions of NAC 459.2571.

(b) Before each administration occurs, the identity of the patient or human research subject is verified, by two or more methods, as the person named in the written directive for the administration.

(c) The final plan of treatment and related calculations for any brachytherapy, teletherapy or stereotactic radiosurgery by gamma radiation are in accordance with the written directive for the administration.

(d) Each administration is made in accordance with the written directive for the administration.

(e) Any unintended deviation from a written directive is identified and evaluated, and appropriate action taken.

2. The licensee may modify the program established pursuant to subsection 1 to increase the efficiency of the program if:

(a) The modification will not result in a decrease in the efficiency of the program; and

(b) He provides the Division with a copy of the modification within 30 days after the modification is made.

3. An applicant for a specific license for a medical use of radioactive material shall submit to the Division, as part of his application for such a license, a written program that complies with the requirements of subsection 1.

NAC 459.2573 Specific licenses: Mandatory review and evaluation of written program. (NRS 459.201**)** A licensee shall:

1. Develop a procedure for and, at intervals not to exceed every 12 months, conduct a review of the program he establishes pursuant to NAC 459.2572. Each review must include an evaluation of:

(a) A representative sample of administrations to patients or human research subjects;

(b) All recordable events; and

(c) All misadministrations,

in which he was involved since the most recent review, to verify compliance with all aspects of the program.

2. Evaluate each review to determine the effectiveness of the program and, if necessary, modify the program so that it complies with the requirements of NAC 459.2572.

NAC 459.2574 Specific licenses: Duties upon discovery of recordable event. (NRS 459.201**)** A licensee involved in a recordable event shall, within 30 days after he discovers the recordable event, evaluate and respond to the recordable event by identifying:

1. All relevant facts, including the cause of the recordable event; and
2. Any corrective action necessary to prevent a recurrence.

NAC 459.2575 Specific licenses: Notifications and reports of medical misadministrations; medical care for natural person. (NRS 459.201**)**

1. A licensee involved in a misadministration shall:

(a) No later than the next calendar day after he discovers the misadministration, notify the Division of the misadministration by telephone.

(b) No later than 24 hours after he discovers the misadministration, notify the referring physician of the misadministration.

(c) No later than 24 hours after he discovers the misadministration, notify the natural person who received the misadministration, or a relative or guardian responsible for the natural person, of the misadministration, except that:

(1) He is not required to provide that notification without first consulting with the referring physician or if the referring physician personally informs him that:

(I) The referring physician will provide the notification; or

(II) Based upon the medical judgment of the referring physician, such a notification would be harmful.

(2) He is not required to provide that notification within 24 hours if:

(I) The referring physician, natural person who received the misadministration, relative or guardian cannot be reached within that time; and

(II) He provides that notification as soon as possible thereafter.

(d) Within 15 days after he discovers the misadministration, submit to the Division a written report of the misadministration. The report must state:

(1) The name of the licensee;

(2) The name of the prescribing physician;

(3) A brief description of the misadministration;

(4) The reason the misadministration occurred;

(5) The effect of the misadministration on the natural person who received it;

(6) Any corrective action taken to prevent a recurrence; and

(7) Whether the licensee notified the natural person who received the misadministration, or a relative or guardian responsible for the natural person, of the misadministration and:

(I) If not, the reason for not doing so; or

(II) If so, the information provided to the natural person, relative or guardian.

The report must not include the name of the natural person who received the misadministration or any other information that could lead to the identification of that natural person.

(e) Within 15 days after he discovers the misadministration, submit to a natural person, relative or guardian who received notification of the misadministration pursuant to paragraph (c), a written report of the misadministration. The report must consist of:

(1) A copy of the report submitted to the Division pursuant to paragraph (d); or

(2) A brief description of the misadministration and the possible effects on the natural person who received it, and a statement that the report submitted to the Division pursuant to paragraph (d) may be obtained from the licensee.

2. A licensee shall not delay any appropriate medical care for a natural person, including, without limitation, any remedial care required as a result of a misadministration, because of any delay required to carry out this section.

3. Except for the specific requirements of this section regarding notification, nothing in this section affects the respective rights and duties of any licensee or physician with regard to each other, a natural person, or any relative or guardian responsible for a natural person.

NAC 459.2576 Specific licenses: Records of written directives, administrations and misadministrations. A licensee shall:

1. Retain a copy of each written directive with which he is involved for at least 3 years following the date of administration.

2. Prepare a record of each administration of a dosage of a radiopharmaceutical or dose of radiation:

(a) In which he is involved; and

(b) For which a written directive is required,

and retain the record for at least 3 years following the date of administration in a form that can be audited.

3. Prepare a record of each review the licensee conducts pursuant to NAC 459.2573 which includes, without limitation, the evaluation and findings of each review, and retain the record for at least 3 years in a form that can be audited.

4. Prepare a record of the relevant facts regarding, and any corrective action taken to prevent the recurrence of, a recordable event in which the licensee is involved, and retain the record for at least 3 years in a form that can be audited.

5. Prepare, and retain for at least 5 years, a record of each misadministration in which the licensee is involved. The record must contain:

(a) The name of each person involved in the misadministration, including, without limitation, the natural person who received the misadministration, the referring physician, the prescribing physician and any allied health personnel;

(b) The social security number or other number identifying the natural person who received the misadministration, if one has been assigned; and

(c) A brief description of:

(1) The misadministration;

(2) The reason the misadministration occurred;

(3) The effect of the misadministration on the natural person who received it;

(4) Any corrective action necessary to prevent a recurrence; and

(5) Any corrective action taken to prevent a recurrence.

NAC 459.258 Specific licenses: Human use of sealed sources. (NRS 459.201**)** In addition to the requirements in NAC 459.238, a specific license for human use of sealed sources will be issued only if the applicant or, if the application is made by an institution, the individual user is a physician who:

1. Has specialized training in diagnostic or therapeutic use of the sealed source considered; or

2. Has experience equivalent to such training.

NAC 459.269 NAC 459.269 Broad licenses: Exemptions regarding type A specific license of broad scope. (NRS 459.201**)** A licensee with a type A specific license of broad scope for medical use is exempt from the provisions of:

1. Paragraphs (a) and (b) of subsection 4 of NAC 459.381; and
2. Subsections 1 and 2 of NAC 459.3815.

NAC 459.3807 Provisions for research involving human subjects. (NRS 459.201)

1. A licensee may conduct research with human subjects that involves radioactive material if the licensee complies with subsection 2 and:

(a) The research is conducted, funded, supported or regulated by an agency which has implemented the provisions of 21 C.F.R. Part 50, as those provisions existed on January 26, 1999; or

(b) The licensee has received an amendment to his license from the Division that authorizes such research.

2. A licensee shall obtain:

(a) Informed consent from each human subject; and

(b) Approval of the research by an institutional review board, before the research may be conducted.

3. As used in this section, "institutional review board" has the meaning ascribed to it in 21 C.F.R. § 50.3, as those provisions existed on January 26, 1999.

NAC 459.381 Conditions that require amendment to license. (NRS 459.201**)** A licensee possessing a license authorizing the use of radioactive materials in medical procedures must apply for and receive an amendment to his license before he:

1. Receives or uses any radioactive material for a clinical procedure not specifically permitted by the license.
2. Changes radiation safety officers or teletherapy physicists.
3. Orders radioactive material:

(a) In excess of the amount authorized by the license;

(b) In a form different than authorized by the license; or

(c) Not authorized by the license.

4. Adds to or changes:

(a) Any address of use;

(b) Any area of use; or

(c) Any restricted area.

NAC 459.3815 Notification of certain changes related to personnel or mailing address of licensee. (NRS 459.201**)** A licensee shall:

1. Notify the Division by letter within 30 days after:

(a) An authorized user, authorized nuclear pharmacist, radiation safety officer or teletherapy physicist permanently discontinues performance of his duties under the license or has a change of name; or

(b) The mailing address of the licensee changes.

2. If the licensee employs an authorized user or authorized nuclear pharmacist who is identified as such on a license issued by the Nuclear Regulatory Commission or an agreement state or on a permit issued by a licensee who holds a specific license of broad scope, provide to

the Division within 30 days after the authorized user or authorized nuclear pharmacist is allowed to work as an authorized user or authorized nuclear pharmacist a copy of the license or permit.

NAC 459.3816 Duties of licensee regarding persons supervised by authorized user. (NRS 459.201**)** A licensee who employs an authorized user who:

1. Supervises the manufacture, production, acquisition, possession, use or transfer of radioactive material for medical use by a person shall:

(a) Instruct the person supervised in:

(1) The principles of radiation safety appropriate to the use of radioactive material by the person; and

(2) The written quality management program of the licensee.

(b) Require the person supervised to:

(1) Follow the instructions of the authorized user;

(2) Follow the written radiation safety and quality management procedures established by the licensee;

(3) Comply with the provisions of NAC 459.010 to 459.950, inclusive; and

(4) Comply with the conditions of the license of the licensee with respect to the use of the radioactive material.

(c) Review periodically the use of the radioactive material by the person supervised and the records that reflect the use of the radioactive material.

2. Supervises the preparation of radioactive material for medical use by a person shall:

(a) Instruct the person supervised in:

(1) The preparation of radioactive material for medical use;

(2) The principles of radiation safety appropriate to the use of radioactive material by the person; and

(3) The written quality management program of the licensee.

(b) Require the person supervised to:

(1) Follow the instructions of the authorized user;

(2) Follow the written radiation safety and quality management procedures established by the licensee;

(3) Comply with the provisions of NAC 459.010 to 459.950, inclusive; and

(4) Comply with the conditions of the license of the licensee with respect to the preparation of the radioactive material for medical use.

(c) Require the authorized user to review periodically the preparation of the radioactive material for medical use by the person supervised and the records that reflect the preparation of the radioactive material.

NAC 459.3817 Duties of licensee regarding persons supervised by authorized nuclear pharmacist. A licensee who employs an authorized nuclear pharmacist who supervises the preparation of radioactive material for medical use by a person shall:

1. Instruct the person supervised in:

(a) The preparation of radioactive material for medical use;

(b) The principles of radiation safety appropriate to the use of radioactive material by the person; and

(c) The written quality management program of the licensee.

2. Require the person supervised to:

(a) Follow the instructions of the authorized nuclear pharmacist;

(b) Follow the written radiation safety and quality management procedures established by the licensee;

(c) Comply with the provisions of NAC 459.010 to 459.950, inclusive; and

(d) Comply with the conditions of the license of the licensee with respect to the preparation of the radioactive material for medical use.

3. Require the authorized nuclear pharmacist to review periodically the preparation of the radioactive material for medical use by the person supervised and the records that reflect the preparation of the radioactive material.

NAC 459.3818 Responsibility for acts and omissions. (NRS 459.201**)** A licensee who employs an:

1. Authorized user who supervises a person pursuant to NAC 459.3816 is responsible for the acts and omissions of the authorized user and the person supervised that occur within the scope of the activity being supervised.

2. Authorized nuclear pharmacist who supervises a person pursuant to NAC 459.3817 is responsible for the acts and omissions of the authorized nuclear pharmacist and the person supervised that occur within the scope of the activity being supervised.

NAC 459.3821 Radiation safety officer: Appointment; purpose; duties. (NRS 459.201**)**

1. A licensee authorized to use radioactive material in medical procedures shall appoint a radiation safety officer who is responsible for implementing a program for radiation safety. The licensee, through the radiation safety officer, shall ensure that activities for radiation safety are being performed in accordance with approved procedures and regulatory requirements in the daily operations of the licensee that involve the use of radioactive materials.

2. The radiation safety officer shall:

(a) Investigate overexposures, accidents, spills, thefts, unauthorized receipts, uses, transfers, disposals, misadministrations and other deviations from approved radiation safety practices and implement corrective actions as necessary;

(b) Establish, collect in one binder or file, and implement written policies and procedures for:

(1) Authorizing the procurement of radioactive material;

(2) Receiving and opening packages of radioactive material;

(3) Storing radioactive material;

(4) Keeping an inventory of radioactive material;

(5) Safely using radioactive material;

(6) Taking action in an emergency if control of radioactive material is lost;

(7) Performing on a periodic basis surveys of radiation;

(8) Performing checks of instruments for surveying and other safety equipment;

(9) Disposing of radioactive material;

(10) Training personnel who work in restricted areas or who are otherwise occupationally exposed to radiation; and

(11) Keeping a copy of all records and reports required by NAC 459.010 to 459.950, inclusive, a copy of each licensing request, a copy of the license and all amendments thereto, a copy of the radiation protection program, and the written policies and procedures required by NAC 459.3801 to 459.3966, inclusive;

(c) Brief management at least once each year on the usage of radioactive material at the facility;

(d) Establish levels of exposure for personnel which, when exceeded, will be investigated by the radiation safety officer to determine the cause of the exposure and methods that can be used to prevent recurrence of the exposure; and

(e) If the licensee has a committee on radiation safety, assist the committee in the performance of its duties.

NAC 459.3824 Committee on radiation safety: Meetings; quorum; minutes; duties; records of minor changes in procedures for radiation safety. (NRS 459.201**)**

1. If established, a committee on radiation safety shall meet at least quarterly and:

(a) A quorum consisting of at least one-half of the membership of the committee, including the radiation safety officer and a representative of management, must be present to conduct a meeting.

(b) The minutes of each meeting must be recorded and include the following information:

(1) The date of the meeting;

(2) Names of members present;

(3) Names of members absent;

(4) Summary of deliberations and discussions;

(5) Recommended actions and the numerical results of all ballots; and

(6) Any reviews made of the program for radiation safety and on the adequacy of the program to keep radiation exposures as low as is reasonably achievable.

(c) Promptly provide each member with a copy of the minutes of the meeting and retain one copy for the duration of the license of the licensee.

2. To oversee the use of radioactive material, the committee shall:

(a) Review recommendations on ways to maintain individual and collective doses of radiation as low as is reasonably achievable;

(b) Review, on the basis of safety and with regard to required training and experience, standards provided in NAC 459.394 to 459.3966, inclusive, and approve or disapprove any person who is to be listed as an authorized user, an authorized nuclear pharmacist, the radiation safety officer or a teletherapy physicist before submitting an application for a license or a request for the amendment or renewal thereof;

(c) Review on the basis of safety and approve with the advice and consent of the radiation safety officer and a representative of management, or disapprove, minor changes in the procedures for radiation safety that are not potentially important to safety and that were described in the application for a license, or the renewal or amendment thereof;

(d) Review quarterly, with the assistance of the radiation safety officer, a summary of the records of the occupational dose of all personnel working with radioactive material;

(e) Review quarterly, with the assistance of the radiation safety officer, all incidents involving radioactive material to determine the cause of the incidents and recommend subsequent actions to be taken; and

(f) Review annually, with the assistance of the radiation safety officer, the program for radiation safety.

3. A licensee shall retain a record of each change made pursuant to paragraph (c) of subsection 2 until his license has been renewed or terminated. The record must include the effective date of the change, a copy of the old and new procedures for radiation safety, the reason

for the change, a summary of the matters concerning radiation safety that were considered before making the change, and, if applicable, the signatures of the chairman of the committee on radiation safety, the radiation safety officer and the representative of management.

NAC 459.3827 Duties of licensee regarding radiation safety officer and committee on radiation safety. (NRS 459.201**)**

1. A licensee shall provide the radiation safety officer and, if established, the committee on radiation safety, sufficient authority, organizational freedom, and management prerogative to:

(a) Identify problems of radiation safety;

(b) Initiate, recommend, or provide corrective actions; and

(c) Verify that corrective actions have been taken by the licensee.

2. A licensee shall establish and state in writing the authorities, duties, responsibilities, and radiation safety activities of the radiation safety officer and the committee on radiation safety, if any, and retain a record of the current edition of the statements until the Division terminates the license.

NAC 459.383 Syringes containing radioactive material. (NRS 459.201**)**

1. A licensee shall keep syringes that contain radioactive material to be administered to patients or human research subjects in a radiation shield.

2. Each syringe that contains a radiopharmaceutical or each radiation shield which contains such a syringe must be conspicuously labeled by the licensee to identify its contents. The label must identify the radiopharmaceutical name or its abbreviation, the clinical procedure to be performed, or the name of the patient or human research subject.

3. A licensee shall require each person who prepares a radiopharmaceutical kit to use a syringe radiation shield when preparing the kit and administering a radiopharmaceutical by injection unless the use of the shield is contraindicated for that patient or human research subject.

NAC 459.3835 Vials containing radiopharmaceuticals. (NRS 459.201**)**

1. A licensee shall require each person preparing or handling a vial that contains a radiopharmaceutical to keep the vial in a radiation shield.

2. Each radiation shield that contains a vial of a radiopharmaceutical must be conspicuously labeled by the licensee to identify its contents. The label must identify the name of the radiopharmaceutical or its abbreviation.

NAC 459.3841 Radiation surveys of areas used for preparation, administration or storage of radiopharmaceuticals or waste of radiopharmaceuticals; records. (NRS 459.201**)**

1. At the end of each day of use a licensee shall make a radiation survey with a radiation detection survey instrument of all areas where radiopharmaceuticals are routinely prepared for use or administered.

2. A least once each week a licensee shall survey with a radiation detection survey instrument all areas where radiopharmaceuticals or the waste of radiopharmaceuticals are stored.

3. A licensee shall conduct the surveys required pursuant to subsections 1 and 2 to detect dose rates as low as 0.1 millirem per hour.

4. A licensee shall:

(a) Establish limits for rates of radiation dosage for the surveys required by subsections 1 and 2; and

(b) Require the person who performs the survey to notify the radiation safety officer immediately if the dose rate measured exceeds the established limit.

5. Once each week a licensee shall make a radiation survey for removable radioactive contamination in all areas where radiopharmaceuticals are routinely prepared for use, administered or stored.

6. A licensee shall conduct the surveys required by subsection 5 to detect a minimum radioactive contamination level on each wipe sample of 2,000 disintegrations per minute.

7. A licensee shall:

(a) Establish limits for removable radioactive contamination for the surveys required by subsection 5; and

(b) Require the person who performs the survey to inform the radiation safety officer immediately if the amount of radioactive contamination measured exceeds the established limit.

8. A licensee shall retain a record of each survey for at least 3 years. Each record must include:

(a) The date of the survey;

(b) A plan drawing of each area surveyed;

(c) The limits established for levels of radiation or radioactive contamination for each area;

(d) The detected radiation level at several points in each area expressed in millirems per hour and the removable radioactive contamination level at several points in the area expressed in disintegrations per minute per 100 square centimeters;

(e) The identity of the survey instruments used to make the survey and to analyze the wipe samples; and

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

NAC 459.3845 Storage of volatile radiopharmaceuticals and radioactive gases. (NRS 459.201**)** A licensee shall store volatile radiopharmaceuticals and radioactive gases in a radiation shield and in the container of the shipper. A licensee shall store a multidose container in a fume hood after drawing the first dosage from it.

NAC 459.3851 Radioactive aerosols and gases; records. (NRS 459.201**)**

1. A licensee shall administer radioactive aerosols or gases in a room with a system that will keep airborne concentrations within the limits prescribed in Table I of Appendix B. The system must either be directly vented to the atmosphere through an air exhaust or provide for the collection and decay or disposal of the aerosol or gas in a shielded container.

2. A licensee may administer radioactive gases only in rooms that are at negative pressure compared to surrounding rooms.

3. Before receiving, using, or storing a radioactive gas, a licensee shall calculate the amount of time needed after a spill to reduce the concentration in the room to the occupational limit listed in Table I of Appendix B. The calculation must be based on the highest activity of the gas handled in a single container, the air volume of the room, and the measured available air exhaust rate.

4. A licensee shall make a record of the calculations required by subsection 3, including, but not limited to, the assumptions, measurements, and calculations made, and shall retain the record for the duration of use of the area. A licensee shall also post the calculated time and safety measures to be instituted in case of a spill in the area of use.

5. A licensee shall check the operation of reusable collection systems each month and measure the ventilation rates available in areas where radioactive gas is used every 6 months.

NAC 459.3855 Instruction for personnel caring for hospitalized patient receiving radiopharmaceutical therapy; records regarding instruction. (NRS 459.201**)**

1. A licensee shall provide instruction on radiation safety for all personnel caring for a patient receiving radiopharmaceutical therapy who is required to be hospitalized. The instruction must describe the procedures of the licensee for:

(a) Control of the patient;

(b) Control of visitors;

(c) Control of contamination;

(d) Control of wastes; and

(e) Notification of the radiation safety officer in case of the death of the patient or a medical emergency.

2. A licensee shall retain for at least 3 years a list of persons receiving instruction required by subsection 1, a description of the instruction, the date of instruction, and the name of the person who gave the instruction.

NAC 459.3861 Duties of licensee regarding radiopharmaceutical therapy and hospitalization of patient or human research subject; records and notification. A licensee shall, for each patient or human research subject who is receiving radiopharmaceutical therapy and is hospitalized pursuant to NAC 459.256:

1. Provide a private room with a private sanitary facility.

2. Post on the outside of the door to the room 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 administration of the dosage, measure the dose rate in the contiguous restricted and unrestricted areas with a radiation survey instrument to demonstrate compliance with the prescribed dose rates 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 the area or list of points 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. Either monitor material and items removed from the room of the patient or human research subject to determine that their radioactivity cannot be distinguished from background radiation with a radiation detection instrument set on its most sensitive scale and with no interposed shielding or handle the items removed from the room of the patient or human research subject as radioactive waste.

6. Provide the patient or human research subject with guidance regarding radiation safety that will help maintain the radiation dose to household members and the public as low as reasonably achievable before authorizing the release of the patient or human research subject.

7. Survey the room and private sanitary facility of the patient or human research subject with a radiation detection instrument for removable contamination before assigning another patient or human research subject to the room. The room must not be reassigned until removable contamination is less than 200 disintegrations per minute per 100 square centimeters.

8. Measure the thyroid burden of each person who helped prepare or administer a dosage of iodine-131 within 3 days after administering the dosage. The licensee shall retain a record of the measurement which must also contain the date of measurement, the name of the person whose thyroid burden was measured and the initials of the person who made the measurements, until the Division authorizes disposition.

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

NAC 459.3864 Tests for leakage, physical inventories, and radiation surveys of certain sources and areas of storage of certain sources; records. (NRS 459.030**,** 459.201**)** 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:

(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.

NAC 459.3867 Calibration and check for proper operation of survey instrument used to determine ambient radiation exposure rates; records. (NRS 459.201**)**

1. A licensee shall calibrate a survey instrument used to determine ambient radiation exposure rates before its first use, annually, and following repair. In calibrating the survey instrument, the licensee shall:

(a) Calibrate all scales with readings up to 1,000 millirems per hour with a radiation source;

(b) Calibrate two separated readings on each scale that must be calibrated;

(c) Conspicuously attach a correction chart or graph to the instrument; and

(d) Conspicuously make a notation on the instrument of the apparent exposure rate from a dedicated check source as determined at the time of calibration and the date of calibration.

2. When calibrating a survey instrument, a point is calibrated if the indicated exposure rate differs from the calculated exposure rate by not more than 20 percent.

3. A licensee shall check each survey instrument for proper operation with the dedicated check source on each day of use. A record of such checks is not required.

4. A licensee shall retain a record of each calibration required pursuant to this section for at least 3 years. Each record must include:

(a) A description of the calibration procedure;

(b) The date of the calibration;

(c) A description of the source used and the certified exposure rate from the source;

(d) The rates indicated by the instrument being calibrated;

(e) The correction factor deduced from the calibration data; and

(f) The signature of the person who performed the calibration.

NAC 459.3871 Brachytherapy sources: Return to storage area; radiation survey after use; records. (NRS 459.201**)**

1. A licensee shall, after removing brachytherapy sources from a patient or human research subject, promptly return the brachytherapy sources to the storage area and count the number returned to ensure that all sources taken from the storage area have been returned.

2. A licensee shall make a record of the use of brachytherapy sources, which must include:

(a) The names of the persons permitted to handle the sources;

(b) The number and activity of sources removed from storage, the time and date they were removed from storage, the name and room number of the patient or human research subject, the number and activity of the sources in storage after the removal and the initials of the person who removed the sources from storage; and

(c) The number and activity of the sources returned to storage, the time and date they were returned to storage, the name and room number of the patient or human research subject, the number and activity of the sources in storage after the return and the initials of the person who returned the sources to storage.

3. Immediately after implanting sources in a patient or human research subject, a licensee shall make a radiation survey of the patient or human research subject and the area of use to confirm that no sources have been misplaced. The licensee shall make a record of each survey.

4. A licensee shall retain for at least 3 years the records required by subsections 2 and 3.

NAC 459.3875 Implant therapy: Instruction on radiation safety for persons caring for patient or human research subject; records regarding instruction. (NRS 459.201**)**

1. A licensee shall provide instruction on radiation safety to all persons caring for a patient or human research subject undergoing implant therapy. To satisfy this requirement, the instruction must describe:

(a) The size and appearance of the brachytherapy sources;

(b) Procedures for the safe handling of, and instructions for shielding in case of, a dislodged source;

(c) Procedures for patient control or human research subject control;

(d) Procedures for visitor control; and

(e) Procedures for notifying the radiation safety officer if the patient or human research subject dies or has a medical emergency.

2. A licensee shall retain for at least 3 years a record of persons receiving instruction required by subsection 1, a description of the instruction, the date of instruction and the name of the person who gave the instruction.

NAC 459.3881 Implant therapy: Duties of licensee regarding patient or human research subject. (NRS 459.030**,** 459.201**)** 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.

NAC 459.3884 Teletherapy: Scope of provisions. (NRS 459.201**)** The provisions of NAC 459.3887 to 459.3935, inclusive, govern the use of teletherapy units for medical use that contain a sealed source of cobalt-60 or cesium-137.

NAC 459.3887 Teletherapy: Requirement for persons who maintain or repair sealed sources and units. (NRS 459.201**)** Only a person licensed by the State of Nevada, the Nuclear Regulatory Commission, or an agreement state to perform maintenance and repair of a teletherapy unit may:

1. Install, relocate, or remove a teletherapy sealed source or a teletherapy unit that contains a sealed source; or

2. Maintain, adjust, or repair a source drawer, the shutter, or other mechanism of a teletherapy unit that could expose the source, reduce the shielding around the source, or result in increased radiation levels.

NAC 459.3891 Teletherapy: Changes which require amendment to license. (NRS 459.201**)** A licensee must apply for and receive an amendment to his license before:

1. Making any change in the shielding of a treatment room;

2. Making any change in the location of the teletherapy unit within the treatment room;

3. Using the teletherapy unit in a manner that could result in increased radiation levels in areas outside of the treatment room;

4. Relocating the teletherapy unit; or

5. Allowing a person not listed on the license of the licensee to perform the duties of the teletherapy physicist.

NAC 459.3895 Teletherapy: Posting of instructions at unit; instruction for operators of unit; records regarding instruction. (NRS 459.201**)**

1. A licensee shall post instructions at the teletherapy unit console which inform the operator of:

(a) The procedure to be followed to ensure that only the patient or human research subject is in the treatment room before turning the primary beam of radiation on to begin a treatment or after a door interlock interruption;

(b) The procedure to be followed if the operator is unable to turn the primary beam of radiation off with controls outside the treatment room or if any other abnormal operation occurs; and

(c) The names and telephone numbers of the authorized users and the radiation safety officer to be contacted immediately if the teletherapy unit or console operates abnormally.

2. A licensee shall provide instruction concerning the information specified in subsection 1 to all persons who operate a teletherapy unit.

3. A licensee shall retain for at least 3 years a record of all persons receiving instruction pursuant to subsection 2, which must include:

(a) A description of the instruction;

(b) The date of instruction; and

(c) The name of the person who gave the instruction.

NAC 459.3901 Teletherapy: General requirements for room and protection of persons entering room; records. (NRS 459.201**)**

1. A licensee shall control access to the room for teletherapy by a door at each entrance.

2. A licensee shall equip each entrance to the room for teletherapy with an electrical interlock system that will:

(a) Prevent the operator from turning the primary beam of radiation on unless the entrance door for each treatment room is closed;

(b) Turn the primary beam of radiation off immediately when an entrance door is opened; and

(c) Prevent the primary beam of radiation from being turned on following an interlock interruption until all entrance doors to the treatment room are closed and the beam on-off control is reset at the console.

3. A licensee shall equip each entrance to the room for teletherapy with a light that indicates the condition of the beam.

4. A licensee shall install in each room for teletherapy a permanent radiation monitor which must:

(a) Be capable of continuously monitoring the status of the beam of radiation.

(b) Provide visible notice of a malfunction of the teletherapy machine that results in an exposed or partially exposed source, and must be observable by a person entering the room for teletherapy.

(c) Be equipped with a back-up power supply separate from the power supply to the teletherapy unit. The back-up power supply may be a battery system.

(d) Be checked with a dedicated check source for proper operation each day before the teletherapy unit is used for the treatment of patients or human research subjects.

5. A licensee shall maintain a record for at least 3 years after the checks required by paragraph (d) of subsection 4. The record must include:

(a) The date of each check;

(b) A notation that the monitor indicates when its detector is and is not exposed; and

(c) The initials of the person who performed each check.

6. If a radiation monitor is inoperable, a licensee shall require each natural person entering the teletherapy room to use a survey instrument or audible alarm personal dosimeter to monitor for any malfunction of the source exposure mechanism that may result in an exposed or partially exposed source. The instrument or dosimeter must be checked with a dedicated check source for proper operation at the beginning of each day of use. The licensee shall keep a record as described in subsection 5.

7. A licensee shall promptly repair or replace the radiation monitor if it is inoperable.

8. A licensee shall construct or equip each room for teletherapy to permit continuous observation of the patient or human research subject from the teletherapy unit console during irradiation.

NAC 459.3905 Teletherapy: Requirements for portable radiation detection survey instrument. (NRS 459.201**)** A licensee authorized to use radioactive material in a teletherapy unit shall have in his possession either a portable radiation detection survey instrument capable of detecting dosage rates between 0.1 millirem per hour and 100 millirems per hour or a portable radiation detection survey instrument capable of measuring dosage rates between 1 millirem per hour and 1,000 millirems per hour.

NAC 459.3911 Teletherapy: Calibrated dosimetry system; dosimetry system for spot-check measurements; records. (NRS 459.201**)**

1. A licensee shall have a calibrated dosimetry system available for use. The system must have been calibrated either:

(a) By the National Institute of Standards and Technology or by a calibration laboratory accredited by the American Association of Physicists in Medicine, which calibration must have been performed within the previous 2 years and after any servicing that may have affected system calibration; or

(b) Within the previous 4 years, and 18 to 30 months after that calibration the system must have been intercompared at an intercomparison meeting with another dosimetry system that was calibrated within the past 24 months by the National Institute of Standards and Technology or by a calibration laboratory certified by the American Association of Physicists in Medicine.

2. The intercomparison meeting specified in subsection 1 must have been sanctioned by a calibration laboratory or radiologic physics center accredited by the American Association of Physicists in Medicine. The results of the intercomparison meeting must have indicated that the calibration factor of the system of the licensee had not changed by more than 2 percent. A licensee may not use the intercomparison result to change the calibration factor. When intercomparing dosimetry systems to be used for calibrating cobalt-60 teletherapy units, the licensee shall use a teletherapy unit with a cobalt-60 source. When intercomparing dosimetry systems to be used for calibrating cesium-137 teletherapy units, the licensee shall use a teletherapy unit with a cesium-137 source.

3. A licensee shall have available for use a dosimetry system for spot-check measurements. The system may be compared with a system that has been calibrated in accordance with subsections 1 and 2. This comparison must have been performed within the previous year and after each servicing that may have affected system calibration. The spot-check system may be the same system used to satisfy the requirements of subsections 1 and 2.

4. A licensee shall retain a record of each calibration, intercomparison, and comparison for the duration of the license. Each record must include:

(a) The date of each calibration, intercomparison, and comparison;

(b) The model numbers and serial numbers of the instruments that were calibrated, intercompared, or compared;

(c) The correction factor that was determined from an intercomparison;

(d) The names of the persons who performed the calibration, intercomparison, or comparison; and

(e) Evidence that the intercomparison meeting was sanctioned by a calibration laboratory or radiologic physics center accredited by the American Association of Physicists in Medicine.

NAC 459.3914 Teletherapy: Full calibration measurements on unit; physical decay corrections; records. (NRS 459.201**)**

1. A licensee authorized to use a teletherapy unit for medical use shall perform full calibration measurements on each teletherapy unit:

(a) Before the first medical use of the unit;

(b) Before medical use under the following conditions:

(1) Whenever spot-check measurements indicate that the output differs by more than 5 percent from the output obtained at the last full calibration corrected mathematically for radioactive decay;

(2) Following replacement of the source or following reinstallation of the teletherapy unit in a new location;

(3) Following any repair of the teletherapy unit that includes removal of the source or major repair of the components associated with the source exposure assembly; and

(c) At intervals not exceeding 1 year.

2. Full calibration measurements must include a determination of:

(a) The output within plus or minus 3 percent for the range of field sizes and for the distance or range of distances used for medical use;

(b) The coincidence of the radiation field and the field indicated by the light beam localizing devices;

(c) The uniformity of the radiation field and its dependence on the orientation of the useful beam;

(d) Timer accuracy and linearity over the range of use;

(e) On-off error; and

(f) Accuracy of all distance measuring and localization devices in medical use.

3. A licensee shall use the dosimetry system described in subsection 1 of NAC 459.3911 to measure the output for one set of exposure conditions. The remaining radiation measurements required by paragraph (a) of subsection 2 of this section may be made using a dosimetry system that indicates relative dose rates.

4. A licensee shall make full calibration measurements required by subsection 1 of this section in accordance with the procedures recommended by Task Group 21 of the Radiation Therapy Committee of the American Association of Physicists in Medicine that are described in Medical Physics Vol. 10, No. 6, 1983, pp. 741-771, and Vol. 11, No. 2, 1984, p. 213, or in accordance with procedures comparable to those recommended by Task Group 21 which have been approved by the Division.

5. A licensee shall correct mathematically the outputs determined in paragraph (a) of subsection 2 for physical decay for intervals not exceeding 1 month for cobalt-60 or 6 months for cesium-137.

6. Full calibration measurements required by subsection 1 and physical decay corrections required by subsection 5 must be performed by the teletherapy physicist of the licensee.

7. A licensee shall retain a record of each calibration for the duration of use of the teletherapy unit source. Each record must include:

(a) The date of the calibration;

(b) The name of the manufacturer, model number, and serial number for both the teletherapy unit and the source;

(c) The model numbers and serial numbers of the instruments used to calibrate the teletherapy unit;

(d) The tables that describe the output of the unit over the range of field sizes and for the range of distances used in radiation therapy;

(e) A determination of the coincidence of the radiation field and the field indicated by the light beam localizing device;

(f) An assessment of timer linearity and constancy, the calculated on-off error, and the estimated accuracy of each distance measuring or localization device; and

(g) The signature of the teletherapy physicist.

NAC 459.3917 Teletherapy: Output spot checks on unit; safety spot checks and repair of facility; records. (NRS 459.201**)**

1. A licensee authorized to use teletherapy units for medical use shall perform output spot checks on each teletherapy unit once in each calendar month that include a determination of:

(a) Timer constancy and timer linearity over the range of use;

(b) On-off error;

(c) The coincidence of the radiation field and the field indicated by the beam localization device;

(d) The accuracy of all distance measuring and localization devices used for medical use;

(e) The output for one typical set of operating conditions measured with the dosimetry system described in subsection 3 of NAC 459.3911; and

(f) The difference between the measurements made in paragraph (e) of this subsection and the anticipated output, expressed as a percentage of the anticipated output.

2. A licensee shall perform the measurements required by subsection 1 in accordance with procedures established by the teletherapy physicist, but the teletherapy physicist need not actually perform the measurements.

3. A licensee shall have the teletherapy physicist review the results of each spot-check measurement within 15 days. The teletherapy physicist shall promptly notify the licensee in writing of the results of his review of each spot-check measurement. The licensee shall keep a copy of each written notification for at least 3 years.

4. A licensee authorized to use a teletherapy unit for medical use shall perform safety spot checks of each facility for teletherapy at least once in each calendar month that assure proper operation of:

(a) Electrical interlocks at each entrance to a room for teletherapy;

(b) Electrical or mechanical stops installed for the purpose of limiting use of the primary beam of radiation;

(c) Lights that indicate the condition of the beam on the teletherapy unit, on the control console, and in the facility;

(d) Viewing systems;

(e) Doors on treatment rooms from inside and outside the rooms; and

(f) Electrically assisted doors on treatment rooms with the electrical power to the teletherapy unit turned off.

5. A licensee shall arrange for the prompt repair of each item specified in subsection 4 that is not operating properly, and shall not use the teletherapy unit following a door interlock malfunction until the interlock system has been repaired.

6. A licensee shall retain a record of each spot check required by subsections 1 to 4, inclusive, for a least 3 years. Each record must include:

(a) The date of the spot check;

(b) The name of the manufacturer, model number, and serial number of both the teletherapy unit and source;

(c) The name of the manufacturer, model number, and serial number of the instrument used to measure the output of the teletherapy unit;

(d) An assessment of timer constancy and linearity;

(e) The calculated on-off error;

(f) A determination of the coincidence of the radiation field and the field indicated by the light beam localizing device;

(g) The determined accuracy of each distance measuring or localization device;

(h) The difference between the anticipated output and the measured output;

(i) Notations indicating the operability of each entrance door electrical interlock, each electrical or mechanical stop, each light that indicates the condition of the beam, the viewing system, and doors; and

(j) The signature of the person who performed the periodic spot check.

NAC 459.392 Teletherapy: General requirements for safety checks of facility; records. (NRS 459.201**)**

1. A licensee shall promptly check all systems listed in subsection 4 of NAC 459.3917 for proper function after each installation of a teletherapy source and after making a change in the teletherapy installation for which an amendment of his license was required by subsections 1 to 4, inclusive, of NAC 459.3891.

2. If the results of the checks required by subsection 1 indicate the malfunction of any system specified in subsection 4 of NAC 459.3917, the licensee shall lock the control console in the "off" position and not use the unit except as may be necessary to repair, replace, or check the malfunctioning system.

3. A licensee shall retain for at least 3 years a record of the facility checks following installation of a source. Each record must include:

(a) Notations indicating the operability of each entrance interlock, each electrical or mechanical stop, and each light that indicates the condition of the beam, the viewing system and the doors; and

(b) The signature of the radiation safety officer.

NAC 459.3924 Teletherapy: Radiation surveys for verification of dose rates and dose quantities per unit of time; records. (NRS 459.030**,** 459.201**)**

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 rates in restricted areas are not likely to cause an occupational dose to an adult in excess of the limits specified in NAC 459.325; and

(2) Radiation dose rates in controlled or unrestricted areas 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.

NAC 459.3927 Teletherapy: Excessive radiation levels in unrestricted areas. (NRS 459.030**,** 459.201**)**

1. If the survey required by NAC 459.3924 indicates that 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) 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.

NAC 459.393 Teletherapy: Mailing of copy of report of survey measurements to Division. (NRS 459.201**)** A licensee shall mail a copy of the reports required by NAC 459.392, 459.3924, and 459.3927 and a report of the output from the teletherapy source expressed as roentgens or rads per hour at a distance of 1 meter from the source and determined during the full calibration required by NAC 459.3914 to the Division within 30 days after the survey measurements have been recorded.

NAC 459.3935 Teletherapy: Inspection and servicing of unit; records. (NRS 459.201**)**

1. A licensee shall have each teletherapy unit fully inspected and serviced during the replacement of the teletherapy source or at intervals not to exceed 5 years, whichever comes first, to assure proper functioning of the source exposure mechanism.

2. The inspection and servicing may only be performed by person, specifically licensed to do so by the State of Nevada, the Nuclear Regulatory Commission, or an agreement state.

3. A licensee shall keep a record of the inspection and servicing for the duration of the license. The record must include:

(a) The name of the inspector;

(b) The license number of the inspector;

(c) The date of the inspection;

(d) The name of the manufacturer and the model number and serial number of both the teletherapy unit and source;

(e) A list of the components inspected, serviced, and replaced; and

(f) The signature of the inspector.

NAC 459.394 Qualifications of radiation safety officer. (NRS 459.030**,** 459.201**)** 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; 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.

NAC 459.3942 Exemption from training requirements for radiation safety officer. (NRS 459.201**)** A person identified as a radiation safety officer by the State of Nevada, the Nuclear Regulatory Commission, or an agreement state on a license issued before October 1, 1986, need not comply with the training requirements of NAC 459.394.

NAC 459.3944 Qualifications of authorized user of radiopharmaceutical in uptake, dilution or excretion studies. (NRS 459.201**)** Except as otherwise provided in NAC 459.3962 and 459.3964, a licensee shall require the authorized user of a radiopharmaceutical in uptake, dilution or excretion studies to be a physician who:

1. Is certified in one of the following specialties:

(a) Nuclear medicine by the American Board of Nuclear Medicine;

(b) Diagnostic radiology by the American Board of Radiology;

(c) Diagnostic radiology or radiology by the American Osteopathic Board of Radiology;

(d) Nuclear medicine by the American Osteopathic Board of Nuclear Medicine; or

(e) Nuclear medicine by the Royal College of Physicians and Surgeons of Canada;

2. Has received classroom and laboratory training in basic radioisotope techniques applicable to the use of prepared radiopharmaceuticals, and has the following supervised clinical experience:

(a) At least 40 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 20 hours of supervised clinical experience under the supervision of an authorized user which included:

(1) Examining patients or human research subjects and reviewing their case histories to determine their suitability for radioisotope diagnosis, limitations or contraindication;

(2) Selecting the suitable radiopharmaceuticals and calculating and measuring the dosages;

(3) Administering dosages to patients or human research subjects and using radiation shields for syringes;

(4) Collaborating with the authorized user in the interpretation of radioisotope test results; and

(5) Patient or human research subject follow-up;

3. Has successfully completed a 6-month training program in nuclear medicine as part of a training program that has been approved by the Accreditation Council for Graduate Medical Education and which included classroom and laboratory training, work experience, and supervised clinical experience in all the topics identified in subsection 2; or

4. Is identified as an authorized user of a radiopharmaceutical in uptake, dilution or excretion studies on a:

(a) License issued by the Nuclear Regulatory Commission or an agreement state that authorizes the medical use of radioactive material; or

(b) Permit issued by a licensee who holds a specific license of broad scope which authorizes the medical use of radioactive material.

NAC 459.3946 Qualifications of authorized user of radiopharmaceutical, generator or reagent kit in imaging or localization studies. (NRS 459.201**)** Except as otherwise provided in NAC 459.3962 and 459.3964, a licensee shall require the authorized user of a radiopharmaceutical, generator or reagent kit in imaging or localization studies to be a physician who:

1. Is certified in one of the following specialties:

(a) Nuclear medicine by the American Board of Nuclear Medicine;

(b) Diagnostic radiology by the American Board of Radiology;

(c) Diagnostic radiology or radiology by the American Osteopathic Board of Radiology;

(d) Nuclear medicine by the American Osteopathic Board of Nuclear Medicine; or

(e) Nuclear medicine by the Royal College of Physicians and Surgeons of Canada;

2. Has received classroom and laboratory training in basic techniques for handling radioisotopes applicable to the use of prepared radiopharmaceuticals, generators and reagent kits, and has the following supervised work experience and supervised clinical experience:

(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) Radiopharmaceutical chemistry; and

(5) Radiation biology;

(b) At least 500 hours of supervised work experience under the supervision of an authorized user that included:

(1) Ordering, receiving and safely unpacking radioactive materials and performing related radiation surveys;

(2) Calibrating dose calibrators and diagnostic instruments and performing checks for proper operation of survey meters;

(3) Calculating and safely preparing dosages for patients or human research subjects;

(4) Using administrative controls to prevent the misadministration of radioactive material;

(5) Using procedures to contain safely radioactive material which has spilled and using proper procedures for decontamination; and

(6) Eluting technetium-99m from generator systems, measuring and testing the eluate for molybdenum-99 and alumina contamination, and processing the eluate with reagent kits to prepare technetium-99m labeled radiopharmaceuticals; and

(c) At least 500 hours of supervised clinical experience under the supervision of an authorized user that included:

(1) Examining patients or human research subjects and reviewing their case histories to determine their suitability for radioisotope diagnosis, limitations or contraindications;

(2) Selecting the suitable radiopharmaceuticals and calculating and measuring the dosages;

(3) Administering dosages to patients or human research subjects and using radiation shields for syringes;

(4) Collaborating with the authorized user in the interpretation of results of the radioisotope test; and

(5) Patient or human research subject follow-up;

3. Has successfully completed a 6-month program for training in nuclear medicine that has been approved by the Accreditation Council for Graduate Medical Education and which included classroom and laboratory training, work experience and supervised clinical experience in all the topics identified in subsection 2; or

4. Is identified as an authorized user of a radiopharmaceutical, generator or reagent kit in imaging or localization studies on a:

(a) License issued by the Nuclear Regulatory Commission or an agreement state that authorizes the medical use of radioactive material; or

(b) Permit issued by a licensee who holds a specific license of broad scope which authorizes the medical use of radioactive material.

NAC 459.3948 Qualifications of authorized user of radiopharmaceuticals in therapeutic use of unsealed radioactive material. (NRS 459.201**)** Except as otherwise provided in NAC

459.3962, a licensee shall require an authorized user of radiopharmaceuticals in therapeutic procedures to be a physician who:

1. Is certified by one of the following organizations:

(a) The American Board of Nuclear Medicine;

(b) The American Board of Radiology, in radiology, therapeutic radiology or radiation oncology;

(c) The American Osteopathic Board of Radiology, after 1984; or

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

2. Has received classroom and laboratory training in basic radioisotope techniques applicable to the use of therapeutic radiopharmaceuticals, and has the following supervised clinical experience:

(a) At least 80 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; and

(4) Radiation biology; and

(b) Supervised clinical experience under the supervision of an authorized user at a medical institution which included:

(1) The use of iodine-123 or iodine-131 for diagnosis of thyroid function and the use of iodine-131 for treatment of hyperthyroidism or cardiac dysfunction in at least 10 persons; and

(2) The use of iodine-131 for treatment of thyroid carcinoma in at least 3 persons; or

3. Is identified as an authorized user of radiopharmaceuticals in therapeutic procedures on a:

(a) License issued by the Nuclear Regulatory Commission or an agreement state that authorizes the medical use of radioactive material; or

(b) Permit issued by a licensee that holds a specific license of broad scope which authorizes the medical use of radioactive material.

NAC 459.395 Qualifications of authorized user of only iodine-131 for treatment of hyperthyroidism. (NRS 459.201**)** Except as otherwise provided in NAC 459.3962, a licensee shall require an authorized user of only iodine-131 for the treatment of hyperthyroidism to be a physician who has experience in treating thyroid disease, who has received classroom and laboratory training in basic techniques for the handling of radioisotopes applicable to the use of iodine-131 for treating hyperthyroidism, and who:

1. Has the following supervised clinical experience:

(a) At least 80 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; and

(4) Radiation biology; and

(b) Supervised clinical experience under the supervision of an authorized user which included the use of iodine-123 or iodine-131 for the diagnosis of thyroid function, and the use of iodine-131 for the treatment of hyperthyroidism in at least 10 persons; or

2. Is identified as an authorized user of only iodine-131 for the treatment of hyperthyroidism on a:

(a) License issued by the Nuclear Regulatory Commission or an agreement state that authorizes the medical use of radioactive material; or

(b) Permit issued by a licensee who holds a specific license of broad scope which authorizes the medical use of radioactive material.

NAC 459.3952 Qualifications of authorized user of only iodine-131 for treatment of thyroid carcinoma. (NRS 459.201**)** Except as otherwise provided in NAC 459.3962, a licensee shall require an authorized user of only iodine-131 for the treatment of thyroid carcinoma to be a physician who:

1. Has experience in treating thyroid disease, who has received classroom and laboratory training in basic techniques for the handling of radioisotopes applicable to the use of iodine-131 for treating thyroid carcinoma, and who has the following supervised clinical experience:

(a) At least 80 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; and

(4) Radiation biology; and

(b) Supervised clinical experience under the supervision of an authorized user which included the use of iodine-131 for the treatment of thyroid carcinoma in at least three persons; or

2. Is identified as an authorized user of only iodine-131 for the treatment of thyroid carcinoma on a:

(a) License issued by the Nuclear Regulatory Commission or an agreement state that authorizes the medical use of radioactive material; or

(b) Permit issued by a licensee who holds a specific license of broad scope which authorizes the medical use of radioactive material.

NAC 459.3954 Qualifications of authorized user of brachytherapy source in therapy procedures. (NRS 459.201**)** Except as otherwise provided in NAC 459.3962, a licensee shall require an authorized user of a brachytherapy source in therapy procedures to be a physician who:

1. Is certified in one of the following specialties:

(a) Radiology, therapeutic radiology or radiation oncology by the American Board of Radiology;

(b) Radiation oncology by the American Osteopathic Board of Radiology;

(c) Radiology, with specialization in radiotherapy, as a British "Fellow of the Faculty of Radiology" or "Fellow of the Royal College of Radiology"; or

(d) Therapeutic radiology by the Canadian Royal College of Physicians and Surgeons;

2. Is in an active practice of therapeutic radiology, who has received classroom and laboratory training in basic techniques for the handling of radioisotopes applicable to the therapeutic use of brachytherapy sources and who has the following supervised work experience and supervised clinical experience:

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

(1) Radiation physics and instrumentation;

(2) Radiation protection;

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

(4) Radiation biology;

(b) At least 500 hours of supervised work experience under the supervision of an authorized user at a medical institution which included:

(1) Ordering, receiving and safely unpacking radioactive material and performing related radiation surveys;

(2) Checking survey meters for proper operation;

(3) Preparing, implanting and removing sealed sources;

(4) Maintaining accurate inventories of brachytherapy sources;

(5) Using administrative controls to prevent the misadministration of radioactive material; and

(6) Using procedures for emergencies to control radioactive material; and

(c) At least 3 years of supervised clinical experience that included at least 1 year in a formal training program approved by the Residency Review Committee for Radiology of the Accreditation Council for Graduate Medical Education or the Committee on Postdoctoral Training of the American Osteopathic Association, and at least an additional 2 years of clinical experience in therapeutic radiology under the supervision of an authorized user at a medical institution that included:

(1) Examining persons and reviewing their case histories to determine their suitability for brachytherapy treatment and any limitations or contraindications;

(2) Selecting the proper brachytherapy sources and dose and method of administration;

(3) Calculating the dose; and

(4) Postadministration follow-up and review of case histories in collaboration with the authorized user; or

3. Is identified as an authorized user of a brachytherapy source in therapy procedures on a:

(a) License issued by the Nuclear Regulatory Commission or an agreement state that authorizes the medical use of radioactive material; or

(b) Permit issued by a licensee who holds a specific license of broad scope which authorizes the medical use of radioactive material.

NAC 459.3956 Qualifications of authorized user of only strontium-90 for ophthalmic radiotherapy. (NRS 459.201**)** Except as otherwise provided in NAC 459.3962, a licensee shall require an authorized user of only strontium-90 for ophthalmic radiotherapy to be a physician who:

1. Is in the active practice of therapeutic radiology or ophthalmology, and who has received the following classroom and laboratory training in basic techniques for the handling of radioisotopes applicable to the use of strontium-90 for ophthalmic radiotherapy:

(a) At least 24 hours of classroom and laboratory training that included:

(1) Radiation physics and instrumentation;

(2) Radiation protection;

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

(4) Radiation biology; and

(b) Supervised clinical training in ophthalmic radiotherapy under the supervision of an authorized user at a medical institution that included the use of strontium-90 for the ophthalmic treatment of at least five persons which included:

(1) Examination of each person to be treated;

(2) Calculation of the dose to be administered;

(3) Administration of the dose; and

(4) Follow-up and review of the case history of each patient; or

2. Is identified as an authorized user of only strontium-90 for ophthalmic therapy on a:

(a) License issued by the Nuclear Regulatory Commission or an agreement state that authorizes the medical use of radioactive material; or

(b) Permit issued by a licensee who holds a specific license of broad scope which authorizes the medical use of radioactive material.

NAC 459.3958 Qualifications of authorized user of sealed source in teletherapy unit. (NRS 459.201**)** Except as otherwise provided in NAC 459.3962, a licensee shall require an authorized user of a sealed source in a teletherapy unit to be a physician who:

1. Is certified in one of the following specialties:

(a) Radiology, therapeutic radiology or radiation oncology by the American Board of Radiology;

(b) Radiation oncology by the American Osteopathic Board of Radiology;

(c) Radiology with specialization in radiotherapy, as a British "Fellow of the Faculty of Radiology" or "Fellow of the Royal College of Radiology"; or

(d) Therapeutic radiology by the Canadian Royal College of Physicians and Surgeons;

2. Is in the active practice of therapeutic radiology, who has received classroom and laboratory training in basic techniques for the handling of radioisotopes applicable to the use of a sealed source in a teletherapy unit and who has the following supervised work experience and supervised clinical experience:

(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; and

(4) Radiation biology;

(b) At least 500 hours of supervised work experience under the supervision of an authorized user at a medical institution which included:

(1) Reviewing the full calibration measurements and periodic spot-checks;

(2) Preparing treatment plans and calculating treatment times;

(3) Using administrative controls to prevent misadministrations;

(4) Implementing procedures for emergencies to be followed in the event of the abnormal operation of a teletherapy unit or console; and

(5) Checking and using survey meters; and

(c) At least 3 years of supervised clinical experience that included at least 1 year in a formal training program approved by the Residency Review Committee for Radiology of the Accreditation Council for Graduate Medical Education or the Committee on Postdoctoral Training of the American Osteopathic Association and at least an additional 2 years of clinical experience in therapeutic radiology under the supervision of an authorized user at a medical institution which included:

(1) Examining persons and reviewing their case histories to determine their suitability for teletherapy treatment and any limitations or contraindications;

(2) Selecting the proper dose and how it is to be administered;

(3) Calculating the teletherapy doses and collaborating with the authorized user in the review of the progress of patients or human research subjects and consideration of the need to modify originally prescribed doses as warranted by the reaction of patients or human research subjects to radiation; and

(4) Postadministration follow-up and review of case histories; or

3. Is identified as an authorized user of a sealed source in a teletherapy unit on a:

(a) License issued by the Nuclear Regulatory Commission or an agreement state that authorizes the medical use of radioactive material; or

(b) Permit issued by a licensee who holds a specific license of broad scope which authorizes the medical use of radioactive material.

NAC 459.3959 Qualifications of authorized user of sealed source for diagnosis. (NRS 459.201**)** Except as otherwise provided in NAC 459.3962, a licensee shall require an authorized user of a sealed source in a device described in subsection 1 of NAC 459.2565 to be a physician who:

1. Is certified in:

(a) Radiology, diagnostic radiology, therapeutic radiology or radiation oncology by the American Board of Radiology;

(b) Nuclear medicine by the:

(1) American Board of Nuclear Medicine; or

(2) Royal College of Physicians and Surgeons of Canada; or

(c) Radiology or diagnostic radiology by the American Osteopathic Board of Radiology;

2. Has completed 8 hours of classroom and laboratory training in basic techniques of handling radioisotopes specifically applicable to the device that includes, without limitation:

(a) Radiation physics, mathematics pertaining to the use and measurement of radioactivity and instrumentation;

(b) Radiation biology;

(c) Radiation protection; and

(d) Training in the operation of the device for the uses to which the authorized user will put the device; or

3. Is identified as an authorized user of a sealed source in a device described in subsection 1 of NAC 459.2565 on a:

(a) License issued by the Nuclear Regulatory Commission or an agreement state that authorizes the medical use of radioactive material; or

(b) Permit issued by a licensee who holds a specific license of broad scope which authorizes the medical use of radioactive material.

NAC 459.396 Qualifications of teletherapy physicist. (NRS 459.201**)** A licensee shall require the teletherapy physicist to be a person who:

1. Is certified by the American Board of Radiology in:

(a) Therapeutic radiology physics;

(b) Roentgen ray and gamma ray physics;

(c) X-ray and radium physics; or

(d) Radiological physics;

2. Is certified by the American Board of Medical Physics, in radiation oncology physics; or

3. Holds a master's or doctorate degree in physics, biophysics, radiological physics or health physics, and has completed at least 1 year of full-time training in therapeutic radiological physics and at least an additional 1 year of full-time work experience under the supervision of a teletherapy physicist at a medical institution that included the tasks set forth in NAC 459.3864, 459.3914, 459.3917 and 459.3924.

NAC 459.3961 Qualifications of authorized nuclear pharmacist. (NRS 459.201**)**

1. A licensee shall require an authorized nuclear pharmacist who is employed by the licensee to be a pharmacist who:

(a) Is certified as a nuclear pharmacist by the Board of Pharmaceutical Specialties;

(b) Has completed 700 hours in a structured educational program consisting of:

(1) Didactic training in:

(I) Radiation physics and instrumentation;

(II) Radiation protection;

(III) Radiation biology;

(IV) Chemistry of radioactive material for medical use; and

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

(2) Supervised experience in nuclear pharmacy, including, without limitation:

(I) Shipping and receiving of radioactive material for medical use and performing related radiation surveys;

(II) Using and performing checks for proper operation of dose calibrators, survey meters and, if appropriate, instruments used to measure alpha- or beta-emitting radionuclides;

(III) Calculating, assaying and preparing dosages for patients or human research subjects safely;

(IV) Using administrative controls to avoid mistakes in the administration of radioactive material;

(V) Using procedures to prevent or minimize contamination; and

(VI) Using procedures for decontamination; or

(c) Is identified as an authorized nuclear pharmacist on a:

(1) License that authorizes the use of radioactive material in the practice of nuclear pharmacy and is issued by the Nuclear Regulatory Commission or an agreement state; or

(2) Permit issued by a licensee who holds a specific license of broad scope which authorizes the use of radioactive material in the practice of nuclear pharmacy.

2. Except as otherwise provided in subsection 3, the licensee shall also require the authorized nuclear pharmacist described in paragraph (b) of subsection 1 to obtain a certification written and signed by an authorized nuclear pharmacist who is an instructor that the training required in paragraph (b) of subsection 1 was completed and the authorized nuclear pharmacist is competent to operate a nuclear pharmacy independently.

3. A licensee may apply to the Division for an amendment to a license that identifies an experienced nuclear pharmacist as an authorized nuclear pharmacist. If the amendment is issued, the licensee is not required to comply with subsection 2. The Division will not grant such an amendment unless the experienced nuclear pharmacist:

(a) Is currently working in a nuclear pharmacy; and

(b) Has completed the educational program as set forth in paragraph (b) of subsection 1 before August 31, 1998.

NAC 459.3962 Exemption from training requirements for certain authorized users. (NRS 459.201**)** A physician identified as an authorized user of radioactive material on a license issued before April 1, 1987, by the State of Nevada, the Nuclear Regulatory Commission, or an agreement state who performs only those methods of use for which he was authorized on that date need not comply with the training requirements of NAC 459.3944 to 459.3958, inclusive.

NAC 459.3964 Exemption from requirements of NAC 459.3944 **and** 459.3946 **for certain physicians. (**NRS 459.201**)** A physician who, before July 1, 1984, began a 3-month training program in nuclear medicine approved by the Accreditation Council for Graduate Medical Education and successfully completed the program need not comply with the requirements of NAC 459.3944 or 459.3946.

NAC 459.3966 Time requirement for training and experience of applicant to become authorized user. (NRS 459.201**)** The training and experience specified in NAC 459.394 to 459.3961, inclusive, must have been obtained within the 7 years immediately preceding the date of application of the person to become an authorized user on a license, or the person must have had related continuous education and experience since the required training and experience was completed.