ADOPTED REGULATION OF

THE STATE BOARD OF HEALTH

LCB File No. R084-98

Effective January 26, 1999

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

AUTHORITY: §§ 2-144, NRS 459.030.

Section 1. Chapter 459 of NAC is hereby amended by adding thereto the provisions set forth as sections 2 to 30, inclusive, of this regulation.

Sec. 2. *"Authorized nuclear pharmacist" means a person who meets the requirements set forth in subsection 1 of section 29 of this regulation.*

Sec. 3. *"Chemical description" means a description of the principal chemical characteristics of low-level radioactive waste.*

Sec. 4. *"Consignee" means the designated receiver of a shipment of low-level radioactive waste.*

Sec. 5. *"Disposal container":*

1. Means a container that is used to confine low-level radioactive waste for disposal at a land disposal facility.

2. May include the container used to transport the low-level radioactive waste to the land disposal facility.

Sec. 6. *"Land disposal facility" means the land, buildings, structures and equipment that are intended to be used for the disposal of radioactive waste.*

Sec. 7. *"Medical use of radioactive material" or "medical use" means the intentional internal or external administration of:*

1. Licensed radioactive material or radiation therefrom; or

2. Radiation from a machine that produces radiation,

to patients or human research subjects under the supervision of an authorized user.

Sec. 8. *"Package" means the assembly of the components necessary to comply with the regulations of the United States Department of Transportation relating to packaging and the radioactive contents of the package, as presented for transport.*

Sec. 9. *"Physical description" means the items required to be indicated on NRC Form 541 to describe low-level radioactive waste.*

Sec. 10. *"Principal activities" means the activities authorized by a license which are essential to achieving the purpose for which the license was issued or amended. The term does not include:*

1. Storage during which no licensed material is accessed for use; or

2. Disposal and activities incidental to decontamination or decommissioning.

Sec. 11. *"Residual waste" means low-level radioactive waste resulting from processing or decontamination that cannot be easily separated into distinct batches attributable to individual waste generators.*

Sec. 12. *"Shipper" means an entity, including, without limitation, a waste collector, waste generator or waste processor, that offers low-level radioactive waste for transportation by consigning the waste to a different waste collector or waste processor, or to a land disposal facility.*

Sec. 13. *"Uniform manifest" means the combination of NRC Forms 540, 541 and 542, and continuation sheets, as applicable.*

Sec. 14. *"Waste collector" means an entity that operates pursuant to a license issued by the Nuclear Regulatory Commission or an agreement state whose principal purpose is to:*

1. Collect and consolidate waste generated by others; and

2. Transfer this waste without processing or repackaging the waste to another waste collector, waste processor or land disposal facility.

Sec. 15. *"Waste generator" means:*

1. An entity that operates pursuant to a license issued by the Nuclear Regulatory Commission or an agreement state that:

(a) Possesses any material or component that contains radioactivity or is radioactively contaminated for which the licensee foresees no further use; and

(b) Transfers this material or component to a land disposal facility, waste collector or waste processor for handling or treatment before disposal; or

2. An entity that operates pursuant to a license issued by the Nuclear Regulatory Commission or an agreement state that transfers residual waste from its facility to a land disposal facility, waste collector or waste processor for handling or treatment before disposal.

Sec. 16. *"Waste processor" means an entity that operates pursuant to a license issued by the Nuclear Regulatory Commission or an agreement state whose principal purpose is to process, repackage or otherwise treat low-level radioactive material or waste generated by others before the waste is transferred to a licensed land disposal facility.*

Sec. 17. *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.*

Sec. 18. *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.

Sec. 19. *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 section 25 of this regulation.

3. A person may prepare unsealed radioactive material for medical use under the supervision of:

(a) An authorized user as set forth in section 25 of this regulation; or

(b) An authorized nuclear pharmacist as set forth in section 26 of this regulation.

Sec. 20. *1. An application for a license for medical use of radioactive material must be made by submitting an original and one copy of NRC Form 5 to the division. NRC Form 5 and its instructions may be obtained at no charge from the division.*

2. An application for amendment to a license or renewal of a license for medical use of radioactive material must be made by submitting an original and one copy of a letter of request to the division.

Sec. 21. *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 the effective date of this regulation; 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 the effective date of this regulation; or

(b) By an agreement state.

Sec. 22. *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 the effective date of this regulation; or

(b) By an agreement state.

Sec. 23. *1. A licensee may use the following sealed sources for diagnosis in accordance with the radiation safety and handling instructions of the manufacturer:*

(a) Iodine-125, americium-241 and gadolinium-153 in a device for bone mineral analysis; and

(b) Iodine-125 in a portable imaging device.

2. A licensee who uses radioactive material as a sealed source for diagnosis shall have in his possession a portable radiation detection survey instrument capable of:

(a) Detecting dose rates that range from 0.1 millirem per hour to 100 millirem per hour; or

(b) Measuring dose rates that range from 1 millirem per hour to 1000 millirem per hour.

Sec. 24. *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 the effective date of this regulation; 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 the effective date of this regulation.

Sec. 25. *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 sections 2 to 30, inclusive, of this regulation; 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 sections 2 to 30, inclusive, of this regulation; 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.

Sec. 26. *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 sections 2 to 30, inclusive, of this regulation; 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.

Sec. 27. *A licensee who employs an:*

1. Authorized user who supervises a person pursuant to section 25 of this regulation 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 section 26 of this regulation 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.

Sec. 28. *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 section 23 of this regulation 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 section 23 of this regulation 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.

Sec. 29. *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.

Sec. 30. *1. A waste generator, waste collector or waste processor who transports or offers for transportation low-level radioactive waste intended for ultimate disposal at a licensed land disposal facility for low-level radioactive waste must, except as otherwise provided in subsection 2, prepare a manifest that includes the information requested on NRC Forms 540, 540A, 541 and 542, as applicable. NRC Forms 540 and 540A must be completed by the waste generator, waste collector or waste processor and must accompany the shipment.*

Upon agreement between the waste generator, waste collector or waste processor and the consignee, NRC Forms 541, 541A, 542 and 542A may be completed, transmitted and stored in electronic media with the capability of producing legible, accurate and complete records of the forms in the format of a uniform manifest.

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

(a) Low-level waste for processing and expects return of the waste before it is disposed of at a licensed land disposal facility;

(b) Low-level waste that is being returned to the licensee who is the waste generator or waste processor; or

(c) Material that is contaminated with radioactivity to a waste processor and the waste becomes the residual waste of the waste processor.

3. A licensee who ships the radioactive waste shall provide the following information on the uniform manifest for each disposal container in the shipment:

(a) The name, address and telephone number of the licensee shipping the waste;

(b) A declaration of whether the licensee is acting as a waste generator, waste collector, waste processor or any combination thereof for the shipment;

(c) The name, address, telephone number and Environmental Protection Agency identification number of the carrier transporting the waste;

(d) The date of the shipment;

(e) The total number of packages and containers;

(f) The total volume and weight of the shipment;

(g) The total radionuclide activity in the shipment;

(h) The activity of each of the radionuclides contained in the shipment, including, without limitation, the activity of any H-3, C-14, Tc-99 and I-129 contained in the shipment;

(i) The total masses of U-233, U-235 and plutonium in the material shipped;

(j) The total mass of uranium and thorium in the material shipped;

(k) The alphabetic or numeric identification that uniquely identifies each disposal container in the shipment;

(l) A physical description of the disposal container, including, without limitation, the name of the manufacturer and model of any high integrity container;

(m) The volume displaced by the disposal container;

(n) The gross weight of the disposal container and the waste contained therein; (o) For waste consigned to a disposal facility, the maximum radiation level at the surface of each disposal container;

(p) A physical and chemical description of the waste;

(q) The total percentage by weight of the chelating agent for any waste containing more than 0.1 percent by weight of a chelating agent and the name of the principal chelating agent;

(r) The approximate volume of waste within the container;

(s) The sorbing media or solidification media, if any, and the identity of the vendor and name of the brand of any solidification media;

(t) For discrete waste, including, without limitation, activated materials, contaminated equipment, mechanical filters, sealed sources and devices and wastes in solidification media or stabilization media, the identities and activities of individual radionuclides associated with or contained in the waste;

(u) The total radioactivity within each container;

(v) For waste that is consigned to a disposal facility, the classification of the waste as set forth in NAC 459.8265; and

(w) The name of any waste that does not meet the structural stability requirements as set forth in NAC 459.8305.

4. A licensee who ships radioactive waste that is delivered without a disposal container must provide the following information on the manifest:

(a) The approximate volume and weight of the waste;

(b) A physical and chemical description of the waste;

(c) The total percentage by weight of the chelating agent for any waste containing more than 0.1 percent by weight of a chelating agent and the name of the principal chelating agent;

(d) For waste that is consigned to a disposal facility:

(1) The classification of the waste as set forth in NAC 459.8265; and

(2) The maximum radiation levels at the surface of the waste;

(e) The name of any waste that does not meet the structural stability requirements as set forth in NAC 459.8305; and

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

5. A licensee who ships disposal containers of mixtures of waste originating from different waste generators or mixtures of waste shipped without a container for which portions of the mixture within the shipment originate from different waste generators shall provide the following information on the manifest:

(a) For homogeneous mixtures of waste, including, without limitation, ash from an incinerator, the waste description applicable to the mixture and the volume of the waste attributed to each waste generator.

(b) For heterogeneous mixtures of waste, including, without limitation, the combined products from a large compactor, the identification of each waste generator contributing waste to the disposal container.

(c) For discrete waste, including, without limitation, activated materials, contaminated equipment, mechanical filters, sealed sources and devices and wastes in solidification media or stabilization media, the identities and activities of individual radionuclides contained in the waste.

(d) For each waste generator:

(1) The volume of waste within the disposal container;

(2) A physical and chemical description of the waste, including, without limitation, the solidification media, if any;

(3) The total percentage by weight of the chelating agent for any disposal container containing more than 0.1 percent by weight of a chelating agent and the name of the principal chelating agent;

(4) The sorbing media or solidification media, if any, and the identity of the vendor and name of the brand of any solidification media if the media is claimed to meet stability requirements as set forth in NAC 459.8305; and

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

6. A licensee who ships radioactive waste shall ensure that an authorized representative certifies, by signing and dating the shipment manifest, that the materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the United States Department of Transportation and the division. By signing the certification, a waste collector certifies that the collected waste has not been tampered with in any manner that would invalidate the certification of the authorized representative of the licensee.

7. A licensee who ships radioactive waste shall provide on the required Environmental Protection Agency forms any information regarding hazardous, medical or other waste that is required to comply with Environmental Protection Agency regulations, as codified in 40 C.F.R. Parts 259, 260 and 261, inclusive, as those provisions existed on the effective date of this regulation. The required Environmental Protection Agency forms must accompany the uniform manifest required by this section.

8. Copies of the manifests required by this section may be legible carbon copies, photocopies or computer printouts that reproduce the data in the format of the uniform manifest. NRC Forms 540, 540A, 541, 541A, 542 and 542A and their instructions may be obtained at no charge from the Information and Records Management Branch, Office of Information Resources Management, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, telephone (301) 415-7232.

9. As used in this section:

(a) "EPA identification number" means the number received pursuant to 40 C.F.R. Part 263, as those provisions existed on the effective date of this regulation.

(b) "High integrity container" means a container used to meet the structural stability requirements of NAC 459.830 and the United States Department of Transportation requirements for shipping a package that contains a type A quantity of radioactive waste.

(c) "Waste description" means the physical, chemical and radiological description of the waste that is required on NRC Form 541.

Sec. 31. NAC 459.010 is hereby amended to read as follows:

459.010 As used in NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation,* unless the context otherwise requires, the words and terms defined in NAC 459.012 to 459.1165, inclusive, *and sections 2 to 16, inclusive, of this regulation,* have the meanings ascribed to them in those sections.

Sec. 32. NAC 459.0208 is hereby amended to read as follows:

459.0208 "Authorized user" means a **[**physician who is identified as an authorized user on a license issued by the State of Nevada, the Nuclear Regulatory Commission or an agreement state that authorizes the use of radioactive materials in medical procedures.**]** *person who meets the requirements set forth in section 28 of this regulation or NAC 459.3944 to 459.3966, inclusive, as applicable.*

Sec. 33. NAC 459.048 is hereby amended to read as follows:

459.048 "License" means a license issued by the division in accordance with the provisions of NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* and chapter 459 of NRS.

Sec. 34. NAC 459.050 is hereby amended to read as follows:

459.050 "Licensee" means any person who is licensed by the division in accordance with the provisions of NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* and chapter 459 of NRS.

Sec. 35. NAC 459.051 is hereby amended to read as follows:

459.051 "Member of the public" means **[**a person in an unrestricted area. The term does not include a person**]** *any natural person except* during any period in which that *natural* person receives an occupational dose.

Sec. 36. NAC 459.0514 is hereby amended to read as follows:

459.0514 "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 **[**patient**]** *natural person* other than the **[**patient**]** *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 **[**patient**]** *natural person* other than the **[**patient**]** *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 **[**patient**]** *natural person* other than the **[**patient**]** *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 **[**patient**]** *natural person* other than the **[**patient**]** *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 **[**patient**]** *natural person* other than the **[**patient**]** *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 patient**]** *the natural person* exceeds 5 rems, or the dose equivalent to any organ exceeds 50 rems, and:

(a) The administration is:

(1) To a **[**patient**]** *natural person* other than the **[**patient**]** *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.

Sec. 37. NAC 459.054 is hereby amended to read as follows:

459.054 "Occupational dose" means the dose received by a *natural* person **[**:

1. In a restricted area; or

2. In**]** *in* the course of employment in which the *natural* person's duties involve exposure to radiation **[**and to**]** *or* radioactive material from licensed and unlicensed sources of radiation, whether in the possession of a licensee or registrant or any other person. *The term does not include a dose received by a natural person from background radiation, any medical administration of radiation, voluntary participation in medical research or as a member of the public.*

Sec. 38. NAC 459.065 is hereby amended to read as follows:

459.065 "Public dose" means the dose received by a member of the public from radiation or radioactive material that is released by a licensee, or from another source of radiation **[**within an unrestricted area**]** *under the control* of a licensee or registrant. *The term does not include a dose received by a natural person from background radiation, any medical administration of radiation or voluntary participation in medical research.*

Sec. 39. NAC 459.080 is hereby amended to read as follows:

459.080 "Registrant" means any person who is registered with the division and who is legally obligated to register with the division pursuant to NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* and chapter 459 of NRS.

Sec. 40. NAC 459.082 is hereby amended to read as follows:

459.082 "Registration" means registration with the division in accordance with the provisions of NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* and chapter 459 of NRS.

Sec. 41. NAC 459.1165 is hereby amended to read as follows:

459.1165 "Written directive" means a written order for the administration of a radiopharmaceutical or radiation to a specific patient **[**, which:

1.**]** *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.

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

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

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

[5.**]** *(e)* For the administration of radiation during **[**:

(a) Brachytherapy**]** *brachytherapy* by remote afterloading at a high dose rate, contains the radioisotope, site of treatment **[**,**]** and total dose prescribed.

[(b) Any other brachytherapy, contains:

(1)**]** *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.

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

[(I)**]** *(1)* The total source strength and time of exposure prescribed; or

[(II)**]** *(2)* The total dose prescribed.

Sec. 42. NAC 459.118 is hereby amended to read as follows:

459.118 NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* apply to all persons who receive, possess, use, transfer, own or acquire any source of radiation except as otherwise specifically provided in these regulations. Nothing in these regulations applies to any person to the extent he is subject to regulation by the Nuclear Regulatory Commission.

Sec. 43. NAC 459.120 is hereby amended to read as follows:

459.120 1. The division **[**will,**]** *may,* upon application or its own initiative, grant exemptions or exceptions from the requirements of **[**these regulations**]** *NAC 459.010 to 459.950, inclusive, and sections 2 to 30, inclusive, of this regulation,* as it determines will not result in undue hazard to public health and safety or property.

2. Common and contract carriers, freight forwarders **[**,**]** and warehousemen **[**,**]** who are subject to the regulations of the *United States* Department of Transportation or the *United States* Postal Service (39 C.F.R. Parts 14 **[**&**]** *and* 15), are exempt from NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* to the extent that they transport or store sources of radiation in the regular course of their carriage for another or store the sources as an incident to such transportation. Private carriers who are subject to the

regulations of the *United States* Department of Transportation are exempt from NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* to the extent that they transport sources of radiation. Common, contract and private carriers who are not subject to the regulations of the *United States* Department of Transportation or the *United States* Postal Service are subject to applicable sections of NAC 459.010 to 459.950, inclusive **[**.**]** *, and sections 2 to 30, inclusive, of this regulation.*

3. Any contractor or subcontractor of the *United States* Department of Energy or the Nuclear Regulatory Commission who is in one of the following categories and operating within **[**Nevada**]** *this state* is exempt from NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* to the extent that, under his contract, he receives, possesses, uses, transfers or acquires sources of radiation:

(a) Any prime contractor performing work for the *United States* Department of Energy at sites owned or controlled by the United States Government, transporting sources of radiation to or from such sites, or performing contract services during temporary interruptions of such transportation.

(b) Any prime contractor of the *United States* Department of Energy performing research in, or development, manufacture, storage, testing or transportation of **[**,**]** atomic weapons or components thereof.

(c) Any prime contractor of the *United States* Department of Energy using or operating a nuclear reactor or other nuclear device in a vehicle or vessel owned by the United States Government.

(d) Any other prime contractor or subcontractor of the *United States* Department of Energy or of the Nuclear Regulatory Commission when the state and the Nuclear Regulatory Commission jointly determine that:

(1) The exemption of the prime contractor or subcontractor is authorized by law; and

(2) Under the terms of the contract or subcontract there is adequate assurance that the work thereunder can be accomplished without undue risk to public health or safety.

Sec. 44. NAC 459.124 is hereby amended to read as follows:

459.124 In addition to other records required by NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation,* each licensee and registrant shall maintain records showing his receipt, transfer and disposal of all sources of radiation.

Sec. 45. NAC 459.134 is hereby amended to read as follows:

459.134 All communications and reports concerning the provisions of NAC 459.010 to 459.950, inclusive, and *sections 2 to 30, inclusive, of this regulation, copies of regulatory guides and* applications filed under those provisions should be addressed to the Radiological Health Section, Health Division, 505 East King Street, Carson City, Nevada **[**89710.**]** *89701.*

Sec. 46. NAC 459.138 is hereby amended to read as follows:

459.138 No licensee or registrant may change the method observed by him for determining calendar quarters for purposes of NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation,* except at the beginning of a calendar year.

Sec. 47. NAC 459.142 is hereby amended to read as follows:

459.142 If any of the provisions of NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation,* or any application thereof to any person, thing **[**,**]** or circumstance is held invalid, it is intended that such invalidity not affect the remaining

provisions, or their application, that can be given effect without the invalid provision or application.

Sec. 48. NAC 459.154 is hereby amended to read as follows:

459.154 1. Except as otherwise provided in subsection 2, each person who controls an unregistered, operational radiation machine shall apply to the division for registration of the machine within 30 days after installing the machine.

2. A person who brings a portable machine into this state for a temporary use of 180 days or less in any calendar year:

(a) Must apply to the division for registration of the machine for a temporary use at least 3 working days before using it in this state;

(b) Shall comply with all other applicable provisions of NAC 459.010 to 459.950, inclusive **[**;**]** *, and sections 2 to 30, inclusive, of this regulation;*

(c) Shall furnish the division with any other information it may reasonably request; and

(d) Shall not use the machine in this state more than 180 days per calendar year.

3. The application must be made on the division's Form NRC-4, Application for Registration of Radiation Machine. A copy of the form may be obtained from the division. A separate application and registration are required for each control console of a radiation machine.

4. Each application for registration of an X-ray machine must contain a list of the numbers of the X-ray tubes associated with a control panel.

5. Each person who controls a radiation machine must designate on the application form a person where the machine is located who is responsible for protection against radiation.

6. Each person who seeks to engage in the business of installing radiation machines, furnishing services or repairing radiation machines in **[**Nevada**]** *this state* must apply for registration with the division and receive a certificate of registration before furnishing any services.

7. Each application for registration by a person to install, service or repair radiation machines must be accompanied by a nonrefundable annual fee of $45 or the application **[**will**]** *must* not be acted upon by the division.

Sec. 49. NAC 459.166 is hereby amended to read as follows:

459.166 1. Any person who sells, leases, transfers, lends, disposes, assembles or installs radiation machines in **[**Nevada**]** *this state* or sells, leases, transfers or disposes of a radiation machine currently registered in this state shall, within 15 days, notify the division of:

(a) The name and address of each person who has received such a machine;

(b) The manufacturer, model and serial number of each control console and X-ray tube transferred; and

(c) The date of transfer of each machine.

2. A person shall not make, sell, lease, transfer, lend, assemble or install any radiation machine or the supplies and equipment used in connection with such a machine unless the machine and any supplies and equipment, when properly placed in operation and used, meet the applicable requirements of NAC 459.010 to 459.950, inclusive **[**.**]** *, and sections 2 to 30, inclusive, of this regulation.*

Sec. 50. NAC 459.180 is hereby amended to read as follows:

459.180 1. NAC 459.180 to 459.314, inclusive, *and sections 17 to 23, inclusive, of this regulation* provide for the licensing of radioactive materials. No person may receive, possess,

use, transfer, own **[**,**]** or acquire radioactive material except as authorized in a specific or general license issued pursuant to NAC 459.180 to 459.314, inclusive, *and sections 17 to 23, inclusive, of this regulation,* or as otherwise provided in those sections.

2. In addition to the requirements of NAC 459.180 to 459.314, inclusive, *and sections 17 to 23, inclusive, of this regulation,* all licensees are subject to the requirements of NAC 459.010 to 459.142, inclusive, *sections 2 to 16, inclusive, of this regulation,* 459.320 to 459.374, inclusive, and 459.780 to 459.794, inclusive. Licensees engaged in industrial radiographic operations are subject to the requirements of NAC 459.680 to 459.736, inclusive, and licensees using radioactive materials in the healing arts are subject to the requirements of NAC 459.3801 to 459.3966, inclusive **[**.**]** *, and sections 24 to 29, inclusive, of this regulation.*

Sec. 51. NAC 459.182 is hereby amended to read as follows:

459.182 1. Any person is exempt from NAC 459.180 to 459.314, inclusive, *and sections 17 to 23, inclusive, of this regulation* to the extent that he receives, possesses, uses, owns or transfers source material in any chemical mixture, compound, solution or alloy in which the source material is by weight less than 0.05 percent of the mixture, compound, solution or alloy.

2. Any person is exempt from NAC 459.180 to 459.314, inclusive, *and sections 17 to 23, inclusive, of this regulation* to the extent that he receives, possesses, uses or transfers unrefined and unprocessed ore containing source material. Except as authorized in a specific license, such a person may not refine or process such ore.

3. Any person is exempt from NAC 459.180 to 459.314, inclusive, *and sections 17 to 23, inclusive, of this regulation* to the extent that he receives, possesses, uses or transfers any of the following:

(a) Any quantities of thorium contained in:

(1) Incandescent gas mantles;

(2) Vacuum tubes;

(3) Welding rods;

(4) Electric lamps for illuminating purposes if each lamp does not contain more than 50 milligrams of thorium;

(5) Germicidal lamps, sunlamps and lamps for outdoor or industrial lighting, if each lamp does not contain more than 2 grams of thorium;

(6) Rare earth metals and compounds, mixtures and products containing not more than 0.25 percent by weight thorium, uranium or any combination of these; or

(7) Personnel neutron dosimeters if each dosimeter does not contain more than 50 milligrams of thorium.

(b) Source material contained in the following products:

(1) Glazed ceramic tableware, if the glaze contains not more than 20 percent by weight source material;

(2) Glassware containing not more than 10 percent by weight source material, but not including commercially manufactured glass brick, pane glass, ceramic tile or other glass, glass enamel or ceramic used in construction; or

(3) Piezoelectric ceramic containing not more than 2 percent by weight source material.

(c) Photographic film, negatives and prints containing uranium or thorium.

(d) Any finished product or part which is fabricated of or contains tungsten-thorium or magnesium-thorium alloys if the thorium content of the alloy does not exceed 4 percent by

weight. This exemption does not authorize the chemical, physical, or metallurgical treatment or processing of any such product or part.

(e) Uranium contained in counterweights installed in aircraft, rockets, projectiles and missiles, or stored or handled in connection with installation or removal of counterweights if:

(1) The counterweights are manufactured in accordance with a specific license issued by the Nuclear Regulatory Commission authorizing distribution by the licensee pursuant to 10 C.F.R. Part 40;

(2) Each counterweight has been impressed with the following legend clearly legible through the plating or other covering: "DEPLETED URANIUM";

(3) Each counterweight is durably and legibly labeled or marked with the identification of the manufacturer and the statement: "UNAUTHORIZED ALTERATIONS PROHIBITED";

(4) The exemption contained in this subsection (e) does not authorize the chemical, physical or metallurgical treatment or processing of any such counterweights other than repair or restoration of any plating or other covering; and

(5) The requirements specified in subparagraphs (2) and (3) above need not be met by counterweights manufactured **[**prior to**]** *before* December 31, 1969, provided that such counterweights are impressed with the legend, "CAUTION - RADIOACTIVE MATERIAL - URANIUM," as previously required by the regulations of the board **[**prior to**]** *before* February 28, 1980.

(f) Natural or depleted uranium metal used as shielding in any shipping container, if:

(1) The shipping container is conspicuously and legibly impressed with the legend "CAUTION - RADIOACTIVE SHIELDING - URANIUM"; and

(2) The uranium metal is encased in mild steel or an equally fire resistant metal with a wall thickness of one-eighth of an inch.

(g) Thorium contained in finished optical lenses, if each lens does not contain more than 30 percent by weight of thorium. The exemption contained in this paragraph does not authorize either:

(1) The shaping, grinding or polishing of such lenses or manufacturing processes other than the assembly of such lenses into optical systems and devices without any alteration of the lenses; or

(2) The receipt, possession, use or transfer of thorium contained in contact lenses, in spectacles, or in eyepieces in binoculars or other optical instruments.

(h) Uranium contained in detector heads for use in fire detection units if each detector head contains not more than 0.005 microcurie of uranium.

(i) Thorium contained in any finished aircraft engine part containing nickel-thoria alloy, if:

(1) The thorium is dispersed in the nickel-thoria alloy in the form of finely divided thoria (thorium dioxide); and

(2) The thorium content in the nickel-thoria alloy does not exceed 4 percent by weight.

4. The exemptions in subsection 3 do not authorize the manufacture of any of the products described.

Sec. 52. NAC 459.184 is hereby amended to read as follows:

459.184 1. Except as provided in subsection 2, any person is exempt from NAC 459.180 to 459.314, inclusive, *and sections 17 to 23, inclusive, of this regulation* to the extent that he receives, possesses, uses, transfers, owns or acquires products or materials containing radioactive material in concentrations not in excess of those listed in NAC 459.186.

2. A person may not introduce radioactive material into a product or material knowing or having reason to believe that it will be transferred to persons exempt under subsection 1 or *the* equivalent regulations of the Nuclear Regulatory Commission **[**,**]** or any agreement state, except in accordance with a specific license issued pursuant to NAC 459.276 or the general licenses provided in NAC 459.210.

3. Except as provided in subsections 4 and 5, any person is exempt from the provisions of NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation,* to the extent that he receives, possesses, uses, transfers, owns or acquires radioactive material in individual quantities each of which does not exceed the applicable quantity set forth in NAC 459.188.

4. *The provisions of* NAC 459.180 to 459.314, inclusive, **[**does**]** *and sections 17 to 23, inclusive, of this regulation do* not authorize the production, packaging or repackaging of radioactive material for purposes of commercial distribution or the incorporation of radioactive material into products intended for commercial distribution.

5. No person may, for purposes of commercial distribution, transfer radioactive material in the individual quantities in NAC 459.188, knowing or having reason to believe that such quantities of radioactive material will be transferred to persons exempt under subsections 3 and 4 or *the* equivalent regulations of the Nuclear Regulatory Commission or any agreement state, except in accordance with a specific license issued by the Nuclear Regulatory Commission pursuant to 10 C.F.R. § 32.18 or by the division pursuant to NAC 459.278. The license must state that the radioactive material may be transferred by the licensee to persons exempt under subsections 3 and 4 or the equivalent regulations of the Nuclear Regulatory Commission or any agreement state.

Sec. 53. NAC 459.186 is hereby amended to read as follows:

459.186 Exempt concentrations are:

Element (atomic number)	Isotope	Column I Gas concentration µCi/ml[1]	Column II Liquid and solid concentration µCi/ml[2]
Antimony (51)	Sb 122		3×10^{-4}
	Sb 124		2×10^{-4}
	Sb 125		1×10^{-3}
Argon (18)	Ar 37	1×10^{-3}	
	Ar 41	4×10^{-7}	
Arsenic (33)	As 73		5×10^{-3}
	As 74		5×10^{-4}
	As 76		2×10^{-4}
	As 77		8×10^{-4}
Barium (56)	Ba 131		2×10^{-3}
	Ba 140		3×10^{-4}
Beryllium (4)	Be 7		2×10^{-2}
Bismuth (83)	Bi 206		4×10^{-4}
Bromine (35)	Br 82	4×10^{-7}	3×10^{-3}
Cadmium (48)	Cd 109		2×10^{-3}
	Cd 115m		3×10^{-4}
	Cd 115		3×10^{-4}
Calcium (20)	Ca 45		9×10^{-5}
	Ca 47		5×10^{-4}
Carbon (6)	C 14	1×10^{-6}	8×10^{-3}
Cerium (58)	Ce 141		9×10^{-4}
	Ce 143		4×10^{-4}
	Ce 144		1×10^{-4}

Cesium (55)	Cs 131		2×10^{-2}
	Cs 134m		6×10^{-2}
	Cs 134		9×10^{-5}
Chlorine (17)	Cl 38	9×10^{-7}	4×10^{-3}
Chromium (24)	Cr 51		2×10^{-2}
Cobalt (27)	Co 57		5×10^{-3}
	Co 58		1×10^{-3}
	Co 60		5×10^{-4}
Copper (29)	Cu 64		3×10^{-3}
Dysprosium (66)	Dy 165		4×10^{-3}
	Dy 166		4×10^{-4}
Erbium (68)	Er 169		9×10^{-4}
	Er 171		1×10^{-3}
Europium (63)	Eu 152		6×10^{-4}
	(Tr=9.2 h)		
	Eu 155		2×10^{-3}
Fluorine (9)	F 18	2×10^{-6}	8×10^{-3}
Gadolinium (64)	Gd 153		2×10^{-3}
	Gd 159		8×10^{-4}
Gallium (31)	Ga 72		4×10^{-4}
Germanium (32)	Ge 71		2×10^{-2}

Gold (79)	Au 196		2×10^{-3}
	Au 198		5×10^{-4}
	Au 199		2×10^{-3}
Hafnium (72)	Hf 181		7×10^{-4}
Hydrogen (1)	H 3	5×10^{-6}	3×10^{-2}
Indium (49)	In 113m		1×10^{-2}
	In 114m		2×10^{-4}
Iodine (53)	I 126	3×10^{-9}	2×10^{-5}
	I 131	3×10^{-9}	2×10^{-5}
	I 132	8×10^{-8}	6×10^{-4}
	I 133	1×10^{-8}	7×10^{-5}
	I 134	2×10^{-7}	1×10^{-3}
[Iradium**]**			
Iridium (77)	Ir 190		2×10^{-3}
	Ir 192		4×10^{-4}
	Ir 194		3×10^{-4}
Iron (26)	Fe 55		8×10^{-3}
	Fe 59		6×10^{-4}
Krypton (36)	Kr 85m	1×10^{-6}	
	Kr 85	3×10^{-6}	
Lanthanum (57)	La 140		2×10^{-4}
Lead (82)	Pb 203		4×10^{-3}
Lutetium (71)	Lu 177		1×10^{-3}
Manganese (25)	Mn 52		3×10^{-4}
	Mn 54		1×10^{-3}
	Mn 56		1×10^{-3}

Mercury (80)	Hg 197m	2×10^{-3}	Rhenium (75)	Re 183	6×10^{-3}
	Hg 197	3×10^{-3}		Re 186	9×10^{-4}
	Hg 203	2×10^{-4}		Re 188	6×10^{-4}
Molybdenum (42)	Mo 99	2×10^{-3}	Rhodium (45)	Rh 103m	1×10^{-1}
Neodymium (60)	Nd 147	6×10^{-4}		Rh 105	1×10^{-3}
	Nd 149	3×10^{-3}	Rubidium (37)	Rb 86	7×10^{-4}
Nickel (28)	Ni 65	1×10^{-3}	Ruthenium (44)	Ru 97	4×10^{-3}
Niobium				Ru 103	8×10^{-4}
(Columbium) (41)	Nb 95	1×10^{-3}		Ru 105	1×10^{-3}
	Nb 97	9×10^{-3}		Ru 106	1×10^{-4}
Osmium (76)	Os 185	7×10^{-4}	Samarium (62)	Sm 153	8×10^{-4}
	Os 191m	3×10^{-2}	Scandium (21)	Sc 46	4×10^{-4}
	Os 191	2×10^{-3}		Sc 47	9×10^{-4}
	Os 193	6×10^{-4}		Sc 48	3×10^{-4}
Palladium (46)	Pd 103	3×10^{-3}	Selenium (34)	Se 75	3×10^{-3}
	Pd 109	9×10^{-4}	Silicon (14)	Si 31	9×10^{-3}
Phosphorus (15)	P 32	2×10^{-4}	Silver (47)	Ag 105	1×10^{-3}
Platinum (78)	Pt 191	1×10^{-3}		Ag 110m	3×10^{-4}
	Pt 193m	1×10^{-2}		Ag 111	4×10^{-4}
	Pt 197m	1×10^{-2}	Sodium (11)	Na 24	2×10^{-3}
	Pt 197	1×10^{-3}	Strontium (38)	Sr 85	1×10^{-3}
Potassium (19)	K 42	3×10^{-3}		Sr 89	1×10^{-4}
Praseodymium (59)	Pr 142	3×10^{-4}		Sr 91	7×10^{-4}
	Pr 143	5×10^{-4}		Sr 92	7×10^{-4}
Promethium (61)	Pm 147	2×10^{-3}	Sulfur (16)	S 35 9×10^{-8}	6×10^{-4}
	Pm 149	4×10^{-4}	Tantalum (73)	Ta 182	4×10^{-4}

Technetium (43)	Tc 96m	1×10^{-1}	Vanadium (23)	V 48		3×10^{-4}
	Tc 96	1×10^{-3}	Xenon (54)	Xe 131m	4×10^{-6}	
Tellurium (52)	Te 125m	2×10^{-3}		Xe 133	3×10^{-6}	
	Te 127m	6×10^{-4}		Xe 135	1×10^{-6}	
	Te 127	3×10^{-3}	Ytterbium (70)	Yb 175		1×10^{-3}
	Te 129m	3×10^{-4}	Yttrium (39)	Y 90		2×10^{-4}
	Te 131m	6×10^{-4}		Y 91m		3×10^{-2}
	Te 132	3×10^{-4}		Y 91		3×10^{-4}
Terbium (65)	Tb 160	4×10^{-4}		Y 92		6×10^{-4}
Thallium (81)	Tl 200	4×10^{-3}		Y 93		3×10^{-4}
	Tl 201	3×10^{-3}	Zinc (30)	Zn 65		1×10^{-3}
	Tl 202	1×10^{-3}		Zn 69m		7×10^{-4}
	Tl 204	1×10^{-3}		Zn 69		2×10^{-2}
Thulium (69)	Tm 170	5×10^{-4}	Zirconium (40)	Zr 95		6×10^{-4}
	Tm 171	5×10^{-3}		Zr 97		2×10^{-4}
Tin (50)	Sn 113	9×10^{-4}	Beta, gamma, or both,			
	Sn 125	2×10^{-4}	emitting radioactive			
Tungsten			material not listed			
(Wolfram) (74)	W 181	4×10^{-3}	above with a half-			
	W 187	7×10^{-4}	life of less than 3			
			years.		1×10^{-10}	1×10^{-6}

[1] Values are given in Column I only for those materials normally used as gases.

[2] μCi/gm for solids.

m Metastable state.

Concentration present in the product and the exempt concentration established in this section for the specific isotope when not in combination. The sum of such ratios may not exceed "1," that is, unity. An example is:

$$\frac{\text{Concentration of Isotope A in Product}}{\text{Exempt concentration of Isotope A}} + \frac{\text{Concentration of Isotope B in Product}}{\text{Exempt concentration of Isotope B}} \leq 1$$

Note 1: Many radioisotopes disintegrate into isotopes which are also radioactive. In expressing the concentrations in the table the activity stated is that of the parent isotope and takes into account the daughters.

Note 2: For the purposes of NAC 459.184 where there is involved a combination of isotopes, the limit for the combination should be derived as follows: Determine for each

isotope in the product the ratio between the concentration present in the product and the exempt concentration.

Sec. 54. NAC 459.190 is hereby amended to read as follows:

459.190 1. Except for persons who apply radioactive material to, or persons who incorporate radioactive material into the following products, any person is exempt from **[**these regulations**]** *NAC 459.010 to 459.950, inclusive, and sections 2 to 30, inclusive, of this regulation* to the extent that he receives, possesses, uses, transfers, owns or acquires the following products:

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

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

(2) Five millicuries of tritium per hand.

(3) Fifteen millicuries of tritium per dial; if bezels are used they are considered part of the dial.

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

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

(6) Sixty microcuries of promethium 147 per watch dial or 120 microcuries of promethium 147 per other timepiece dial; if bezels are used they are considered part of the dial.

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

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

(9) Nine-hundredths microcurie 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 per hour at 10 centimeters from any surface;

(II) For pocket watches, 0.1 millirad 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 per hour at 10 centimeters from any surface.

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

(b) Lock illuminators containing not more than 15 millicuries of tritium or not more than 2 millicuries of promethium 147 installed in automobile locks. The levels of radiation from each lock illuminator containing promethium 147 must not exceed 1

millirad 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 of tritium per balance or 0.5 millicurie of tritium per balance part.

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

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

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

(2) One microcurie of cobalt 60;

(3) Five microcuries of nickel 63;

(4) Thirty microcuries of krypton 85;

(5) Five microcuries of cesium 137; or

(6) Thirty microcuries of promethium 147 **[**;**]** ,

and if the levels of radiation from each electron tube containing radioactive material do not exceed 1 millirad 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, *and sections 17 to 23, inclusive, of this regulation,* 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 . **[**, Washington, D. C. 20555.**]**

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. 55. NAC 459.192 is hereby amended to read as follows:

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

1. Except for persons who manufacture, process or produce self-luminous products containing tritium, krypton 85 or promethium 147, any person is exempt from the provisions of NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* to the extent that he receives, possesses, uses, transfers, owns or acquires tritium, krypton 85 or promethium 147 in self-luminous products manufactured, processed, produced, imported or transferred in accordance with a specific license issued by the Nuclear Regulatory Commission pursuant to 10 C.F.R. § 32.22 which license authorizes the transfer of the product to persons who are exempt from regulatory requirements. The exemption in this subsection for self-luminous products does not apply to tritium, krypton 85 or promethium 147 used in products for frivolous purposes or in toys or adornments.

2. Any person is exempt from the provisions of NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* to the extent that he receives, possesses, uses, transfers or owns articles containing less than 0.1 microcurie of radium 226 which were acquired before February 28, 1980.

3. Except for persons who manufacture, process or produce gas and aerosol detectors containing radioactive material, any person is exempt from the provisions of NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation,* to the extent that he receives, possesses, uses, transfers, owns or acquires radioactive material in gas and aerosol detectors designed to protect life or property from fires and airborne hazards if the detectors containing radioactive material have been manufactured, imported

or transferred in accordance with a specific license issued by the division, the Nuclear Regulatory Commission or any other agreement state pursuant to 10 C.F.R. § 32.26 or its equivalent, which authorizes the transfer of the detectors to persons who are exempt from regulatory requirements. The following also applies to gas and aerosol detectors containing radioactive material:

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

(b) Any gas and aerosol detector 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 synthetic plastic resins containing scandium 46 which are designed for sand consolidation in oil wells is exempt from the provisions of NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* if the resins have been manufactured or imported in accordance with a specific license issued by the Nuclear Regulatory Commission or have been manufactured in accordance with the specifications contained in a specific license issued by the division or any agreement state to the manufacturer of resins pursuant to licensing requirements equivalent to those in 10 C.F.R. §§ 32.16 **[**&**]** *and* 32.17 of the regulations of the Nuclear Regulatory Commission. This exemption does not authorize the manufacture of any resins containing scandium 46.

Sec. 56. NAC 459.1955 is hereby amended to read as follows:

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

(a) Unsealed radioactive materials *with a half-life of more than 120 days* in quantities **[**equal or exceeding the following quantities shall submit a decommissioning plan and a plan for financing the decommissioning:

(a) Quantity of radioactive material in unsealed form with a half-life greater than 120 days exceeding 10^3 times and for sealed forms exceeding 10^{10} times the applicable quantity set forth for one isotope in NAC 459.362. Or in the case where a combination of isotopes is involved, when R divided by 10^3 or 10^{10}, as appropriate, is greater than 1. As used in this paragraph, R means the sum of the ratios of the quantity of each isotope to the applicable value set forth in NAC 459.362.

(b) Quantity of source material in readily dispersible form exceeding 10 millicuries.

2. The decommissioning plan must include the following:

(a) Drawings of the facility where the radioactive material is located depicting the areas where the radioactive materials are used and stored.

(b) A description of methods and general procedures that will be used for decontamination of the facility, maintaining security during the process of decontamination and for performing surveys to evaluate the progress of decontamination.

(c) The time within which the process of decommissioning will commence after the use of radioactive material is terminated and the expected time within which decommissioning will be completed.

3.**]** *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 one.

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

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

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

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

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

3. If an applicant:

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

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

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

5. The holder of a specific license that is issued before the effective date of this regulation, and:

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

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

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

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

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

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

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

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

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

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

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

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

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

8. The plan for financing **[**the**]** 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 **[**4; and**]** *9;*

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

4.**]** *; and*

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

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

(a) **[**Deposit the**]** *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 **[**licensee's**]** assets *of the licensee* and *outside the* administrative control **[**. The money or liquid assets**]** *of the licensee. Prepayment* may be **[**deposited**]** in the form of a trust, escrow account, government fund, certificate of deposit or deposit of government securities.

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

guarantee and test meet the criteria set forth in subsection 12. Such a guarantee must not be used in combination with any other method of financing to satisfy the requirements of this subsection or if the applicant or licensee has a parent company that holds a majority control of the voting stock of the applicant or licensee. Any surety used to provide financial assurance for decommissioning must contain the following conditions:

(1) The surety must be open-ended or, if written for a specified term, must be renewed automatically unless 90 days or more before the renewal date, the issuer notifies the division, the beneficiary and the licensee of his intention not to renew. **[**The surety must provide notice of cancellation to the division, the beneficiary and the licensee, not less than 30 days before cancellation of the surety.**]** 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**]** *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.**]** *Federal Government.*

A licensee shall maintain the surety in effect until the division has terminated his license. **[**As used in this paragraph, "surety" means, but is not limited to a trust fund, surety bonds, letters of credit, insurance, other guarantees of performance, or any combination of these or other forms of security approved by the division.**]**

(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. **[**As used in this paragraph, "external sinking fund" means a fund established and maintained by setting aside 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 operation of the facility is expected is sufficient to pay the costs of decommissioning. An external sinking fund may be in the form of a trust, escrow account, certificate of deposit or deposit of government securities.**]**

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

10. A person licensed pursuant to NAC 459.180 to 459.314, inclusive, and sections 17 to 23, inclusive, of this regulation 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.

11. Before licensed activities are transferred or assigned pursuant to subsection 2 of NAC 459.198, the licensee must transfer all the records described in paragraphs (a),

(b) and (c) of subsection 10 to the licensee to whom the activities have been transferred or assigned. Such records must be retained until the license is terminated.

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

(a) A parent company must have:

(1) Two of the following three ratios:

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

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

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

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

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

(b) A parent company must have:

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

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

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

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

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

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

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

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

14. A licensee who guarantees the costs of decommissioning shall have:

(a) A tangible net worth of at least ten 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 ten times the cost estimate for decommissioning;

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

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

15. A licensee shall ensure that a certified public accountant who is independent of the licensee compares the data used to satisfy the financial test as set forth in subsections 12 and 14. The data must be derived from audited, year-end financial statements for the last fiscal year. A licensee shall inform the division within 90 days after matters which cause the certified public accountant to believe that the data used to satisfy the financial test should be adjusted and that the licensee or parent company, as applicable, can no longer pass the test. After the initial financial test, the licensee or parent company, as applicable, shall repeat the test within 90 days after the close of each fiscal year. If the parent company can no longer pass the test, the licensee must notify the division of its intent to establish alternate financial assurance as specified in this section. The notice must be sent by certified mail within 90 days after the close of the fiscal year. The licensee shall provide alternate financial assurance within 120 days after the close of such fiscal year.

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

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

18. As used in this section:

(a) "External sinking fund" means a fund established and maintained by depositing money periodically in an account segregated from the licensee's assets and outside the licensee's administrative control in which the total amount of money to be accumulated before the termination of the operation is expected is sufficient to pay the costs of decommissioning. The term includes, without limitation, a trust, escrow account, government fund, certificate of deposit or deposit of government securities.

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

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

Sec. 57. NAC 459.196 is hereby amended to read as follows:

459.196 1. Upon a determination that an application meets the requirements of chapter 459 of NRS and the regulations of the division, the division will issue a specific license authorizing the proposed activity in a form and containing such conditions and limitations as it deems appropriate or necessary.

2. The division may incorporate in any license at the time of issuance additional requirements and conditions with respect to the licensee's receipt, possession, use and transfer of radioactive material subject to NAC 459.180 to 459.314, inclusive, *and sections 17 to 23, inclusive, of this regulation,* as it deems appropriate or necessary in order to:

(a) Minimize danger to public health and safety or property;

(b) Require such reports and the keeping of such records, and to provide for such inspections of activities under the licenses as may be appropriate or necessary; and

(c) Prevent loss or theft of material subject to NAC 459.180 to 459.314, inclusive **[**.**]** *, and sections 17 to 23, inclusive, of this regulation.*

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

459.200 1. Except as otherwise provided in subsection [5 and in NAC 459.202, each] *2, a* specific license expires at the end of the day [, in the month and year stated in] *on the date of expiration set forth on* the license.

2. [Each licensee shall notify the division immediately in writing and request termination of his license when he terminates all activities involving radioactive materials authorized under the license. The notification and request for termination of the license must include the reports specified in paragraphs (d) and (e) of subsection 3.

3. If the licensee requests termination of the license or does not submit an application for renewal of the license as provided in NAC 459.202, he shall, on or before the expiration date specified on the license:

(a) Terminate his use of radioactive material;

(b) Remove radioactive contamination until the only radiation remaining is background radiation;

(c) Properly dispose of the radioactive material in his possession by transferring it to a person licensed to possess that specific type and quantity of radioactive material;

(d) Submit a report to the division which includes:

(1) The name, address, and telephone number of the person to whom the radioactive material was transferred; and

(2) A copy of a receipt for the radioactive material, signed by the recipient, which contains:

(I) The date the radioactive material was received;

(II) A description of the isotope and the activity for each isotope in the shipment received; and

(III) The license number of the recipient; and

(e) Submit a report of a radiation survey to the division to notify it of the absence of radioactive material or the presence and levels of residual radioactive contamination.

4. If the licensee submits in the report of the radiation survey adequate evidence that no residual radioactive material attributable to activities conducted under the license is detected on the premises, the division, after verification, will notify him that the license is terminated.

5. If, after the radiation survey, detectable levels of residual radioactive contamination attributable to activities conducted under the license are found, the license continues in effect beyond the expiration date, if necessary, with respect to the possession of residual radioactive material present as contamination, until the division notifies the licensee in writing that the license is terminated.

6. Each licensee who possesses residual radioactive material after the expiration date specified in the license shall:

(a) Submit to the division a proposed plan for completion of decommissioning the facility where the radioactive material is located. The plan must contain the following information:

(1) A description of activities planned for the decommissioning of the facility;

(2) A description of the methods that will be used to assure protection of employees of the facility and the environment against hazards involving radiation during the decommissioning of the facility;

(3) A description of an additional radiation survey to be performed after the decommissioning of the facility is completed;

(4) The proposed date of commencement of activities for the decommissioning of the facility and the expected date of completion; and

(5) An updated and detailed estimate of the cost for decommissioning the facility, a comparison of that estimate with money set aside for decommissioning the facility, and a plan for assuring the availability of adequate money for payment of the costs of completion of decommissioning the facility.

The proposed plan for completion of decommissioning the facility will be approved by the division if the information therein demonstrates that the decommissioning will be completed as soon as is reasonable and the health and safety of employees of the facility and the public will be adequately protected. Upon approval of the proposed plan for completion of decommissioning, the licensee shall complete decommissioning in accordance with the plan. After the decommissioning of the facility is completed, the licensee shall submit a report of the additional radiation survey and shall certify the disposition of wastes accumulated from the decommissioning of the facility.

(b)] *A specific license revoked by the division expires on the date of the decision of the division to revoke the license or on the date specified in the decision of the division to revoke the license.*

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

(a) Limit actions involving radioactive material to those related to [decontamination and other activities related to preparation of the premises for release for unrestricted use.

(c)] *decommissioning; and*

(b) Continue to control entry to restricted areas [on the premises] until they are suitable for release [for unrestricted use and the division notifies him in writing that the license is terminated.] *so that there is no undue hazard to public health and safety.*

4. Except as otherwise provided in subsection 6, a licensee shall notify the division in writing within 60 days before:

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

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

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

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

6. The division may grant a request to extend the period during which notification is required pursuant to subsection 4 if the division determines that such an extension is not detrimental to the public health and safety and is otherwise in the public interest. The request must be submitted not later than 30 days before notification is required pursuant to subsection 4. The schedule for decommissioning may not commence until the division has made a determination on the request.

7. A plan for decommissioning must be submitted to the division by the licensee if it is required by a condition of the license or if the procedures for decommissioning have not been approved by the division and these procedures could increase the potential

impacts on the health and safety of workers or the public, including, without limitation, if:

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

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

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

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

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

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

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

(b) A description of the decommissioning activities;

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

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

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

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

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

10. Except as otherwise provided in subsection 11, a licensee:

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

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

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

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

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

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

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

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

12. As the final step in decommissioning, the licensee shall:

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

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

(1) A description of the levels of gamma radiation in units of millisieverts (microroentgen) per hour at one meter from surfaces;

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

(I) Megabecquerels (disintegrations per minute or microcuries) per 100 square centimeters, removable and fixed, for surfaces;

(II) Megabecquerels (microcuries) per milliliter for water; and

(III) Becquerels (picocuries) per gram for solids, including, without limitation, soils and concrete; and

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

13. A specific license, including an expired license, will be terminated by written notice to the licensee that the division has determined that all radioactive material has been disposed of properly, reasonable effort has been made by the licensee to eliminate residual radioactive contamination, if present, and:

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

(b) Information submitted by the licensee is sufficient to demonstrate that the premises are suitable for release because there is not an undue hazard to public health and safety.

Sec. 59. NAC 459.202 is hereby amended to read as follows:

459.202 **[**1.**]** Applications for renewal of specific licenses must be filed in accordance with NAC 459.236 and, except as otherwise provided in NAC 459.203, must be accompanied by the appropriate fee as **[**prescribed**]** *set forth* in NAC 459.310.

[2. If a licensee, not less than 30 days before the expiration of his existing license, has filed an application in proper form for a renewal or a new license authorizing the same activities, his existing license will not expire until the application has been finally determined by the division.**]** *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. 60. NAC 459.203 is hereby amended to read as follows:

459.203 1. Except as otherwise provided in subsection 2, if the division issues a specific license pursuant to NAC 459.196, the licensee must, for each year his specific license is valid, submit to the division the appropriate fee set forth in NAC 459.310.

2. The fee must be received *each year* by the division not later than the **[**date on which the license expires.**]** *last day of the same month that is set forth as the date of expiration on the license.* If the fee is not received by that date, the licensee must:

(a) 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

(b) 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. 61. NAC 459.210 is hereby amended to read as follows:

459.210 1. Subject to the provisions of NAC 459.010 to 459.950, inclusive, **[**any**]** *and sections 2 to 30, inclusive, of this regulation, a* person who holds a specific license from the Nuclear Regulatory Commission or **[**any**]** *an* agreement state issued by the agency having jurisdiction where the licensee maintains an office for directing the licensed activity and at which radiation safety records are normally maintained **[**,**]** is hereby granted a general license to conduct *within this state* the activities authorized in **[**such licensing document within this state**]** *the specific license* for a period not in excess of 180 days in any calendar year provided that:

(a) The [licensing document] *specific license* does not limit the activity authorized by [such document] *the specific license* to specified installations or locations . [;]

(b) The out-of-state licensee notifies the division in writing at least 3 [days prior to] *business days before* engaging in [such activity.] *the proposed activity and receives written permission from the division to proceed with the proposed activity.* The notification must indicate the location, period and type of proposed possession and use within the state, and must be accompanied by a copy of the [pertinent licensing document.] *specific license.* If, for a specific case, the 3-day period would impose an undue hardship on the out-of-state licensee, he may apply to the division and obtain *written* permission to proceed sooner. The division may waive the requirement for filing additional written notifications during the remainder of the calendar year following the receipt of the initial notification from a person engaging in activities under the general license provided in subsection 1 . [;]

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

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

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

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

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

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

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

(a) In another state, from:

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

(2) The Nuclear Regulatory Commission, by filing for reciprocity or a specific license, if the state is not an agreement state.

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

(1) Filing an NRC Form 241 in accordance with 10 C.F.R. § 150.20(b), as those provisions existed on the effective date of this regulation; or

(2) Filing for a specific license.

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

(a) Such person shall file a report with the division within 30 days after the end of each calendar quarter in which any device is transferred to or installed in this state. Each such report must identify each general licensee to whom such device is transferred by name and address, the type of device transferred and the quantity and type of radioactive material contained in the device;

(b) The device has been manufactured, labeled, installed and maintained in accordance with applicable provisions of the specific license issued to such person by the Nuclear Regulatory Commission or an agreement state;

(c) Such person must assure that any labels required to be affixed to the device under regulations of the authority which licensed manufacture of the device bear a statement that: “Removal of this label is prohibited”; and

(d) The holder of the specific license must furnish to each general licensee to whom he transfers such device or on whose premises he installs such device a copy of the general license contained in NAC 459.216.

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

Sec. 62. NAC 459.212 is hereby amended to read as follows:

459.212 1. A general license is issued authorizing the use and transfer of not more than 15 pounds of source material at any one time by persons in the following categories:

(a) Pharmacists using the source material solely for the compounding of medicinals;

(b) Physicians using the source material for medicinal purposes;

(c) Persons receiving possession of source material from pharmacists and physicians in the form of medicinals or drugs;

(d) Commercial and industrial firms, and research, educational and medical institutions for research, development, educational or commercial purposes; and

(e) If the person so licensed does not receive more than a total of 150 pounds of source material in any 1 calendar year.

2. A person who receives, possesses, uses or transfers source material pursuant to the general license issued under this section is exempt from the provisions of NAC 459.320 to 459.374, inclusive, and 459.780 to 459.794, inclusive, to the extent that the activities

are within the terms of the general license. This exemption does not apply to any person who also possesses source material under a specific license issued pursuant to NAC 459.180 to 459.314, inclusive **[**.**]** *, and sections 17 to 23, inclusive, of this regulation.*

3. A general license is also issued authorizing the receipt of title to source material without regard to quantity. This general license does not authorize any person to receive, possess, use or transfer source material.

Sec. 63. NAC 459.224 is hereby amended to read as follows:

459.224 1. A general license is hereby issued to those persons listed to own, receive, acquire, possess, use and transfer, in accordance with the provisions of subsections 4 and 5, americium 241 in the form of calibration or reference sources:

(a) Any person who holds a specific license issued by the division which authorizes him to receive, possess, use and transfer radioactive material; and

(b) Any person who holds a specific license issued by the Nuclear Regulatory Commission which authorizes him to receive, possess, use and transfer special nuclear material.

2. A general license is hereby issued to own, receive, possess, use and transfer plutonium in the form of calibration or reference sources in accordance with the provisions of subsections 4 and 5 to any person who holds a specific license issued by the division which authorizes him to receive, possess, use and transfer radioactive material.

3. A general license is hereby issued to own, receive, possess, use and transfer radium 226 in the form of calibration or reference sources in accordance with the

provisions of subsections 4 and 5 to any person who holds a specific license issued by the division which authorizes him to receive, possess, use and transfer radioactive material.

4. The general licenses in paragraphs (a), (b) and (c) of subsection 5 **[**,**]** apply only to calibration or reference sources which have been manufactured in accordance with the specifications contained in a specific license issued to the manufacturer or importer of the sources by the Nuclear Regulatory Commission pursuant to 10 C.F.R. § 32.57 or 10 C.F.R. § 70.39 or which have been manufactured in accordance with specifications contained in a specific license issued to the manufacturer by the division or any agreement state pursuant to licensing requirements equivalent to those contained in 10 C.F.R. § 32.57 or 10 C.F.R. § 70.39 of the regulations of the Nuclear Regulatory Commission.

5. The general licenses provided in subsections 1, 2 and 3 are subject to the provisions of NAC 459.124, 459.126, 459.128, 459.134, 459.198, 459.208, 459.312, 459.314, 459.320 to 459.374, inclusive, and 459.780 to 459.794, inclusive. In addition, persons who own, receive, acquire, possess, use or transfer one or more calibration or reference sources pursuant to NAC 459.180 to 459.314, inclusive **[**:**]** *, and sections 17 to 23, inclusive, of this regulation:*

(a) Shall not possess at any one time or at any one location of storage or use more than 5 microcuries of americium 241, 5 microcuries of plutonium and 5 microcuries of radium 226 in those sources;

(b) Shall not receive, possess, use or transfer such a source unless the source or its storage container bears a label which includes the following statement or a substantially similar statement:

(1) The receipt, possession, use and transfer of this source, Model ……, Serial No. ……, are subject to a general license and the regulations of the Nuclear Regulatory Commission or of a state with which the commission has entered into an agreement for the exercise of regulatory authority. Do not remove this label.

CAUTION - RADIOACTIVE MATERIAL - THIS SOURCE

CONTAINS (AMERICIUM 241) (PLUTONIUM) (RADIUM 226)

DO NOT TOUCH RADIOACTIVE PORTION OF THIS SOURCE.

……

Name of manufacturer or importer

(2) The label must show only the name of the appropriate material.

(c) Shall not transfer, abandon or dispose of such source except by transfer to a person authorized by a license from the division, the Nuclear Regulatory Commission or an agreement state to receive the source;

(d) Shall store such source, except when the source is being used, in a closed container adequately designed and constructed to contain americium 241, plutonium or radium 226 which might otherwise escape during storage; and

(e) Shall not use such source for any purpose other than the calibration of radiation detectors or the standardization of other sources.

6. These general licenses do not authorize the manufacture of calibration or reference sources containing americium 241, plutonium or radium 226.

Sec. 64. NAC 459.238 is hereby amended to read as follows:

459.238 1. An application for a license will be approved if the division determines that:

(a) The applicant is qualified by reason of training and experience to use the material in question for the purpose requested in accordance with the provisions of NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* in a manner to minimize danger to public health and safety or property;

(b) The applicant's proposed equipment, facilities and procedures are adequate to minimize danger to public health and safety or property;

(c) The issuance of the license will not be inimical to the health and safety of the public; and

(d) The applicant satisfies any applicable special requirements in NAC 459.240 to 459.307, inclusive.

2. The division will deny an application for a license if the division determines that:

(a) The issuance of the license would be inimical to the health and safety of the public;

(b) The applicant does not satisfy the requirements of paragraph (a), (b) or (d) of subsection 1; or

(c) The applicant has held a license authorizing a similar use of radioactive material issued by the division or by the appropriate licensing agency in another jurisdiction and the license has either been revoked or the licensee has been cited for a violation, which the division deems significant, of a regulation relating to matters of health and safety.

Sec. 65. NAC 459.240 is hereby amended to read as follows:

459.240 In addition to the requirements set forth in NAC 459.238, a specific license for institutional use of radioactive material on human beings will be issued if all **[**of**]** the following requirements are satisfied:

1. The applicant has appointed a committee on radiation safety to oversee the use of radioactive material throughout the institution and review the institution's safety program. The committee must consist of at least the following members:

(a) An authorized user for each type of use permitted by the license;

(b) A representative of the nursing staff;

(c) A representative of the institution's management who is neither an authorized user nor a radiation safety officer; and

(d) The radiation safety officer.

2. The applicant possesses adequate facilities for the clinical care of patients.

3. A physician designated as an authorized user has the training and experience required in NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* that is appropriate to the type of usage of radioactive material for which he is authorized and, where applicable, the clinical management of patients who are radioactive.

4. The operating procedures for radiation safety proposed by the applicant are adequate for the handling and disposal of the quantities and types of radioactive materials specified in the application.

Sec. 66. NAC 459.242 is hereby amended to read as follows:

459.242 In addition to the requirements in NAC 459.238, a specific license for the human use of radioactive material will be issued to an individual physician if:

1. The applicant has access to a hospital possessing adequate facilities to hospitalize and monitor the radioactive patients of the applicant whenever it is advisable;

2. The applicant has the training and experience required in NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* that is appropriate to the type of usage of radioactive material for which he is authorized and, where applicable, the clinical management of radioactive patients; and

3. The operating procedures for radiation safety proposed by the applicant are adequate for the handling and disposal of the quantities and types of radioactive materials specified in the application.

Sec. 67. NAC 459.245 is hereby amended to read as follows:

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

(a) **[**Radioactive material**]** *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 **[**§ 32.72, 32.73, or 32.74 of**]** 10 C.F.R. **[**Part 32,**]** *§ 32.74, as those provisions existed on the effective date of this regulation,* or the equivalent regulations of an agreement state.

(b) **[**Reagent kits that have been manufactured, labeled, packaged, and distributed in accordance with an approval given by the Nuclear Regulatory Commission pursuant to § 32.73 of 10 C.F.R. Part 32, or an agreement state under equivalent regulations for the preparation of radiopharmaceuticals for medical use.

(c)**]** 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 the effective date of this regulation,* or the equivalent regulations of an agreement state.

[(d) Radiopharmaceuticals approved by the United States Food and Drug Administration. A list of these radiopharmaceuticals and changes to the listing are available from the division upon request.**]**

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

(a) The amount of activity of the photon-emitting radionuclide in each radiopharmaceutical dosage immediately before administration to a patient **[**.

3.**]** *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 the effective date of this regulation, 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.

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

[5.**]** *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.

[6.**]** *7.* Except as otherwise provided in paragraph (d) of subsection **[**3,**]** *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 **[**3**]** *4* must include:

(a) For paragraph (a) of subsection **[**3,**]** *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 **[**3,**]** *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 **[**signature of the radiation safety officer;**]** *initials of the person who performed the check;*

(c) For paragraph (c) of subsection **[**3,**]** *4,* the model and serial number of the dose calibrator, the calculated activities, the measured activities, the date of the test **[**,**]** and the **[**signature of the radiation safety officer;**]** *initials of the person who performed the check;* and

(d) For paragraph (d) of subsection **[**3,**]** *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 **[**signature of the radiation safety officer.**]** *initials of the person who performed the check.*

Sec. 68. NAC 459.247 is hereby amended to read as follows:

459.247 1. A licensee may use *for uptake, dilution or excretion studies* any *unsealed* radioactive material **[**in a radiopharmaceutical or for diagnostic use in measuring uptake, dilution, or excretion of a substance for which the United States Food and Drug Administration has accepted a "Notice of Claimed Investigational Exemption for a New Drug" or has approved a "New Drug Application."**]** *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 the effective date of this regulation, 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.

Sec. 69. NAC 459.2481 is hereby amended to read as follows:

459.2481 1. A licensee may use *for imaging and localization studies* any *unsealed* radioactive material **[**in a diagnostic radiopharmaceutical or any generator or reagent kit for preparation and diagnostic use of a radiopharmaceutical containing radioactive

material for which the United States Food and Drug Administration has accepted a "Notice of Claimed Investigational Exemption for a New Drug" or approved a "New Drug Application."

2. A licensee shall elute generators and prepare reagent kits in accordance with the manufacturer's instructions.

3.] *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 the effective date of this regulation, 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.

[4.**]** *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.

[5.**]** *4.* A licensee who is required to measure molybdenum concentration pursuant to subsection **[**4**]** *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.

[6.**]** *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.

Sec. 70. NAC 459.255 is hereby amended to read as follows:

459.255 1. A licensee may use any *unsealed* radioactive material **[**in a radiopharmaceutical which is used therapeutically and for which the United States Food and Drug Administration has accepted a "Notice of Claimed Investigational Exemption for a New Drug" or approved a "New Drug Application." The licensee shall comply with the package insert instructions regarding indications and method of administration.**]** *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 the effective date of this regulation, 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.

Sec. 71. NAC 459.256 is hereby amended to read as follows:

459.256 1. A licensee shall not authorize release from confinement for medical care **[**any patient**]** *a natural person* given a radiopharmaceutical until:

(a) The measured dose rate from the **[**patient**]** *natural person* is less than 5 millirems per hour at a distance of one meter; or

(b) The activity in the **[**patient**]** *natural person* is less than 30 millicuries.

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

3. Immediately after removing the last temporary implant source from a **[**patient,**]** *natural person,* the licensee shall make a radiation survey of the **[**patient**]** *natural person*

with a radiation detection survey instrument to confirm that all sources have been removed.

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

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

(a) The date of the survey;

(b) The name of the **[**patient;**]** *natural person;*

(c) The dose rate from the **[**patient**]** *natural person* expressed as millirem per hour and measured at one meter from the **[**patient;**]** *natural person;*

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

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

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

to have difficulty in understanding the instructions, the licensee shall contact a member of the family of the **[**patient,**]** *natural person,* his guardian **[**,**]** or other representative until a person is found who can communicate the meaning of the instructions to the **[**patient.**]** *natural person.*

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

Sec. 72. NAC 459.2571 is hereby amended to read as follows:

459.2571 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 **[**patient's condition,**]** *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 **[**patient's record;**]** *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 **[**patient's condition,**]** *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 **[**patient's record;**]** *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.

Sec. 73. NAC 459.2572 is hereby amended to read as follows:

459.2572 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.

Sec. 74. NAC 459.2573 is hereby amended to read as follows:

459.2573 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.

Sec. 75. NAC 459.2575 is hereby amended to read as follows:

459.2575 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 **[**patient,**]** *natural person who received the misadministration,* or a relative or guardian responsible for the **[**patient,**]** *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, **[**patient,**]** *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 **[**patient;**]** *natural person who received it;*

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

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

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

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

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

(e) Within 15 days after he discovers the misadministration, submit to **[**any patient,**]** *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 **[**patient,**]** *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 **[**patient,**]** *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, **[**any patient,**]** *a natural person,* or any relative or guardian responsible for **[**any patient.**]** *a natural person.*

Sec. 76. NAC 459.2576 is hereby amended to read as follows:

459.2576 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 **[**the patient,**]** *, 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 **[**patient,**]** *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 **[**patient;**]** *natural person who received it;*

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

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

Sec. 77. NAC 459.264 is hereby amended to read as follows:

459.264 The types of broad licenses available are:

1. A “type A specific license of broad scope” is a specific license authorizing receipt, acquisition, ownership, possession, use and transfer of any chemical or

physical form of the radioactive material specified in the license, not exceeding quantities specified in the license, for any authorized purpose **[**.**]** *, including, without limitation, medical use of radioactive material.* The quantities specified are usually in the multicurie range.

2. A "type B specific license of broad scope" is a specific license authorizing receipt, acquisition, ownership, possession, use and transfer of any chemical or physical form of radioactive material specified in NAC 459.266, for any authorized purpose. The possession limit for a type B broad license, if only one radionuclide is possessed under the license, is the quantity specified for that radionuclide in column I of NAC 459.266. If two or more radionuclides are possessed, the possession limit for each is determined as follows: For each radionuclide, determine the ratio of the quantity possessed to the applicable quantity specified in column I of NAC 459.266 for that radionuclide. The sum of the ratios for all radionuclides possessed under the license must not exceed unity.

3. A "type C specific license of broad scope" is a specific license authorizing receipt, acquisition, ownership, possession, use and transfer of any chemical or physical form of radioactive material specified in NAC 459.266 for any authorized purpose. The possession limit for a type C broad license, if only one radionuclide is possessed, is the quantity specified for that radionuclide in column II of NAC 459.266. If two or more radionuclides are possessed, the possession limit is determined for each as follows: For each radionuclide determine the ratio of the quantity possessed to the

applicable quantity specified in column II of NAC 459.266 for that radionuclide. The sum of the ratios for all radionuclides possessed under the license must not exceed unity.

Sec. 78. NAC 459.300 is hereby amended to read as follows:

459.300 *1.* An application for a specific license to manufacture **[**and distribute**]** *, 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:

[1.**]** *(a)* The applicant satisfies the general requirements specified in NAC 459.238;

[2.**]** *(b)* The applicant submits evidence that **[**:

(a) The radiopharmaceutical containing radioactive material will be manufactured, labeled, and packaged in accordance with the Federal Food, Drug and Cosmetic Act or the Public Health Service Act, as a new drug application approved by the Food and Drug Administration, a biologic product license issued by the administration, or a "Notice of Claimed Investigational Exemption for a New Drug" that has been accepted by the administration; or

(b) The manufacture and distribution of the radiopharmaceutical containing radioactive material is not subject to the Federal Food, Drug and Cosmetic Act and the Public Health Services Act;

3.**]** *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, **[**packaging including**]** maximum activity per **[**package**]** *vial, syringe, generator or other container of the radiopharmaceutical* and shielding provided by the packaging of the radioactive material **[**which**]** *to demonstrate that it* is appropriate for safe handling and storage of radiopharmaceuticals by licensees **[**; and

4. The**]** *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 **[**package**]** *transport radiation shield* of the radiopharmaceutical **[**contains information on the radionuclide, quantity, and date of assay and the label affixed to each package, or the leaflet or brochure which accompanies each package, contains a statement that the radiopharmaceutical is licensed by the division for distribution to persons licensed for medical use pursuant to NAC 459.240, 459.242, or 459.258, or under equivalent licenses of the Nuclear Regulatory Commission or an agreement state. The labels, leaflets, or brochures required by this section are in addition to the labeling required by the Food and Drug Administration and they may be separate from or, with the approval of the administration, may be

combined with the labeling required by the administration.] , *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 radiopharmaceuticals for medical use if the radiopharmaceutical is prepared by:

(1) An authorized nuclear pharmacist; or

(2) A person under the supervision of an authorized nuclear pharmacist pursuant to section 26 of this regulation.

(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 section 29 of this regulation 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 an authorized user on a license for a nuclear pharmacy issued by the division, the Nuclear Regulatory Commission 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.

Sec. 79. NAC 459.312 is hereby amended to read as follows:

459.312 1. A licensee may transfer radioactive material only as authorized in this section.

2. Except as otherwise provided in his license and subject to the provisions of subsections 3 and 4, any licensee may transfer radioactive material:

(a) To the division but only after receiving prior approval from the division;

(b) To the *United States* Department of Energy;

(c) To any person exempt from the provisions of NAC 459.180 to 459.314, inclusive, *and sections 17 to 23, inclusive, of this regulation* to the extent permitted under the exemption;

(d) To any person authorized to receive the material under terms of a general license or its equivalent, or a specific license or equivalent licensing document, issued by the

division, the Nuclear Regulatory Commission, or any agreement state, or to any person otherwise authorized to receive material by the Federal Government or any agency thereof, the division or any agreement state; or

(e) As otherwise authorized by the division in writing.

3. Before transferring radioactive material to a specific licensee of the division, the Nuclear Regulatory Commission, an agreement state, or to a general licensee who is required to register with the Nuclear Regulatory Commission or an agreement state **[**prior to**]** *before* receipt of the radioactive material, the licensee transferring the material shall verify that the transferee's license authorizes the receipt of the type, form and quantity of radioactive material to be transferred.

4. The following methods for the verification required by subsection 3 are acceptable:

(a) The transferor may have in his possession, and read, a current copy of the transferee's specific license or registration certificate;

(b) The transferor may have in his possession a written certification by the transferee that he is authorized by license or registration certificate to receive the type, form and quantity of radioactive material to be transferred, specifying the license or registration certificate number, issuing agency and expiration date;

(c) For emergency shipments the transferor may accept oral certification confirmed in writing within 10 days by the transferee that he is authorized by license or registration certificate to receive the type, form and quantity of radioactive material to be transferred,

specifying the license or registration certificate number, issuing agency and expiration date;

(d) The transferor may obtain other sources of information compiled by a reporting service from official records of the division, the Nuclear Regulatory Commission, or the licensing agency of an agreement state as to the identity of licensees and the scope and expiration dates of licenses and registration; or

(e) When none of the methods of verification described in paragraphs (a) to (d), inclusive, are readily available or when a transferor desires to verify that information received by one of such methods is correct or up to date, the transferor may obtain and record confirmation from the division or the Nuclear Regulatory Commission, or the licensing agency of an agreement state, that the transferee is licensed to receive the radioactive material.

5. Preparation for shipment and transport of radioactive material must be in accordance with the provisions of NAC 459.314.

Sec. 80. NAC 459.314 is hereby amended to read as follows:

459.314 1. **[**No**]** *Except as otherwise provided in subsection 3, no* licensee may deliver any radioactive material to a carrier for transport, unless:

(a) The licensee complies with the applicable requirements of the regulations **[**,**]** appropriate to the mode of transport of the *United States* Department of Transportation *;* **[**relating to the packing of radioactive material and to the monitoring, marking and labeling of those packages;**]**

(b) The licensee has established procedures for opening and closing a package in which radioactive material is transported to provide safety **[**to**]** and *to* ensure that **[**prior to**]** *before* the delivery to a carrier for transport, each package is properly closed for transport; and

(c) **[**Prior to**]** *Before* delivery of a package to a carrier for transport, the licensee must assure that any special instructions needed to **[**safely**]** open *safely* the package are sent to or have been made available to the consignee.

2. For the purpose of subsection 1, a licensee who transports his own licensed material as a private carrier is considered to have delivered such material to a carrier for transport.

3. Subsection 1 does not apply to the transportation of licensed material **[**,**]** or to the delivery of licensed material to a carrier for transport **[**,**]** where the transportation is subject to the regulations of the *United States* Postal Service.

Sec. 81. NAC 459.320 is hereby amended to read as follows:

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

diagnosis and therapy, does not exceed the standards of radiation protection **[**prescribed**]** *set forth* in those sections. 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 **[**patients**]** *natural persons* to radiation for the purpose of medical **[**diagnosis or therapy**]** *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. 82. NAC 459.3205 is hereby amended to read as follows:

459.3205 The state board of health hereby adopts by reference appendices A, B and C to 10 C.F.R. §§ 20.1001 to 20.2402, inclusive, as those provisions existed on January 1, **[**1993.**]** *1998.* A copy of the volume containing these appendices may be purchased from the Superintendent of Documents, United States Government Printing Office, **[**Washington, D.C. 20402,**]** *P.O. Box 371954, Pittsburgh, Pennsylvania 15250-7854,* for the price of **[**$29.**]** *$39.*

Sec. 83. NAC 459.321 is hereby amended to read as follows:

459.321 Each licensee and registrant shall:

1. Develop, document and carry out a program for protection against radiation commensurate with the scope of its licensed or registered activities and sufficient to ensure compliance with the provisions of NAC 459.010 to 459.950, inclusive **[**.**]** *, and sections 2 to 30, inclusive, of this regulation.*

2. Use, to the extent practicable, procedures and engineering controls for protection against radiation to achieve occupational doses and doses to members of the public as low as is reasonably achievable.

3. Review, at intervals not to exceed 12 months, the content and implementation of the program for protection against radiation.

Sec. 84. NAC 459.3235 is hereby amended to read as follows:

459.3235 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	0.05
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, *and sections 2 to 30, inclusive, of this regulation* 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 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
	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. 85. NAC 459.337 is hereby amended to read as follows:

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

(a) Are necessary for the licensee or registrant to comply with NAC 459.010 to 459.950, inclusive **[**;**]** *, and sections 2 to 30, inclusive, of this regulation;* and

(b) Are necessary under the circumstances to evaluate:

(1) Radiation levels;

(2) Concentrations or quantities of radioactive material; and

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

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

3. All personnel dosimeters, except for direct and indirect reading pocket ionization chambers and those dosimeters used to measure the dose to any extremity, that require processing to determine the dose of radiation and that are used by licensees and registrants to comply with NAC 459.325, with other applicable provisions of NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation,* or with conditions specified in a license or registration, must be processed and evaluated by a dosimetry processor who is accredited by the National Voluntary Laboratory Accreditation Program of the National Institute of Standards and Technology for the type of radiation or radiations included in the program that most closely approximate the type of radiation for which the person wearing the dosimeter is monitored.

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

Sec. 86. NAC 459.339 is hereby amended to read as follows:

459.339 Each licensee and registrant shall monitor exposures from sources of radiation at levels sufficient to demonstrate compliance with the limits for occupational

doses specified in NAC 459.010 to 459.950, inclusive **[**.**]** *, and sections 2 to 30, inclusive, of this regulation.* As a minimum:

1. Each licensee and registrant shall monitor occupational exposure to radiation and shall supply and require the use of personnel monitoring equipment by:

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

(b) Minors and women who have declared their pregnancy who are likely to receive in 1 year, from sources of radiation external to the body, a dose in excess of 10 percent of any of the applicable limits specified in NAC 459.331 or 459.333; and

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

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

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

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

Sec. 87. NAC 459.349 is hereby amended to read as follows:

459.349 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 authorization to use that equipment. 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.

(c) The licensee shall carry out 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;

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

(3) Testing respiratory protective devices for operability 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) Testing for operability immediately before each use;

(II) The supervision and training of personnel;

(III) Recordkeeping; and

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

(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 **[**devices, and at **]** *device and:*

(I) At least once every 12 months after the initial fitting **[**, that each user is physically able to use the respiratory protective device.**]** *; or*

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

(e) The licensee shall advise each user of a respiratory protective device that the user may leave the area at any time 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 procedural 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.

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 **[**peak

concentration] *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 assigning respiratory protection factors in excess of those specified in appendix A. The division may authorize a licensee to use higher protection factors upon receipt of an application that:

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

(2) Demonstrates that the respiratory protective device 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.

Sec. 88. NAC 459.355 is hereby amended to read as follows:

459.355 1. Except as otherwise provided in this section or as otherwise authorized by the division, a licensee or registrant shall use a radiation symbol with a three-bladed design as follows:

(a) Each cross-hatched area must be magenta, purple or black; and

(b) The background must be yellow.

2. A licensee may label sources of radiation, holders for sources of radiation or device components containing sources of radiation that are subjected to high temperatures, with conspicuously etched or stamped radiation symbols that do not comply with the requirements for color set forth in subsection 1.

3. In addition to the contents of signs and labels **[**prescribed in**]** *required by* NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation,* a licensee or registrant shall provide, on or near the required signs and labels, additional information, as appropriate, to make persons aware of potential exposures and to minimize those exposures.

4. A radiation symbol or the labels described in NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* must only be used when conditions exist that warrant their use.

Sec. 89. NAC 459.3575 is hereby amended to read as follows:

459.3575 A licensee is not required to label a container pursuant to NAC 459.357 if the container is:

1. Holding licensed radioactive material in quantities that are less than the quantities listed in appendix C.

2. Holding licensed radioactive material in concentrations that are less than those specified in table III of appendix B.

3. Attended by a person who takes the precautions necessary to prevent the exposure of persons in excess of the limits established by NAC 459.010 to 459.950, inclusive **[**.**]** , *and sections 2 to 30, inclusive, of this regulation.*

4. In transport and is packaged and labeled in accordance with the regulations of the United States Department of Transportation.

5. Accessible only to persons authorized to work in the vicinity of the container or authorized to handle or use the container, if the contents of the container are identified to those persons by a readily available written record which is retained while the container is in use for the purpose indicated on the record.

6. Installed manufacturing or process equipment.

Sec. 90. NAC 459.359 is hereby amended to read as follows:

459.359 1. A licensee shall dispose of licensed radioactive material only:

(a) By transfer to an authorized recipient as provided in NAC 459.180 to 459.314, inclusive, *and sections 17 to 23, inclusive, of this regulation,* and **[**459.823**]** *459.8235* to 459.950, inclusive *,* **[**;**]** *and section 30 of this regulation;*

(b) By decay in storage;

(c) By release in effluents within the limits specified in NAC 459.335; or

(d) As authorized pursuant to NAC 459.3595 to 459.3615, inclusive.

2. A person must be licensed by the division to receive waste containing licensed radioactive material from other persons for:

(a) Treatment before disposal;

(b) Treatment or disposal by incineration;

(c) Decay in storage;

(d) Disposal at a land disposal facility licensed pursuant to NAC 459.806 to 459.8225, inclusive; or

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

Sec. 91. NAC 459.3595 is hereby amended to read as follows:

459.3595 A licensee or applicant for a license may apply to the division for approval of proposed procedures, not otherwise authorized pursuant to NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* to dispose of licensed radioactive material generated in the operations of the licensee. Each application must include:

1. A description of the waste containing the licensed radioactive material to be disposed of, including *, without limitation,* the physical and chemical properties that have an impact on evaluating the risk of the proposed procedures, and the proposed manner and conditions of disposing of the waste;

2. An analysis and evaluation of pertinent information related to the impact of the proposed procedures on the environment;

3. The nature and location of other potentially affected facilities; and

4. Analyses and procedures to ensure that doses are maintained as low as are reasonably achievable and within the limits specified in NAC 459.325, 459.331, 459.333 and 459.335.

Sec. 92. NAC 459.3605 is hereby amended to read as follows:

459.3605 1. Except as otherwise provided in subsection 2, a licensee may discharge licensed radioactive material into sanitary sewerage only if each of the following conditions is satisfied:

(a) The material is readily soluble in water **[**,**]** or is readily dispersible biological material in water.

(b) The quantity of all radioactive material that the licensee releases into the sanitary sewerage in 1 month divided by the average monthly volume of water released into the sanitary sewerage by the licensee does not exceed the concentration of radioactive material listed in table 3 of appendix B.

(c) The total quantity of all radioactive material that the licensee releases into the sanitary sewerage in 1 year does not exceed 5 curies of hydrogen-3, 1 curie of carbon-14 **[**or**]** *and* 1 curie of all other radioactive materials combined.

(d) If more than one radionuclide is released:

(1) The licensee determines the fraction of the limits in table 3 of appendix B represented by discharges into sanitary sewerage by dividing the actual monthly average concentration of each radionuclide released by the licensee into the sanitary sewerage by the concentration of that radionuclide listed in table 3 of appendix B; and

(2) The sum of the fractions for each radionuclide required by subparagraph (1) does not exceed unity.

2. Excreta from persons undergoing medical diagnosis or therapy with radioactive material is not subject to the limitations contained in subsection 1.

Sec. 93. NAC 459.3625 is hereby amended to read as follows:

459.3625 1. **[**Each**]** *Except as otherwise provided in subsection 4, each* licensee and registrant shall use the units curie, rad, rem and roentgen, including multiples and subdivisions thereof, to prepare the records required by NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation,* and shall clearly indicate the units of all quantities entered on those records.

2. The licensee or registrant shall make a clear distinction among the quantities entered on the records required by NAC 459.010 to 459.950, inclusive **[**.**]** *, and sections 2 to 30, inclusive, of this regulation.*

3. A discontinuance or curtailment of the activities of a licensee or registrant does not relieve that licensee or registrant of the responsibility for retaining all records required by NAC 459.010 to 459.950, inclusive **[**.**]** *, and sections 2 to 30, inclusive, of this regulation.* A licensee or registrant may request the division to retain such records. An acceptance of the records by the division relieves the licensee or registrant of subsequent responsibility only in respect to their retention as required by this section.

4. Each licensee or registrant shall use to prepare shipment manifests required pursuant to section 30 of this regulation:

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

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

Sec. 94. NAC 459.363 is hereby amended to read as follows:

459.363 1. Each record required by NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* must be legible throughout the specified period of retention. The record must be:

(a) The original;

(b) A reproduced copy or a microform, if the copy or microform is authenticated by authorized personnel and, if microform is used, the microform is capable of producing a clear copy throughout the specified period of retention; or

(c) Stored in electronic media with the capability for producing legible, accurate and complete records during the specified period of retention.

2. A licensee or registrant shall maintain adequate safeguards to prevent tampering with and the loss of records.

Sec. 95. NAC 459.365 is hereby amended to read as follows:

459.365 1. For each person who **[**enters the restricted area of a licensee or registrant and**]** is likely to receive, in 1 year, an occupational dose requiring monitoring pursuant to NAC 459.339, the licensee or registrant shall:

(a) Determine the occupational dose received by that person during the current year; and

(b) Attempt to obtain the records of the lifetime cumulative occupational dose received by that person.

2. Before permitting a person to participate in a planned special exposure, the licensee or registrant shall determine:

(a) The internal and external doses received by that person from all previous planned special exposures;

(b) All doses in excess of the limits, including *, without limitation,* doses received during accidents and emergencies, received during the lifetime of the person; and

(c) All lifetime cumulative occupational doses.

3. To comply with the requirements of subsection 1, a licensee or registrant may:

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

(b) Accept, as the record of the lifetime cumulative dose received by a person, a current form regarding history of cumulative occupational exposure, signed by the person and countersigned by:

(1) An appropriate official of the most recent employer of the person for work involving exposure to radiation; or

(2) The current employer of the person, if the person is not employed by the licensee or registrant.

(c) Obtain reports regarding the dose equivalent of a person from his most recent employer for work involving exposure to radiation, or the current employer of the

person if he is not employed by the licensee or registrant, by telephone, telegram, facsimile *, electronic media* or letter. The licensee or registrant shall request a written verification of the data if the authenticity of the transmitted report cannot be established.

4. A licensee or registrant shall record the history of exposure of each person, as required by subsection 1, on a form regarding history of cumulative occupational exposure, and shall include all the information required by that form. The form must show each period in which the person received occupational exposure to radiation or radioactive material and must be signed by that person. For each period for which the licensee or registrant obtains a report, the licensee or registrant shall use the dose shown in the report in preparing the form regarding history of cumulative occupational exposure. For any period in which the licensee or registrant does not obtain a report, the licensee or registrant shall place a notation on the form regarding history of cumulative occupational exposure indicating the periods for which data is not available.

5. Licensees and registrants are not required to reevaluate the separate dose equivalents received from sources of radiation outside the body and committed dose equivalents or intakes of radionuclides received from radioactive material taken into the body that are assessed before January 18, 1994. Histories of occupational exposure obtained and recorded on the form regarding history of cumulative occupational exposure before January 18, 1994, may be used in the absence of specific information regarding the intake of radionuclides by the person.

6. If the licensee or registrant is unable to obtain a complete record of the current and previously accumulated occupational dose of a person, the licensee or registrant shall:

(a) In establishing administrative controls pursuant to subsection 6 of NAC 459.325 for the current year, assume that the allowable limits for the person are reduced by 1.25 rems for each quarter for which records were unavailable and the person was engaged in activities that could have resulted in occupational exposure; and

(b) Assume that the person is not available for planned special exposures.

7. The licensee or registrant shall retain the records on the form regarding history of cumulative occupational exposure until the division terminates each license or registration requiring the records. The licensee or registrant shall retain each record used in preparing the form regarding history of cumulative occupational exposure for at least 3 years after that record is made.

Sec. 96. NAC 459.3673 is hereby amended to read as follows:

459.3673 Each licensee shall maintain records of the disposal of licensed radioactive materials made pursuant to the provisions of NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation,* including any burial authorized before April 27, 1984. The licensee shall retain the records required by this section until the division terminates each license or registration requiring the records.

Sec. 97. NAC 459.3695 is hereby amended to read as follows:

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

(a) A person to receive:

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

(2) An eye dose equivalent of 75 rems or more; or

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

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

2. Except as otherwise provided in NAC 459.369, each licensee and registrant shall, within 24 hours after discovery, report to the division each event involving the loss of control of a licensed or registered source of radiation possessed by the licensee or registrant that may have caused, or threatens to cause:

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

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

(2) An eye dose equivalent exceeding 15 rems; or

(3) A shallow-dose equivalent to the skin or extremities or a total organ dose equivalent exceeding 50 rems.

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

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

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

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

Sec. 98. NAC 459.371 is hereby amended to read as follows:

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

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

(b) Doses in excess of:

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

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

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

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

(5) Any applicable limits set forth in the license or registration.

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

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

(2) An unrestricted area in excess of 10 times the applicable limits set forth in NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation,* or in the license or registration.

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

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

(a) Estimates of the dose of each person;

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

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

(d) Corrective steps taken or planned to ensure against a recurrence, including the schedule for achieving conformance with applicable limits, generally applicable environmental standards for radiation of the United States Environmental Protection Agency **[**,**]** and associated conditions set forth in the license or registration.

3. Each report filed pursuant to this section must include, for each person exposed, his name, social security number and date of birth. With respect to reports of exposure to an embryo, the information must relate to the woman carrying the embryo. The report must be prepared so that the information required by this subsection is stated in a separate and detachable portion of the report.

Sec. 99. NAC 459.373 is hereby amended to read as follows:

459.373 In addition to complying with any other reporting requirements specified in NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation,* a licensee shall comply with the following reporting requirements:

1. Each licensee shall notify the division as soon as possible, but not later than 4 hours, after the discovery of an event that prevents immediate protective actions to be taken that are necessary to avoid exposure to radiation or radioactive materials that could exceed the limits specified in NAC 459.010 to 459.950, inclusive **[**.**]** *and sections 2 to 30, inclusive, of this regulation.*

2. Each licensee shall notify the division within 24 hours after the discovery of any of the following events involving licensed radioactive material:

(a) An unplanned event causing radioactive contamination that:

(1) Requires access to the contaminated area **[**,**]** by workers or members of the public **[**,**]** to be restricted for more than 24 hours by imposing additional radiological controls or by prohibiting entry into the area, if such a restriction is imposed for any reason other than to allow isotopes with a half-life of less than 24 hours to decay in storage before decontamination; and

(2) Involves a quantity of radioactive material which is greater than five times the lowest annual limit on intake specified in appendix B for that material.

(b) An event in which equipment is disabled or fails to function as designed if:

(1) The equipment is required pursuant to NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation,* or as a condition of a license, to prevent releases of or exposure to radioactive materials exceeding the limits specified in NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation,* or to mitigate the consequences of an accident;

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

(3) Other equipment is not available and operable to perform the required safety function.

(c) An event that requires unplanned medical treatment at a medical facility for a person who has spreadable radioactive contamination on his clothing or body.

(d) An unplanned fire or explosion damaging any licensed radioactive material or any device, container or equipment containing licensed radioactive material if:

(1) The quantity of radioactive material involved is greater than five times the lowest annual limit on intake specified in appendix B for that radioactive material; and

(2) The damage affects the integrity of the licensed radioactive material or its container.

3. Reports made by a licensee pursuant to this section must be made as follows:

(a) A licensee shall make the reports required by subsections 1 and 2 by telephone. To the extent that the information is available at the time of notification by telephone, the information provided in these reports must include **[**:**]** *, without limitation:*

(1) The name and telephone number of the caller;

(2) A description of the event, including *, without limitation,* the date and time of the event;

(3) The exact location of the event;

(4) The isotopes, quantities **[**,**]** and chemical and physical form of the licensed radioactive material involved; and

(5) Any data regarding the exposure of persons to radiation because of the event.

(b) Except as otherwise provided in paragraph (c) of this subsection, each licensee who makes a report by telephone shall submit a written report to the division within 30 days after the report by telephone is made. The written report must contain:

(1) A description of the event, including *, without limitation,* the probable cause of the event and the manufacturer and model number of any equipment that failed or malfunctioned;

(2) The exact location of the event;

(3) The isotopes, quantities **[**,**]** and chemical and physical form of the licensed radioactive material involved;

(4) The date and time of the event;

(5) Any corrective actions taken or planned regarding the event;

(6) The results of any evaluations or assessments regarding the event; and

(7) The extent of any exposure of persons to radiation or to radioactive materials because of the event, without identifying those persons by name.

(c) A licensee is not required to comply with the provisions of paragraph (b) if a report submitted pursuant to NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* contains all **[**of**]** the information required by paragraph (b).

Sec. 100. NAC 459.381 is hereby amended to read as follows:

459.381 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. **[**Permits any person to work as an authorized user under the license.

3.**]** Changes radiation safety officers or teletherapy physicists.

[4.**]** *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.

[5.**]** *4.* Adds to or changes:

(a) Any address of use;

(b) Any area of use; or

(c) Any restricted area.

Sec. 101. NAC 459.3815 is hereby amended to read as follows:

459.3815 A licensee shall **[**notify**]** *:*

1. Notify the division by letter within 30 days after **[**an**]***:*

(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 when the**]** *; 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.

Sec. 102. NAC 459.3821 is hereby amended to read as follows:

459.3821 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, *and sections 2 to 30, inclusive, of this regulation,* 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 **[**;**]** *, and sections 24 to 29, inclusive, of this regulation;*

(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.

Sec. 103. NAC 459.3824 is hereby amended to read as follows:

459.3824 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 sections 28 and 29 of this regulation* 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.

Sec. 104. NAC 459.383 is hereby amended to read as follows:

459.383 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*.

Sec. 105. NAC 459.3841 is hereby amended to read as follows:

459.3841 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 **[**of dosage**]** 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 **[**200**]** *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.

Sec. 106. NAC 459.3861 is hereby amended to read as follows:

459.3861 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 **[**patient-by-patient**]** *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 **[**of dosage**]** in the contiguous restricted and unrestricted areas with a radiation survey instrument to demonstrate compliance with the prescribed *dose* rates **[**of dosage**]** 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 **[**patient's**]** 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.

[7.**]** *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.

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

Sec. 107. NAC 459.3864 is hereby amended to read as follows:

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

1. Test every source for leakage and report in accordance with the provisions of NAC 459.307 each source that is leaking. In the case of radium sources the leak test must be capable of detecting the escape of radon at the rate of 0.001 microcurie per 24 hours. If the leak test on a radium source detects the escape of radon at the rate of 0.001 microcurie 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 **[**once each quarter.**]** *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 **[**once each quarter,**]** *quarterly,* conduct with a radiation detection instrument a survey of all areas where sealed sources are stored to determine ambient dose rates. This requirement is not applicable to teletherapy sources in teletherapy units.

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

(a) The date of the survey;

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

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

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

(e) The signature of the radiation safety officer.

Sec. 108. NAC 459.3871 is hereby amended to read as follows:

459.3871 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 **[**of the patient**]** 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 **[**patient's**]** 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.

Sec. 109. NAC 459.3875 is hereby amended to read as follows:

459.3875 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.

Sec. 110. NAC 459.3881 is hereby amended to read as follows:

459.3881 A licensee shall, for each patient *or human research subject* receiving implant therapy:

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 [patient-by-patient] *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 [of dosage] 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 [of dosage] 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 reasonably achievable before releasing the patient or human research subject.*

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

Sec. 111. NAC 459.3895 is hereby amended to read as follows:

459.3895 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.

Sec. 112. NAC 459.3901 is hereby amended to read as follows:

459.3901 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 **[**of**]** *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.

Sec. 113. NAC 459.394 is hereby amended to read as follows:

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

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

(a) The American Board of Health Physics, in **[**Comprehensive Health Physics;**]** *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; or**]** *nuclear medicine;*

(e) The Board of Pharmaceutical Specialties, in **[**Nuclear Pharmacy;**]** *nuclear pharmacy;*

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

(g) The American Osteopathic Board of Radiology;

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

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

2. 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 **[**the State of Nevada,**]** *this state,* the Nuclear Regulatory Commission **[**,**]** or an agreement state that authorizes the medical use of radioactive material; or

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

Sec. 114. NAC 459.3944 is hereby amended to read as follows:

459.3944 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; **[**or**]**

(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 **[**persons**]** *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; **[**or**]**

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.

Sec. 115. NAC 459.3946 is hereby amended to read as follows:

459.3946 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; **[**or**]**

(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; **[**or**]**

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.

Sec. 116. NAC 459.3948 is hereby amended to read as follows:

459.3948 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; **[**or**]**

(b) The American Board of Radiology , in radiology **[**or**]** , 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 **[**three**]** *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.

Sec. 117. NAC 459.395 is hereby amended to read as follows:

459.395 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 **[**has**]** *:*

1. Has the following supervised clinical experience:

[1.**]** *(a)* At least 80 hours of classroom and laboratory training that included:

[(a)**]** *(1)* Radiation physics and instrumentation;

[(b)**]** *(2)* Radiation protection;

[(c)**]** *(3)* Mathematics pertaining to the use and measurement of radioactivity; and

[(d)**]** *(4)* Radiation biology; and

[2.**]** *(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.

Sec. 118. NAC 459.3952 is hereby amended to read as follows:

459.3952 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 **[**has**]** *:*

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:

[1.**]** *(a)* At least 80 hours of classroom and laboratory training that included:

[(a)**]** *(1)* Radiation physics and instrumentation;

[(b)**]** *(2)* Radiation protection;

[(c)**]** *(3)* Mathematics pertaining to the use and measurement of radioactivity; and

[(d)**]** *(4)* Radiation biology; and

[2.**]** *(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.

Sec. 119. NAC 459.3954 is hereby amended to read as follows:

459.3954 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 , [or] 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; [or]

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) Post-administration 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.

Sec. 120. NAC 459.3956 is hereby amended to read as follows:

459.3956 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 **[**is**]** *:*

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:

[1.**]** (*a)* At least 24 hours of classroom and laboratory training that included:

[(a)**]** *(1)* Radiation physics and instrumentation;

[(b)**]** *(2)* Radiation protection;

[(c)**]** *(3)* Mathematics pertaining to the use and measuring of radioactivity; and

[(d)**]** *(4)* Radiation biology **[**;

2.**]** *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:

[(a)**]** *(1)* Examination of each person to be treated;

[(b)**]** *(2)* Calculation of the dose to be administered;

[(c)**]** *(3)* Administration of the dose; and

[(d)**]** *(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.

Sec. 121. NAC 459.3958 is hereby amended to read as follows:

459.3958 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 *,* **[**or**]** 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; **[**or**]**

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) Post-administration 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.

Sec. 122. NAC 459.396 is hereby amended to read as follows:

459.396 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; **[**or**]**

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 **[**stated**]** *set forth* in NAC 459.3864, 459.3914, 459.3917 **[**,**]** and 459.3924.

Sec. 123. NAC 459.3966 is hereby amended to read as follows:

459.3966 The training and experience specified in NAC 459.394 to 459.396, inclusive, *and sections 28 and 29 of this regulation* must have been obtained within the **[**5**]** *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.

Sec. 124. NAC 459.418 is hereby amended to read as follows:

459.418 "Coefficient of variation," abbreviated as "C," means the ratio of the standard deviation to the mean value of a population of observations. It is estimated using the following equation:

where

$\underline{s}$ = Estimated standard deviation of the population.

$\overline{X}$ = Mean value of observations in sample.

X_i = ith observation in sample.

n = Number of observations in sample.

Sec. 125. NAC 459.692 is hereby amended to read as follows:

459.692 "Radiographer" means any person who performs or provides personal supervision of **[**,**]** industrial radiographic operations and who is responsible to the licensee or registrant for ensuring compliance with the requirements of the provisions of NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* and all conditions of the license or certificate or the registration.

Sec. 126. NAC 459.704 is hereby amended to read as follows:

459.704 1. The provisions of NAC 459.680 to 459.736, inclusive, establish radiation safety requirements for persons using sources of radiation for industrial radiography. These requirements are in addition to and not in substitution for other applicable requirements of NAC 459.010 to 459.950, inclusive **[**.**]** *, and sections 2 to 30, inclusive, of this regulation.*

2. NAC 459.680 to 459.736, inclusive, apply to all licensees or registrants who use sources of radiation for industrial radiography. Except for the provisions of those sections which are clearly applicable only to sealed radioactive sources, both radiation machines and sealed radioactive sources are covered by NAC 459.680 to 459.736, inclusive.

Sec. 127. NAC 459.713 is hereby amended to read as follows:

459.713 1. **[**A**]** *Except as otherwise provided in subsections 2 and 3, a* radiographic exposure device in which a sealed source of radioactive material is used and any associated equipment must comply with the requirements set forth in the American National Standards **[**, Inc.,**]** *Institute* Standard N43.9-1991, entitled "For Gamma Radiography - Specifications, Design and Testing of Apparatus," which is hereby adopted by reference. The publication may be purchased from the American National Standards Institute, **[**Inc.,**]** 11 West 42nd Street, New York, New York 10036, for the price of **[**$43**]** *$40* per copy.

2. *Equipment that is used in industrial radiographic operation is not required to comply with paragraph 6.6.2 of the Endurance Test of the American National Standards Institute Standard N43.9-1991 if the equipment has been tested using a torque value representative of the torque value that a natural person using the equipment can actually exert on the lever or crankshaft of the drive mechanism of the equipment.*

3. An engineering analysis may be submitted by an applicant or licensee to demonstrate the applicability of a test that has been performed on similar components of radiographic equipment if the division determines, upon review, that the test is acceptable.

4. In addition to the requirements adopted pursuant to subsection 1, a radiographic exposure device and associated equipment must comply with the following requirements:

(a) A licensee who uses a radiographic exposure device shall attach to the device a durable, legible and clearly visible label that includes:

(1) The chemical symbol and mass number of the radionuclide in the device;

(2) The measurement of activity and the date on which this activity was last measured;

(3) The model number and serial number of the sealed source;

(4) The name of the manufacturer of the sealed source; and

(5) The name, address and telephone number of the licensee.

(b) A radiographic exposure device intended for use as a Type B transport container must comply with the applicable requirements adopted pursuant to NAC 459.910.

(c) A radiographic exposure device and associated equipment may not be modified in any manner.

[3.**]** *5.* In addition to the requirements adopted pursuant to subsection 1 and the requirements set forth in subsection **[**2,**]** *4,* a radiographic exposure device and any associated equipment that allow the source to be moved out of the device for routine operations must comply with the following requirements:

(a) The coupling between the source assembly and the control cable must be designed in such a manner as to prohibit:

(1) The source assembly from becoming disconnected if cranked outside the guide tube.

(2) The coupling from being unintentionally disconnected under normal and reasonably foreseeable abnormal conditions.

(b) The radiographic exposure device must automatically secure the source assembly in the fully shielded position when it is cranked back into the radiographic exposure device. The release of the source assembly from the fully shielded position must require a deliberate operation on the radiographic exposure device.

(c) The fittings for outlets, the lock box and the fittings for drive cables on a radiographic exposure device must be equipped with safety plugs and covers. The safety plugs and covers must be installed during storage and transportation to protect the source assembly from water, mud, sand or other foreign matter.

(d) Each sealed source or source assembly must have attached to it or engraved upon it a durable, legible and visible label with the words “DANGER - RADIOACTIVE.” The label must not interfere with the safe operation of the radiographic exposure device or the associated equipment.

(e) The guide tube must have passed the crushing tests for the control tube as specified in the American National Standards Institute **[**, Inc.,**]** Standard N43.9-1991, and a kinking resistance test that closely approximates the kinking forces likely to be encountered during use.

(f) A guide tube must be used when moving the source out of the radiographic exposure device.

(g) An exposure head or other similar device designed to prevent the source assembly from passing out of the end of the guide tube must be attached to the outermost end of the guide tube during radiographic operations.

(h) The connection between the guide tube and the exposure head must be able to withstand the tensile strength for control units specified in the American National Standards Institute **[**, Inc.,**]** Standard N43.9-1991.

(i) A source changer must provide a system that ensures the source will not be accidentally withdrawn from the changer when connecting or disconnecting the drive cable to or from the source assembly.

[4.**]** *6.* The provisions of this section apply to:

(a) Any radiographic exposure device and associated equipment that is manufactured on or after January 21, 1994; and

(b) Any radiographic exposure device and associated equipment that is used after January 10, 1996.

Sec. 128. NAC 459.7225 is hereby amended to read as follows:

459.7225 1. A person who wishes to take the examination to perform industrial radiography for a licensee or registrant must apply to the division on a form prescribed and furnished by the division. The application must be accompanied by a nonrefundable fee in an amount equal to the division's cost of administering the examination and must be received by the division at least 20 working days before the announced date of the examination.

2. A person whose identification card issued by the division has been suspended or revoked must obtain written approval from the division before applying to retake the examination.

3. The examination to perform industrial radiography for a licensee or registrant will be held at such times and places as are determined by the division. The division shall determine the scope of the examination, the methods by which it is administered and the passing grade. The examination must test the applicant's knowledge to use safely sources of radiation and related equipment in the practice of industrial radiography and his knowledge and ability to comply with the appropriate regulations of the division. All answers to the examination must be written in English.

4. An applicant may not be allowed to take the examination unless he presents an identification card with his picture on the card at the time of the examination.

5. A representative of the division shall proctor the examination and may terminate the examination of any person he believes is cheating.

6. The names and scores of persons taking the examination are public records.

7. The division shall issue to a person who passes the examination an identification card that is valid for 3 years. The identification card shall be deemed valid when the person to whom it is issued has his picture placed on the card at an office of the department of motor vehicles and public safety. A violation of any provision of NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation* is a

ground for the suspension or revocation of an identification card issued pursuant to this subsection.

Sec. 129. NAC 459.724 is hereby amended to read as follows:

459.724 1. **[**A licensee's or registrant's**]** *The* operating and emergency procedures *of a licensee or registrant* must include *, without limitation,* instructions in *:* **[**at least the following:**]**

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

(b) Methods and occasions for conducting radiation surveys;

(c) Methods for controlling access to radiographic areas;

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

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

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

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

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

(i) The maintenance of records; and

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

2. Except as otherwise provided in this subsection, a licensee or registrant shall not permit any person to act as a radiographer or as a radiographer's assistant unless, at all times during radiographic operations, the person wears a direct reading pocket dosimeter, an alarm rate meter **[**,**]** and either a film badge or a thermoluminescent dosimeter. An alarm rate meter is not required to be worn for shielded-room radiography if other appropriate alarm or warning devices are used. Pocket dosimeters must have a range from zero to 200 milliroentgens and be recharged daily or at the start of each shift. Each film badge or thermoluminescent dosimeter must be assigned to and worn by only one person **[**.**]** *and must not be replaced less often than once a month.*

3. Pocket dosimeters must be read and exposures recorded daily. A person's film badge or thermoluminescent dosimeter must be immediately processed if his pocket dosimeter is discharged beyond its range. Reports received from the film badge or thermoluminescent dosimeter processor and records of the pocket dosimeter readings must be maintained for inspection by the division until it authorizes their disposal.

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

5. Each alarm rate meter must:

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

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

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

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

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

6. A licensee or registrant shall provide periodic training for radiographers and radiographer's assistants at least once each calendar year.

Sec. 130. NAC 459.740 is hereby amended to read as follows:

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

2. In addition to the requirements of NAC 459.740 to 459.752, inclusive, all registrants are subject to the requirements of NAC 459.010 to 459.166, inclusive, *and sections 2 to 16, inclusive, of this regulation,* 459.320 to 459.374, inclusive, and 459.780 to 459.794, inclusive. Registrants engaged in industrial radiographic operations are subject to the requirements of NAC 459.680 to 459.736, inclusive, and registrants engaged in the healing arts are subject to the requirements of NAC 459.400 to 459.624, inclusive. Registrants engaged in the production of radioactive material are subject to the requirements of NAC 459.180 to 459.314, inclusive **[**.**]** *, and sections 17 to 23, inclusive, of this regulation.*

Sec. 131. NAC 459.742 is hereby amended to read as follows:

459.742 1. No person may receive, possess, use, transfer, own or acquire a particle accelerator except as authorized in a registration issued pursuant to NAC 459.010 to 459.950, inclusive, *and sections 2 to 30, inclusive, of this regulation,* or as otherwise provided for in those sections. The general procedures for registration of particle accelerator facilities are included in NAC 459.150 to **[**459.168,**]** *459.166,* inclusive.

2. In addition to the requirements of NAC 459.150 to **[**459.168,**]** *459.166,* inclusive, a registration application for use of a particle accelerator may be approved only if the division determines that:

(a) The applicant is qualified by reason of training and experience to use the accelerator in question for the purpose requested in accordance with NAC 459.320 to 459.374, inclusive, 459.740 to 459.752, inclusive, and 459.780 to 459.794, inclusive, in such a manner as to minimize danger to public health and safety or property;

(b) The applicant's proposed or existing equipment, facilities, operating and emergency procedures are adequate to protect health and minimize danger to public health and safety or property;

(c) The issuance of the registration will not be inimical to the health and safety of the public and the applicant satisfies any applicable special requirement in subsection 3;

(d) The applicant has appointed a safety officer in radiation;

(e) The applicant or the applicant's staff has substantial experience in the use of particle accelerators and training sufficient for application to its intended uses;

(f) The applicant has established a safety committee in radiation to approve, in advance, proposals for uses of the particle accelerator, whenever deemed necessary by the division; and

(g) The applicant has an adequate training program for operators of the particle accelerator.

3. In addition to the requirements in NAC 459.150 to **[**459.168,**]** *459.166,* inclusive, a registration for use of a particle accelerator in the healing arts will be issued only if the following requirements are met:

(a) The applicant has appointed a medical committee of at least three members to evaluate all proposals for research, diagnostic and therapeutic use of the particle accelerator whenever deemed necessary by the division. Membership of the committee should include physicians expert in internal medicine, hematology, therapeutic radiology and a person experienced in depth dose calculations and protection against radiation.

(b) The persons designated on the application as the users have substantial training and experience in deep therapy techniques or in the use of particle accelerators to treat humans.

(c) Any person designated on the application as the user is a physician.

Sec. 132. NAC 459.7635 is hereby amended to read as follows:

459.7635 The provisions of NAC 459.756 to 459.7745, inclusive:

1. Establish radiation safety requirements for persons using sources of radiation for well logging which are in addition to and not in substitution for other applicable

requirements of NAC 459.010 to 459.950, inclusive **[**;**]** *, and sections 2 to 30, inclusive, of this regulation;*

2. Apply to all licensees or registrants who use sources of radiation for well logging; and

3. Apply to both radiation machines and radioactive materials unless the context otherwise requires.

Sec. 133. NAC 459.7701 is hereby amended to read as follows:

459.7701 1. A licensee shall not permit a person to act as a logging supervisor until that person:

(a) Has completed training in the subjects set forth in NAC 459.7705.

(b) Has received copies of, and instruction in:

(1) The regulations contained in NAC 459.010 to 459.950, inclusive **[**;**]** *, and sections 2 to 30, inclusive, of this regulation;*

(2) The division license under which the logging supervisor will perform well logging; and

(3) The licensee's operating and emergency procedures required by NAC 459.7715.

(c) Has completed on-the-job training and demonstrated his competence, in a field evaluation, in the use of:

(1) Radioactive materials;

(2) Remote handling tools; and

(3) Radiation survey instruments.

(d) Has demonstrated his understanding of the requirements of paragraphs (a) and (b) of subsection 1, by successfully completing a written test.

2. A licensee shall not permit a person to act as a logging assistant until that person:

(a) Has received instruction in the regulations contained in NAC 459.010 to 459.950, inclusive **[**;**]** *, and sections 2 to 30, inclusive, of this regulation;*

(b) Has received copies of, and instruction in *,* the licensee's operating and emergency procedures required by NAC 459.7715;

(c) Has demonstrated his understanding of the materials listed in paragraphs (a) and (b) of this subsection by successfully completing a written or oral test; and

(d) Has received instruction appropriate for his job responsibilities in the use of:

(1) Radioactive materials;

(2) Remote handling tools; and

(3) Radiation survey instruments.

3. A licensee shall provide a safety review for logging supervisors and logging assistants at least once during each calendar year.

4. A licensee shall maintain a record of the training and safety review provided each logging supervisor and logging assistant. The records of training must include copies of written tests and dates of oral tests. The records of training must be retained for 3 years after the termination of employment of the supervisor or assistant. Records of the annual safety reviews must list the topics discussed and be retained for 3 years.

Sec. 134. NAC 459.7745 is hereby amended to read as follows:

459.7745 1. Each licensee and registrant shall maintain the following documents and records at the field station:

(a) The regulations contained in NAC 459.010 to 459.950, inclusive **[**;**]** *, and sections 2 to 30, inclusive, of this regulation;*

(b) The license or registration authorizing the use of a source of radiation;

(c) The records of calibration of radiation survey instruments;

(d) Operating and emergency procedures;

(e) The records of leak tests;

(f) Physical inventory records;

(g) Utilization records;

(h) Records of inspection and maintenance;

(i) Training records; and

(j) Survey records.

2. Each licensee and registrant shall maintain the following documents and records at a temporary jobsite while well logging operations are being conducted:

(a) Operating and emergency procedures;

(b) Evidence of the latest calibration of the radiation survey instruments in use at the site;

(c) The latest survey records required by NAC 459.7725;

(d) The shipping papers for transportation of radioactive material;

(e) The latest leak test record;

(f) A copy of the license or registration authorizing the use of a source of radiation; and

(g) Identification documents for each person who enters the restricted area at the site which indicates his classification as logging supervisor, logging assistant or other category, and states that he is an employee of the licensee or registrant.

Sec. 135. NAC 459.784 is hereby amended to read as follows:

459.784 *1.* All persons **[**working in or frequenting any portion of a restricted area must:

1.**]** *who in the course of employment are likely to receive in 1 year an occupational dose of more than 100 millirems must:*

(a) Be informed of the storage, transfer or use of radioactive material or of radiation *;* **[**in that portion;

2.**]** *(b)* Be instructed in the problems of health protection associated with exposure to such radioactive material or radiation;

[3.**]** *(c)* Be instructed in precautions or procedures to minimize exposure and in the purposes and functions of the protective devices which are provided;

[4. Be informed of and**]**

(d) Be instructed *in and required* to comply with the provisions of NAC 459.010 to 459.794, inclusive, *and sections 2 to 29, inclusive, of this regulation* and licenses which

pertain to the protection of personnel from any exposures to radiation or radioactive materials [occurring in those areas;

5.] *;*

(e) Be informed of their responsibility to report promptly to the licensee or registrant any condition which may cause or lead to a violation of NAC 459.010 to 459.794, inclusive, *and sections 2 to 29, inclusive, of this regulation,* or licenses or any unnecessary exposure to radiation or radioactive material;

[6.] *(f)* Be instructed in the appropriate response to warnings made in the event of any unusual occurrence or malfunction that may involve exposure to radiation or radioactive material; *and*

[7.] *(g)* Be advised of the existence of exposure reports to radiation which workers may request pursuant to NAC 459.786 . [; and

8. To the extent necessary, be instructed regarding the gravity of problems concerning radiological health protection in the restricted area.]

2. In determining which persons are subject to the requirements of this section, licensees shall consider:

(a) The assigned activities of the person during normal and abnormal situations involving exposure to radiation or radioactive material that can reasonably be expected to occur during the life of the licensed facility; and

(b) The potential problems relating to the protection against radiation and radioactive material present in the licensed facility.

Sec. 136. NAC 459.800 is hereby amended to read as follows:

459.800 As used in NAC 459.800 to 459.950, inclusive, *and section 30 of this regulation,* unless the context otherwise requires, the words and terms defined in NAC 459.8005 to 459.8055, inclusive, have the meanings ascribed to them in those sections.

Sec. 137. NAC 459.8165 is hereby amended to read as follows:

459.8165 1. After receipt and acceptance of a shipment of radioactive waste, the licensee shall record:

(a) The date of receipt and the condition of the packages of waste as received **[**;**]** *at the disposal facility;*

(b) Any discrepancies between the materials listed on the manifest and those received;

(c) Any evidence of leaking or damaged packages or radiation, or levels of contamination in excess of the limits specified in the regulations of the United States Department of Transportation and the division; **[**and**]**

(d) *The traceable shipment manifest number;*

(e) A description of any engineered barrier or structural overpack provided for disposal of the waste;

(f) The volume of any pallets, bracing or other shipping or on-site generated materials that are contaminated and are disposed of as contaminated or suspect materials;

(g) The date of disposal of the waste and its location in the disposal area **[**.**]** *; and*

(h) Any other information that may be required by the division as a condition of the license.

2. *The licensee shall retain the records described in subsection 1 until the division transfers or terminates the license that authorizes the activities described in this section.*

3. The licensee shall briefly describe any repackaging performed on the waste included in the shipment and any other information required to be kept by the division.

4. The licensee shall store, or have stored, the manifest and any other information relating to the receipt and disposal of radioactive waste in a medium that is computer readable, including, without limitation, the information described in:

(a) Paragraphs (a) to (d), inclusive, of subsection 1;

(b) Subsection 3; and

(c) Section 30 of this regulation, except for:

(1) The telephone numbers of the persons shipping and carrying the waste; and

(2) The certifications of the consignee and the shipper of the waste.

5. As used in this section:

(a) "Engineered barrier" means a man-made structure or device that is used to improve the ability of the disposal facility to meet the requirements set forth in NAC 459.810.

(b) "Medium that is computer readable" means a medium from which information can be transferred into the memory of the computer of the division.

(c) "Structural overpack" means an enclosure that is used by a single consignor to protect a package of waste, for convenience in the handling of such a package or to consolidate two or more such packages. The term does not include a vehicle used for transportation or a freight container.

Sec. 138. NAC 459.818 is hereby amended to read as follows:

459.818 1. Each licensee shall permit the division at all reasonable times to inspect radioactive waste not yet disposed of and the premises, equipment, operations and facilities in which radioactive wastes are received, possessed, handled, treated, stored and disposed of, unless the licensee has a record of satisfactory compliance with the regulations of the United States Department of Transportation, as determined by the division.

2. Each licensee shall make available to the division for inspection, upon reasonable notice, records kept by it pursuant to the provisions of NAC 459.3665 and 459.800 to 459.8225, inclusive. An authorized representative of the division may copy for the division's use any record required to be kept pursuant to the provisions of NAC 459.010 to 459.950, inclusive **[**.**]** *, and sections 2 to 30, inclusive, of this regulation.*

Sec. 139. NAC 459.8235 is hereby amended to read as follows:

459.8235 1. Any licensee who **[**generates or**]** transfers radioactive waste to a *land* disposal **[**area**]** *facility* or to a **[**broker who collects prepackaged waste for shipment**]** *licensed waste collector* shall comply with all **[**of**]** the requirements of this section. Any licensee who **[**generates and**]** transfers waste to a **[**broker**]** *licensed waste processor* for

processing, treatment or repackaging **[**before shipment**]** shall comply with the requirements of paragraphs (d) to (h), inclusive, of subsection 2.

2. A licensee shall:

(a) Prepare all wastes so that they are in compliance with the permitted classes of waste *set forth in NAC 459.8265 and 459.830* and meet the requirements for **[**physical form and packaging;**]** *stability set forth in NAC 459.8305;*

(b) Label each **[**package of waste**]** *disposal container or transport package* to identify whether it **[**is**]** *contains* Class A, Class B or Class C waste **[**;**]** *, as set forth in NAC 459.8265 and 459.827;*

(c) Conduct a program of inspection, including managerial evaluation of audits, to ensure that the wastes conform to permitted classes and the requirements for physical form and packaging;

(d) Prepare **[**shipping manifests which contain**]** *the NRC uniform low-level radioactive waste manifest that contains* the required information and certifications;

(e) Forward *or electronically transfer* a copy of the *NRC uniform low-level radioactive waste* manifest to the intended **[**recipient at the time of shipment, or deliver it to a broker at the time the waste is collected,**]** *consignee so that the receipt of the manifest precedes the shipment or so that the manifest is delivered to the consignee with the waste at the time the waste is transferred to the consignee* and obtain acknowledgment of receipt **[**from the broker or other recipient**]** *of the shipment by the consignee* in the form of a signed copy of **[**the manifest;**]** *NRC Form 540;*

(f) Include **[**a copy of the manifest**]** *NRC Form 540 or NRC Form 540A, as applicable,* with the shipment;

(g) Retain *or electronically store* a copy of the **[**manifest with**]** *uniform low-level radioactive waste manifest and documentation of the* acknowledgment of receipt as the required record of transfer of the licensed material; and

(h) **[**If any**]** *For a* shipment or part of a shipment **[**has been accepted by a broker or a disposal area without returning**]** *for which* an acknowledgment of its receipt *has not been received* within 20 days after the shipping date, conduct the **[**required investigation.**]** *investigation required pursuant to NAC 459.8255.*

Sec. 140. NAC 459.824 is hereby amended to read as follows:

459.824 **[**Any broker**]** *A waste collector* who collects and handles only prepackaged waste shall:

1. Acknowledge receipt of the waste from the **[**licensee who generated it**]** *shipper* by returning a signed copy of **[**the manifest**]** *NRC Form 540* within 1 week after receiving the waste.

2. Prepare a new shipping manifest to reflect consolidated shipments **[**which contains a listing or index of the details in the original manifests. Copies of the original manifests must be a part of the new manifest unless the new manifest contains all the required information for each package. The broker shall certify that nothing has been done to the waste which would invalidate the certifications of the licensees who generated the waste.

3. Forward a copy of the new manifest to the operator of the disposal area at the time of shipment.

4. Include the new manifest with the shipment to the disposal area.

5. Retain a copy of the manifest with documentation of acknowledgment of receipt as the required record of transfer of licensed material, and retain information from the original manifests until disposition is authorized by the division.

6. If any shipment or part of a shipment has been accepted by a broker or a disposal area without acknowledgment of its receipt within 20 days after the shipping date, conduct the required investigation.**]** *that meets the requirements of section 30 of this regulation. The waste collector shall ensure that for each container of waste in the shipment NRC Form 540 identifies the generator of that container of waste.*

3. Comply with the provisions of paragraphs (e) to (h), inclusive, of subsection 2 of NAC 459.8235.

4. Notify the shipper when any shipment or part of a shipment has not arrived within 60 days after receipt of an advanced manifest unless the waste collector is notified by the shipper that the shipment has been canceled.

Sec. 141. NAC 459.8245 is hereby amended to read as follows:

459.8245 **[**Any broker**]** *A waste processor* who processes, treats or repackages wastes shall:

1. Acknowledge receipt of the waste from the **[**licensee who generated it**]** *shipper* by returning a signed copy of **[**the manifest**]** *NRC Form 540* within 1 week after receipt of the waste . **[**;**]**

2. Prepare a new shipping manifest which contains the required information and certificate, the preparation of which is acknowledgment that the **[**broker-processor**]** *waste processor* is responsible for the waste . **[**;**]** *For each container of waste in the shipment, the manifest must set forth the waste generator, the volume of preprocessed waste and any other information required pursuant to section 30 of this regulation.*

3. Prepare all wastes so that **[**they are in compliance with the permitted classes of waste and meet the requirements for physical form and packaging;**]** *the waste is classified according to NAC 459.8265 and meets the requirements of NAC 459.830 and 459.8305.*

4. Label each package of waste to identify whether it is Class A, Class B or Class C waste **[**;**]** *in accordance with NAC 459.8265.*

5. Conduct a program of inspection, including *a* managerial evaluation of audits, to ensure that the waste conforms to permitted classes and the requirements for physical form and packaging . **[**;**]**

6. Forward *or electronically transfer* a copy of the **[**new manifest to the operator of the disposal area, or deliver it to a broker at the time the waste is collected, and**]** *uniform low-level radioactive waste manifest to the consignee so that the manifest is received before or at the same time the shipment is delivered to the consignee. The*

waste processor shall obtain acknowledgment of receipt **[**from the operator or broker**]** in the form of a copy of **[**the manifest**]** *NRC Form 540* signed by the **[**broker or operator;

7. Include the new manifest**]** *consignee.*

7. Include NRC Form 540 or Form 540A, as applicable, with the shipment . **[**;**]**

8. Retain **[**copies of original manifests and new manifests with**]** *or electronically store a copy of the uniform low-level radioactive waste manifest and* documentation of acknowledgment of receipt as the required record of transfer of licensed material . **[**; and

9. If**]**

9. For any shipment or part of a shipment **[**has been accepted by a broker or a disposal area without**]** *for which an* acknowledgment of its receipt *has not been received* within 20 days after the shipping date, conduct the **[**required investigation.**]** *investigation required by NAC 459.8255.*

10. Notify the shipper when any shipment or part of a shipment has not arrived within 60 days after receipt of an advanced manifest, unless the waste processor is notified by the shipper that the shipment has been canceled.

Sec. 142. NAC 459.826 is hereby amended to read as follows:

459.826 An operator of a *land* disposal **[**area**]** *facility* shall:

1. Acknowledge receipt of the waste within 1 week after its receipt by returning a signed copy of **[**the shipping manifest**]** *NRC Form 540* to the shipper. The shipper to be

notified is the licensee who last possessed the waste and transferred the waste to the operator. The returned copy **[**of the manifest**]** *or electronic copy of NRC Form 540* must indicate any discrepancies between materials listed on **[**the manifest**]** *NRC Form 540* and materials received.

2. Maintain copies of all completed manifests *and electronically store the information required pursuant to NAC 459.8165* until the division authorizes their disposition.

3. Notify the shipper and the division when any shipment or part of a shipment has not arrived within **[**30**]** *60* days after receipt of an advance manifest **[**.**]** *, unless the operator of the land disposal facility is notified by the shipper that the shipment has been canceled.*

4. Notify the division within 5 days after receipt of a shipment of any discrepancies between *the* materials listed on **[**the manifest and**]** *NRC Form 540 and the* materials received.

Sec. 143. NAC 459.830 is hereby amended to read as follows:

459.830 1. The minimum requirements for physical form and packaging for all classes of waste are as follows:

(a) Radioactive wastes must be packaged in conformance with the conditions of the license issued to the operator of the disposal area to which the waste will be shipped, and if the conditions in the license for disposal are more restrictive than the provisions of

NAC [459.823] *459.8235* to 459.8305, inclusive, *and section 30 of this regulation,* the conditions in the license must govern;

(b) Wastes must not be packaged for disposal in cardboard or fiberboard boxes;

(c) Liquid waste must be packaged in absorbent material sufficient to absorb twice the volume of the liquid;

(d) Solid waste containing a liquid must contain as little free standing, noncorrosive liquid as is reasonably achievable, but in no case may the amount of the liquid exceed 1 percent of the volume;

(e) Waste must not be readily capable of detonation or of explosive decomposition or reaction at normal pressures and temperatures or capable of explosive reaction with water;

(f) Waste must not contain or be capable of generating quantities of toxic gases, vapors or fumes which are harmful to persons transporting, handling or disposing of the waste, except for radioactive gaseous waste which is packaged in accordance with the provisions of paragraph (h);

(g) Waste must not be pyrophoric unless the pyrophoric materials contained in the waste are treated, prepared and packaged to be nonflammable;

(h) Waste in a gaseous form must be packaged at a pressure that does not exceed 1.5 atmospheres at 20°C and an amount of activity that does not exceed 100 curies per container;

(i) Waste containing hazardous, biological, pathogenic or infectious material must be treated to reduce to the maximum extent practicable the potential hazard from the nonradiological materials; and

(j) Waste containing radium 226 must be in the form of a sealed source and packaged in a specification 2 R inside containment vessel or its equivalent before it can be accepted for disposal at the state-owned disposal area.

2. As used in this section, "pyrophoric" means capable of spontaneous ignition **[**,**]** and includes any:

(a) Liquid that ignites spontaneously in dry or moist air at or below 130°F (54.5°C).

(b) Solid material, other than one classed as an explosive, which under normal conditions may cause a fire through friction or heat retained from manufacturing or processing, or which can be readily ignited and when ignited burns so vigorously and persistently as to create a serious hazard to persons or property while being transported, handled or disposed of. Pyrophoric solid materials include spontaneously combustible and water-reactive materials.

Sec. 144. NAC 459.823 is hereby repealed.

TEXT OF REPEALED SECTION

459.823 Shipping manifest.

1. Each shipment of radioactive waste to a licensed broker or disposal area must be accompanied by a shipping manifest that contains the name, address and telephone number of both the person generating the waste and the person transporting the waste to the broker or disposal area.

2. The manifest must contain a statement which is as complete as is practicable and includes a physical description of the waste, its volume, the identity and quantity of radionuclides, the total radioactivity and the principal chemical form. Any agent used for solidification of the waste must be specified.

3. Wastes containing more than 0.1 percent by weight of chelating agents must be identified and the percentage by weight of the chelating agent must be estimated.

4. The classification of the wastes as Class A, Class B or Class C must be clearly stated in the manifest.

5. The total quantity of the radionuclides H-3, C-14, Tc-99 and I-129 must be shown.

6. The manifest required by this section may be shipping papers which comply with the regulations of the United States Department of Transportation or Environmental Protection Agency or which fulfill the requirements of the recipient, as long as all the required information is included.

7. The manifest must include a certificate by the generator of the waste or broker who processes, treats or repackages it that the transported materials are properly classified, described, packaged, marked and labeled and are in proper condition for transporting according to the applicable regulations of the United States Department of Transportation and the division.

8. An authorized representative of the generator or broker shall sign and date the manifest.