PROPOSED REGULATION OF

THE STATE BOARD OF HEALTH

LCB File No. R084-98

July 20, 1998

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

AUTHORITY: §§ 2-90, NRS 459.030.

Section 1. Chapter 459 of NAC is hereby amended by adding thereto the provisions set forth as sections 2 to 29, inclusive, of this regulation.

Sec. 2. *"Authorized nuclear pharmacist" means a pharmacist who is:*

1. Certified as a nuclear pharmacist by the Board of Pharmaceutical Specialties; or

2. Identified as an authorized nuclear pharmacist on a license or permit which authorizes the use of radioactive material in the practice of nuclear pharmacy and is issued by:

(a) The division;

(b) The Nuclear Regulatory Commission; or

(c) An agreement state.

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. The term does not include a facility:*

1. That operates pursuant to a license issued by the Nuclear Regulatory Commission or an agreement state; and

2. Whose principal purpose is decontamination of equipment or materials for the purpose of waste management, including, without limitation, the recycling and reusing of the waste.

Sec. 5. *"Disposal container" means a container that is used to confine low-level radioactive waste for disposal at a 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. *"Physical description" means the items required on NRC Form 541 to describe low-level radioactive waste.*

Sec. 9. *"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. 10. *"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. 11. *"Uniform manifest" means the combination of NRC Forms 540, 541 and 542, and continuation sheets, as applicable.*

Sec. 12. *"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. 13. *"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. 14. *"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. 15. *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. 16. *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. 17. *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 Information and Records Management Branch, Office of Information Resources Management, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555, telephone (301) 415-7232.*

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. 18. *A licensee shall:*

1. Provide to the division within 30 days after a person employed by the licensee is permitted to work as an authorized user a copy of the certification, license or permit issued to the authorized user by the state board of health, state board of pharmacy, the division, the Nuclear Regulatory Commission or an agreement state.

2. Notify the division in writing within 30 days after:

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

(b) The mailing address of the licensee is changed.

Sec. 19. *A licensee with a type A specific license of broad scope for medical use is exempt from the provisions of:*

1. Subsection 2 of NAC 459.381;

2. Paragraphs (a) and (b) of subsection 5 of NAC 459.381;

3. Subsection 1 of section 18 of this regulation; and

4. Paragraph (a) of subsection 2 of section 18 of this regulation.

Sec. 20. *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 manufacture, produce, acquire, receive, possess, use or transfer radioactive material for medical use under the supervision of an authorized user as set forth in section 21 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 21 of this regulation; or

(b) An authorized nuclear pharmacist as set forth in section 22 of this regulation.

Sec. 21. *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 29, 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 29, 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. 22. *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 29, 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. 23. *An authorized user or an authorized nuclear pharmacist who supervises a person pursuant to sections 21 or 22 of this regulation, as applicable, is responsible for the acts and omissions of the person that occur within the scope of the activity being supervised.*

Sec. 24. *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. 25. *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. 26. *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. 27. *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 26 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; or

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.

Sec. 28. *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; or

(b) Has completed 700 hours in a structured educational program consisting of both:

(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.

(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; and

(V) Using procedures to prevent or minimize contamination; and

(VI) Using procedures for decontamination.

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 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. 29. *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 reflecting 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 consignee, NRC Forms 541, 541A, 542 and 542A may be completed, transmitted and stored in electronic media with the capability for 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 EPA 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 the 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 source and devices and wastes in solidification 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 is shipping 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 the 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 or 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 agents for any disposal container containing more than 0.1 percent by weight of the chelating agents 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 names 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 EPA 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 to 261, inclusive, as those provisions existed on the effective date of this regulation. The required EPA 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. 30. 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 29, 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 14, inclusive, of this regulation,* have the meanings ascribed to them in those sections.

Sec. 31. NAC 459.0208 is hereby amended to read as follows:

459.0208 "Authorized user" means a physician *, dentist or podiatrist* who is **[**identified**]** *:*

1. Identified as an authorized user on a license *, certification or permit* issued by the **[**State of Nevada,**]** *the division,* the Nuclear Regulatory Commission or an agreement state that authorizes the *medical* use of radioactive **[**materials in medical procedures.**]** *material; or*

2. Certified by the:

(a) American Board of Nuclear Medicine;

(b) American Board of Radiology;

(c) American Osteopathic Board of Nuclear Medicine;

(d) American Osteopathic Board of Radiology; or

(e) Royal College of Physicians and Surgeons of Canada,

pursuant to the provisions of section 27 of this regulation or NAC 459.3944, 459.3946, 459.3948, 459.3954 or 459.3958.

Sec. 32. 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**]** *any person except* a person during any period in which that person receives an occupational dose.

Sec. 33. 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**]** *person* other than the patient 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**]** *person* other than the patient 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**]** *person* other than the patient 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**]** *person* other than the patient 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**]** *person* other than the patient 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**]** *a person* exceeds 5 rems, or the dose equivalent to any organ exceeds 50 rems, and:

(a) The administration is:

(1) To a **[**patient**]** *person* other than the patient 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. 34. NAC 459.054 is hereby amended to read as follows:

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

1. In a restricted area; or

2. In**]** *in* the course of employment in which the 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 from background radiation, medical use of radioactive material, voluntary participation in medical research or as a member of the public.*

Sec. 35. 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 from background radiation, medical use of radioactive material or voluntary participation in medical research.*

Sec. 36. 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. 37. 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}
[Iradium**]**	Ir 190		2×10^{-3}
Iridium (77)	Ir 92		4×10^{-4}
	Ir 94		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}

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}
	Mn 56		1×10^{-3}
Mercury (80)	Hg 197m		2×10^{-3}
	Hg 197		3×10^{-3}
	Hg 203		2×10^{-4}
Molybdenum (42)	Mo 99		2×10^{-3}
Neodymium (60)	Nd 147		6×10^{-4}
	Nd 149		3×10^{-3}
Nickel (28)	Ni 65		1×10^{-3}
Niobium			
(Columbium) (41)	Nb 95		1×10^{-3}
	Nb 97		9×10^{-3}
Osmium (76)	Os 185		7×10^{-4}
	Os 191m		3×10^{-2}
	Os 191		2×10^{-3}
	Os 193		6×10^{-4}
Palladium (46)	Pd 103		3×10^{-3}
	Pd 109		9×10^{-4}
Phosphorus (15)	P 32		2×10^{-4}
Platinum (78)	Pt 191		1×10^{-3}
	Pt 193m		1×10^{-2}
	Pt 197m		1×10^{-2}
	Pt 197		1×10^{-3}

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}
Potassium (19)	K 42		3×10^{-3}
Praseodymium (59)	Pr 142		3×10^{-4}
	Pr 143		5×10^{-4}
Promethium (61)	Pm 147		2×10^{-3}
	Pm 149		4×10^{-4}
Rhenium (75)	Re 183		6×10^{-3}
	Re 186		9×10^{-4}
	Re 188		6×10^{-4}
Rhodium (45)	Rh 103m		1×10^{-1}
	Rh 105		1×10^{-3}
Rubidium (37)	Rb 86		7×10^{-4}
Ruthenium (44)	Ru 97		4×10^{-3}
	Ru 103		8×10^{-4}
	Ru 105		1×10^{-3}
	Ru 106		1×10^{-4}
Samarium (62)	Sm 153		8×10^{-4}
Scandium (21)	Sc 46		4×10^{-4}
	Sc 47		9×10^{-4}
	Sc 48		3×10^{-4}
Selenium (34)	Se 75		3×10^{-3}
Silicon (14)	Si 31		9×10^{-3}

Element (atomic number)	Isotope	Column I Gas concentration µCi/ml[1]	Column II Liquid and solid concentration µCi/ml[2]
Silver (47)	Ag 105		1×10^{-3}
	Ag 110m		3×10^{-4}
	Ag 111		4×10^{-4}
Sodium (11)	Na 24		2×10^{-3}
Strontium (38)	Sr 85		1×10^{-3}
	Sr 89		1×10^{-4}
	Sr 91		7×10^{-4}
	Sr 92		7×10^{-4}
Sulfur (16)	S 35	9×10^{-8}	6×10^{-4}
Tantalum (73)	Ta 182		4×10^{-4}
Technetium (43)	Tc 96m		1×10^{-1}
	Tc 96		1×10^{-3}
Tin (50)	Sn 113		9×10^{-4}
	Sn 125		2×10^{-4}
Tungsten (Wolfram) (74)	W 181		4×10^{-3}
	W 187		7×10^{-4}
Vanadium (23)	V 48		3×10^{-4}
Xenon (54)	Xe 131m	4×10^{-6}	
	Xe 133	3×10^{-6}	
	Xe 135	1×10^{-6}	
Ytterbium (70)	Yb 175		1×10^{-3}
Yttrium (39)	Y 90		2×10^{-4}
	Y 91m		3×10^{-2}

Tellurium (52)	Te 125m	2×10^{-3}		Y 91	3×10^{-4}
	Te 127m	6×10^{-4}		Y 92	6×10^{-4}
	Te 127	3×10^{-3}		Y 93	3×10^{-4}
	Te 129m	3×10^{-4}	Zinc (30)	Zn 65	1×10^{-3}
	Te 131m	6×10^{-4}		Zn 69m	7×10^{-4}
	Te 132	3×10^{-4}		Zn 69	2×10^{-2}
Terbium (65)	Tb 160	4×10^{-4}	Zirconium (40)	Zr 95	6×10^{-4}
Thallium (81)	Tl 200	4×10^{-3}		Zr 97	2×10^{-4}
	Tl 201	3×10^{-3}	Beta, gamma, or both,		
	Tl 202	1×10^{-3}	emitting radioactive		
	Tl 204	1×10^{-3}	material not listed		
Thulium (69)	Tm 170	5×10^{-4}	above with a half-		
	Tm 171	5×10^{-3}	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:

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

=

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. 38. 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 8.

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, 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 of 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 at least six times the current cost estimates for decommissioning or, if certification is used, a tangible net worth of not less $10 million; 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

(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 Rating 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, a tangible net worth of at least $10 million; 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, without limitation, an appropriate state or federal agency or an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a federal or state agency.

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

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

(b) Assets located in the United States that amount to at least 90 percent of its total assets or at least 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 Rating 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 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 licensee or parent company, as applicable, 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 Rating 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 Rating 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. 39. NAC 459.200 is hereby amended to read as follows:

459.200 1. Except as otherwise provided in subsection **[**5**]** *2* and in NAC 459.202, **[**each**]** *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 that time, 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 expiration of his license pursuant to subsection 1 or 2;

(b) 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;

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

(d) 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. Following approval of 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, without limitation:

(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 10.

9. Except as otherwise provided in subsection 10, 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.

10. 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 groundwater, 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.

11. 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, without limitation:

(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.

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

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

12. A specific license, including, without limitation, 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. 40. 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. 41. 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 by the division not later than the **[**date on which**]** *last day of the month during which* the license expires. 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. 42. 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 29, 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**]** *specific license* to specified installations or locations . **[**;**]**

(b) The out-of-state licensee notifies the division in writing at least 3 *business* days **[**prior to**]** *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 should 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 job site 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. 43. 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. 44. 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 equivalent requirements for an agreement state; or

(b) Prepared by:

(1) An authorized nuclear pharmacist;

(2) A physician who is an authorized user and meets the requirements of NAC 459.3946; or

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

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. 45. 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) A physician who is an authorized user and meets the requirements of 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. 46. 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) A physician who is an authorized user and 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. 47. 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. 48. 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. 49. 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. 50. 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. 51. 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 as a drug manufacturer;

(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 22 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 28 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. 52. 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 the delivery to a carrier for transport, each package is properly closed for transport; and

(c) Prior to 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. 53. 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 person, including *, without limitation,* 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 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 to radiation for the purpose of medical **[**diagnosis or therapy**]** *use* or the intentional exposure of 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. 54. 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. 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,**]** *20401,* for the price of **[**$29.**]** *$39.*

Sec. 55. 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:

(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. 56. 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 **[**459.823**]** *459.8235* to 459.950, inclusive *,* **[**;**]** *and section 29 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. 57. 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. 58. 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 *, without limitation,* multiples and subdivisions thereof, to prepare the records required by NAC 459.010 to 459.950, inclusive, *and sections 2 to 29, 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 29, 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 29, 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 29 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. 59. 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. 60. 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. 61. 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 **[**.**]** *except for a person who is:*

(a) An authorized user certified by the:

(1) American Board of Nuclear Medicine;

(2) American Board of Radiology;

(3) American Osteopathic Board of Nuclear Medicine;

(4) American Osteopathic Board of Radiology; or

(5) Royal College of Physicians and Surgeons of Canada;

(b) An authorized nuclear pharmacist certified by the Board of Pharmaceutical Specialties; or

(c) Identified as an authorized user or an authorized nuclear pharmacist on a license or permit that authorizes the use of radioactive material for medical use or the practice of nuclear pharmacy and was issued by:

(1) The Nuclear Regulatory Commission; or

(2) An agreement state.

2. Permits any person to work as an authorized user under the license.

3. Changes radiation safety officers or teletherapy physicists.

4. 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. Adds to or changes:

(a) Any address of use;

(b) Any area of use; or

(c) Any restricted area.

Sec. 62. 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 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. 63. 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. 64. 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**]** *2000* 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 **[**:**]** *, without limitation:*

(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. 65. 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 **[**:**]** *, without limitation:*

(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 radiation safety guidance 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**]** *2000* 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. 66. 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 **[**:**]** *, without limitation:*

(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. 67. 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 **[**:**]** *, without limitation:*

(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. 68. 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. 69. 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 **[**.**]** *when 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 **[**:**]** *, without limitation:*

(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. 70. 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 **[**:**]** *, without limitation:*

(a) A description of the instruction;

(b) The date of instruction; and

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

Sec. 71. 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 **[**:**]** *, without limitation:*

(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 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. 72. 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. 73. 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.

Sec. 74. 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.

Sec. 75. 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; and

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.

Sec. 76. 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.

Sec. 77. 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.

Sec. 78. 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. 79. 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, 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. 80. 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.

X = Mean value of observations in sample.

X_i = ith observation in sample.

n = Number of observations in sample.

Sec. 81. NAC 459.713 is hereby amended to read as follows:

459.713 1. 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. 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. In addition to the requirements adopted pursuant to subsection 1 and the requirements set forth in subsection 2, 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. 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. 82. 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 more 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. 83. 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, 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. 84. 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 or 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 29 of this regulation, except for:

(1) The telephone numbers of the person shipping and carrying the waste; and

(2) The certifications of the consignee and the person shipping 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 freight container.

Sec. 85. 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 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] *For* any 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. 86. NAC 459.824 is hereby amended to read as follows:

459.824 Any [broker] *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 29 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. 87. NAC 459.8245 is hereby amended to read as follows:

459.8245 Any **[**broker**]** *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 29 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 *, without limitation, 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. 88. 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. 89. 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 29 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 *, without limitation,* 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 *, without limitation,* spontaneously combustible and water-reactive materials.

Sec. 90. 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.