



Protecting, maintaining and improving the health of all Minnesotans

November 16, 2011

Duncan White, Acting Deputy Director
Division Materials Safety and State Agreements
Office of Federal and State Materials and
Environmental Management Programs
U.S. Nuclear Regulatory Commission
T8-E24
Washington, D.C. 20555-0001

Dear Mr. White:

Enclosed is a copy of the final revisions to the Minnesota Radiological Health Rules Relating to Radiation Safety dated August 9, 2011. The final revision does not indicate the changes that were made to the rules. In order to easily identify the changes made by underlined and stricken text, I have included the revision dated August 20, 2010 and the Order of Adoption dated July 8, 2011. The Order of Adoption shows the final changes that were made to the August 20, 2010 revision. The Rules correspond to the following equivalent amendments to NRC's regulations.


Table with 3 columns: Rats ID, Title, State Section. Row 1: 2009-1, Medical Use of Byproduct Material - Authorized User Clarification, 4731.4411, 4731.4412, 4731.4414, 4731.4433, 4731.4436, 4731.4443, 4731.4444, 4731.4445, 4731.4446, 4731.4458, 4731.4459, 4731.4479

In addition to making the NRC initiated changes listed above, this rulemaking accomplished the following: expanded the exception to posting to include afterloaders and gamma stereotactic radiosurgery units; clarified the report requirements for leaking sources; deleted redundant language; removed the individual monitoring reporting requirement for industrial radiography licensees; clarified the notification and reporting requirements for industrial radiography events; added requirements for control of aerosols and gases; and added qualifications for nuclear medicine technologists.

We believe that adoption of these revisions satisfies the compatibility and health and safety categories established in the Office of Federal and State Materials and Environmental Management Programs (FSME) Procedure SA-200.

If you have any questions, please feel free to contact me at 651-201-4522 or by email at [sherrie.flaherty@state.mn.us](mailto:sherrie.flaherty@state.mn.us).

Sincerely,

A handwritten signature in black ink, appearing to read "Sherrie Flaherty, D.C.", written in a cursive style.

Sherrie Flaherty, MHP, DC, Supervisor  
Minnesota Department of Health  
Radioactive Materials Unit  
PO Box 64975  
St. Paul, MN 55164-0975

Enclosures: As stated

1.1 **4731.2320 EXCEPTIONS TO POSTING REQUIREMENTS.**

1.2 [For text of subps 1 to 3, see M.R.]

1.3 Subp. 4. **Hospital; teletherapy, remote afterloader, or gamma stereotactic**  
1.4 **radiosurgery units.** A room in a hospital or clinic that is used for teletherapy, remote  
1.5 afterloader, or gamma stereotactic radiosurgery units is exempt from the requirement  
1.6 to post a caution sign if:

1.7 [For text of items A and B, see M.R.]

1.8 **4731.2360 LEAK TEST REQUIREMENTS.**

1.9 [For text of subps 1 to 4, see M.R.]

1.10 Subp. 5. **Level of detection.** The leak test must be capable of detecting the presence  
1.11 of 0.005 microcurie (185 becquerel) of radioactive material on the test sample.

1.12 A. If the test reveals the presence of 0.005 microcurie (185 becquerel) or more  
1.13 of removable contamination, the source must be removed immediately from service and  
1.14 decontaminated, repaired, or disposed of according to this chapter.

1.15 B. The licensee must file a report with the commissioner within five days.  
1.16 The report must include:

- 1.17 (1) the model number and serial number, if assigned, of the leaking source;
- 1.18 (2) the identity of the radionuclide and its estimated activity;
- 1.19 (3) the results of the test;
- 1.20 (4) the date of the test; and
- 1.21 (5) the action taken.

1.22 [For text of subps 6 to 8, see M.R.]

1.23 **4731.2510 RECORDS; SURVEYS.**

2.1 Subpart 1. **Record maintenance; three years.** A licensee must maintain records  
2.2 showing the results of surveys and calibrations required under parts 4731.2200 and  
2.3 4731.2350, subpart 2, for three years after the record is made. The record must include:

2.4 A. the date of the measurements;

2.5 B. the manufacturer's name, model number, and serial number for the  
2.6 instrument used to measure radiation or contamination levels;

2.7 C. the radiation or contamination level; and

2.8 D. the name or initials of the individual who performed the surveys or  
2.9 calibrations.

2.10 [For text of subp 2, see M.R.]

2.11 Subp. 3. **Instrument identification.** To satisfy the requirements in subpart 1, item  
2.12 B, licensees may assign a unique identification to an instrument provided:

2.13 A. the manufacturer's name, model number, and serial number for each  
2.14 instrument is maintained and available for inspection by the department; and

2.15 B. the unique identification is indicated on each instrument.

2.16 **4731.2520 DETERMINATION OF PRIOR OCCUPATIONAL DOSE.**

2.17 [For text of subps 1 to 3, see M.R.]

2.18 Subp. 4. **Record keeping.** A licensee must record the exposure history of each  
2.19 individual, as required by subpart 1 or 2, on a cumulative occupational exposure record  
2.20 form prescribed by the commissioner, or other clear and legible record including all of the  
2.21 information required by the commissioner's form. The form or record must show each  
2.22 period in which the individual received occupational exposure to radiation or radioactive  
2.23 material and must be signed by the individual who received the exposure. For each period  
2.24 for which the licensee obtains reports, the licensee must use the dose shown in the report

3.1 in preparing the exposure record. For any period in which the licensee does not obtain a  
 3.2 report, the licensee must place a notation on the record indicating the periods and time  
 3.3 for which data are not available.

3.4 [For text of subps 5 and 6, see M.R.]

3.5 **4731.2650 REPORTS; INDIVIDUAL MONITORING.**

3.6 A. This part applies to a person licensed by the commissioner to possess or use  
 3.7 at any time for processing or manufacturing for distribution according to parts 4731.3000  
 3.8 to 4731.3175, 4731.3300 to 4731.3580, or 4731.4400 to 4731.4527, radioactive material  
 3.9 in quantities exceeding any one of the following quantities:

3.10	Radionuclide	Quantity of
3.11		Radionuclide in curies
3.12	Cesium-137	1
3.13	Cobalt-60	1
3.14	Gold-198	100
3.15	Iodine-131	1
3.16	Iridium-192	10
3.17	Krypton-85	1,000
3.18	Promethium-147	10
3.19	Technetium-99m	1,000

3.20 B. The commissioner may require reports from licensees who are licensed to  
 3.21 use radionuclides not listed under item A in quantities sufficient to cause comparable  
 3.22 radiation levels.

3.23 C. A licensee under item A must submit an annual report of the results of  
 3.24 individual monitoring carried out by the licensee for each individual for whom monitoring  
 3.25 was required under part 4731.2210 during that year. The licensee may include additional  
 3.26 data for individuals for whom monitoring was provided but not required. The licensee

4.1 must use an NRC Form 5, or its equivalent, or electronic media containing all the  
4.2 information required by the NRC form, to file the report.

4.3 D. A licensee must file the report required under item C, covering the preceding  
4.4 year, on or before April 30 of each year. A licensee must submit the report to the  
4.5 commissioner.

4.6 **4731.4070 LEAK TESTING, REPLACEMENT, AND OTHER MODIFICATIONS**  
4.7 **OF SEALED SOURCES.**

4.8 [For text of subps 1 and 2, see M.R.]

4.9 Subp. 3. **Leaking source.**

4.10 [For text of items A and B, see M.R.]

4.11 C. A report must be filed with the commissioner, within five days and must  
4.12 include:

- 4.13 (1) the model number and serial number, if assigned, of the leaking source;  
4.14 (2) the identity of the radionuclide and its estimated activity;  
4.15 (3) the results of the test;  
4.16 (4) the date of the test; and  
4.17 (5) the action taken.

4.18 [For text of subp 4, see M.R.]

4.19 **4731.4350 NOTIFICATIONS.**

4.20 Subpart 1. **Immediate notification required.** A licensee must notify the  
4.21 commissioner as soon as possible but not later than four hours after the discovery of any  
4.22 event that prevents immediate protective actions necessary to avoid exposures to radiation  
4.23 or radioactive materials that could exceed regulatory limits or releases of licensed material

5.1 that could exceed regulatory limits. Reportable events under this subpart include fires,  
5.2 explosions, toxic gas release, or similar hazards.

5.3 Subp. 2. **24-hour notification required.** A licensee must notify the commissioner  
5.4 within 24 hours after discovery of any of the following events involving licensed material:

5.5 A. the occurrence of any of the following incidents involving radiographic  
5.6 equipment:

5.7 (1) unintentional disconnection of the source assembly from the control  
5.8 cable;

5.9 (2) inability to retract the source assembly to its fully shielded position and  
5.10 secure it in the fully shielded position; or

5.11 (3) failure of any component, critical to safe operation of the device, to  
5.12 properly perform its intended function;

5.13 B. an event in which equipment is disabled or fails to function as designed when:

5.14 (1) the equipment is required by rule or license condition to prevent  
5.15 releases exceeding regulatory limits, to prevent exposure to radiation and radioactive  
5.16 materials exceeding regulatory limits, or to mitigate the consequences of an accident;

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

5.19 (3) no redundant equipment is available and operable to perform the  
5.20 required safety function;

5.21 C. an unplanned contamination event that:

5.22 (1) requires access to the contaminated area, by workers or the public, to  
5.23 be restricted for more than 24 hours by imposing additional radiological controls or by  
5.24 prohibiting entry into the areas;

6.1 (2) involves a quantity of material greater than five times the lowest annual  
6.2 limit on intake specified in part 4731.2750 for the material; and

6.3 (3) restricts access to the area for a reason other than to allow isotopes with  
6.4 a half-life of less than 24 hours to decay prior to decontamination;

6.5 D. an event that requires unplanned medical treatment at a medical facility of  
6.6 an individual with spreadable radioactive contamination on the individual's clothing or  
6.7 body; or

6.8 E. an unplanned fire or explosion that damages any licensed material or any  
6.9 device, container, or equipment containing licensed materials when:

6.10 (1) the quantity of material involved is five times the lowest annual limit  
6.11 on intake specified in part 4731.2750; and

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

6.13 **Subp. 3. Preparation and submission of notifications.** A licensee must make  
6.14 notifications required under subparts 1 and 2 by telephone to the commissioner. To the  
6.15 extent the information is available at the time of notification, the information provided  
6.16 must include:

6.17 A. the caller's name and call-back telephone number;

6.18 B. a description of the event, including date and time;

6.19 C. the exact location of the event;

6.20 D. the isotopes, quantities, and chemical and physical form of the licensed  
6.21 material involved; and

6.22 E. any personnel radiation exposure data available.

6.23 **Subp. 4. Reports required.** A licensee who makes a notification required under  
6.24 subpart 1 or 2 must submit a written follow-up report within 30 days of the notification.



7.1 Written reports prepared as required by other rules may be submitted to fulfill this  
7.2 requirement if the reports contain all of the necessary information and the appropriate  
7.3 distribution is made. The reports must be sent to the commissioner and include:

- 7.4 A. a description of the incident;
- 7.5 B. the cause of each incident, if known;
- 7.6 C. the name of the manufacturer and model number of equipment involved  
7.7 in the incident;
- 7.8 D. the place, date, and time of the incident;
- 7.9 E. the actions taken to establish normal operations;
- 7.10 F. the corrective actions taken or planned to prevent recurrence;
- 7.11 G. the qualifications of personnel involved in the incident;
- 7.12 H. the isotopes, quantities, and chemical and physical form of the licensed  
7.13 material involved;
- 7.14 I. the results of any evaluations or assessments; and
- 7.15 J. the extent of exposure of individuals to radiation or to radioactive materials,  
7.16 without identification of the individuals by name.

7.17 Subp. 5. **Reporting unlisted use.** A licensee conducting radiographic operations or  
7.18 storing radioactive material at any location not listed on the license for a period in excess of  
7.19 180 days in a calendar year must notify the commissioner prior to exceeding the 180 days.

7.20 **4731.4411 RADIATION SAFETY OFFICER TRAINING.**

7.21 [For text of subp 1, see M.R.]

7.22 Subp. 2. **Certification requirements.** A specialty board under subpart 1, item A,  
7.23 shall require all candidates for certification to:

8.1 [For text of item A, see M.R.]

8.2 B. (1) hold a master's or doctor's degree in physics, medical physics, other  
8.3 physical science, engineering, or applied mathematics from an accredited college or  
8.4 university;

8.5 (2) have two years of full-time practical training or supervised experience  
8.6 in medical physics:

8.7 (a) under the supervision of a medical physicist who is certified in  
8.8 medical physics by a specialty board recognized by the NRC or an agreement state; or

8.9 (b) in clinical nuclear medicine facilities providing diagnostic or  
8.10 therapeutic services under the direction of physicians who meet the requirements for  
8.11 authorized users in part 4731.4414, 4731.4436, or 4731.4443; and

8.12 (3) pass an examination, administered by diplomates of the specialty board,  
8.13 that assesses knowledge and competence in clinical diagnostic radiological or nuclear  
8.14 medicine physics and in radiation safety.

8.15 **4731.4412 AUTHORIZED MEDICAL PHYSICIST TRAINING.**

8.16 Subpart 1. **Training and education requirements.** Except as provided in part  
8.17 4731.4414, a licensee must require an authorized medical physicist to be an individual  
8.18 who:

8.19 A. is certified by a specialty board whose certification process has been  
8.20 recognized by the NRC or an agreement state and:

8.21 (1) has obtained written attestation that the individual has satisfactorily  
8.22 completed the requirements in this item and subpart 2 and has achieved a level of  
8.23 competency sufficient to function independently as an authorized medical physicist for  
8.24 each type of therapeutic medical unit for which the individual is requesting authorized  
8.25 medical physicist status. The written attestation must be signed by a preceptor authorized

9.1 medical physicist who meets the requirements in this part, part 4731.4414, or equivalent  
9.2 NRC or agreement state requirements for an authorized medical physicist for each type  
9.3 of therapeutic medical unit for which the individual is requesting authorized medical  
9.4 physicist status; and

9.5 [For text of subitem (2), see M.R.]

9.6 B. (1) holds a master's or doctor's degree in physics, medical physics, other  
9.7 physical science, engineering, or applied mathematics from an accredited college or  
9.8 university, and:

9.9 [For text of units (a) and (b), see M.R.]

9.10 (2) has obtained written attestation that the individual has satisfactorily  
9.11 completed the requirements in this item and has achieved a level of competency sufficient  
9.12 to function independently as an authorized medical physicist for each type of therapeutic  
9.13 medical unit for which the individual is requesting authorized medical physicist status.  
9.14 The written attestation must be signed by a preceptor authorized medical physicist who  
9.15 meets the requirements in this part, part 4731.4414, or equivalent NRC or agreement state  
9.16 requirements for an authorized medical physicist for each type of therapeutic medical unit  
9.17 for which the individual is requesting authorized medical physicist status; and

9.18 [For text of subitem (3), see M.R.]

9.19 Subp. 2. **Certification requirements.** A specialty board under subpart 1, item A,  
9.20 shall require all candidates for certification to:

9.21 [For text of item A, see M.R.]

9.22 B. have two years of full-time practical training or supervised experience in  
9.23 medical physics:

10.1 (1) under the supervision of a medical physicist who is certified in medical  
10.2 physics by a specialty board recognized by the commissioner, the NRC, or an agreement  
10.3 state; or

10.4 (2) in clinical radiation facilities providing high-energy, external beam  
10.5 therapy (photons and electrons with energies greater than or equal to 1,000,000 electron  
10.6 volts) and brachytherapy services under the direction of physicians who meet the  
10.7 requirements in part 4731.4414, 4731.4458, or 4731.4479; and

10.8 [For text of item C, see M.R.]

10.9 **4731.4414 TRAINING; EXPERIENCED RADIATION SAFETY OFFICER,**  
10.10 **TELE THERAPY OR MEDICAL PHYSICIST, AUTHORIZED USER, AND**  
10.11 **NUCLEAR PHARMACIST.**

10.12 [For text of items A to D, see M.R.]

10.13 E. Individuals who need not comply with training requirements described in  
10.14 this part may serve as preceptors for, and supervisors of, applicants seeking authorization  
10.15 on licenses issued under this chapter for the same uses for which these individuals are  
10.16 authorized.

10.17 **4731.4430 CONTROL OF AEROSOLS AND GASES.**

10.18 Subpart 1. **Collection system.** A licensee who administers radioactive aerosols or  
10.19 gases must do so with a system that will keep airborne concentrations within the limits  
10.20 prescribed by parts 4731.2020 and 4731.2090.

10.21 Subp. 2. **System vented or system collection.** The system must either be directly  
10.22 vented to the atmosphere through an air exhaust or provide for collection and decay or  
10.23 disposal of the aerosol or gas in a shielded container.

10.24 Subp. 3. **Negative pressure required.** A licensee must only administer radioactive  
10.25 gases in rooms that are at negative pressure compared to surrounding rooms.

11.1 Subp. 4. **Calculation of time needed after a release.** Before receiving, using, or  
11.2 storing a radioactive gas, the licensee must calculate the amount of time needed after a  
11.3 release to reduce the concentration in the area of use to the occupational limit listed in  
11.4 part 4731.2750. The calculation must be based on the highest activity of gas handled in a  
11.5 single container and the measured available air exhaust rate.

11.6 Subp. 5. **Posting time needed after a release.** A licensee must post the time needed  
11.7 after a release to reduce the concentration to the occupational limit calculated for the area  
11.8 of use and require that, in case of a gas spill, individuals evacuate the room until the  
11.9 posted time has elapsed.

11.10 Subp. 6. **Monthly check on collection system.** A licensee must check the operation  
11.11 of collection systems monthly and measure the ventilation rates in areas of use at intervals  
11.12 not to exceed six months.

11.13 Subp. 7. **Records retention.** Records of these checks and measurements must be  
11.14 maintained for three years.

11.15 **4731.4433 UPTAKE, DILUTION, AND EXCRETION STUDIES; TRAINING.**

11.16 Subpart 1. **Training and education requirements.** Except as provided under part  
11.17 4731.4414, a licensee must require the authorized user of unsealed radioactive material for  
11.18 the uses authorized under part 4731.4432 to be a physician who:

11.19 A. is certified by a medical specialty board whose certification process has been  
11.20 recognized by the NRC or an agreement state and has obtained written attestation, signed  
11.21 by a preceptor authorized user who meets the requirements of this part, part 4731.4414,  
11.22 4731.4436, or 4731.4443, or equivalent requirements of the NRC or an agreement state,  
11.23 that the individual has satisfactorily completed the requirements in subpart 2 and has  
11.24 achieved a level of competency sufficient to function independently as an authorized user  
11.25 for the medical uses authorized under part 4731.4432;

12.1 B. is an authorized user under part 4731.4436 or 4731.4443 or under equivalent  
12.2 requirements of the NRC or an agreement state; or

12.3 C. has:

12.4 (1) completed 60 hours of training and experience, including a minimum of  
12.5 eight hours of classroom and laboratory training, in basic radionuclide handling techniques  
12.6 applicable to the medical use of unsealed radioactive material for uptake, dilution, and  
12.7 excretion studies. The training and experience must include:

12.8 [For text of unit (a), see M.R.]

12.9 (b) work experience, under the supervision of an authorized user  
12.10 who meets the requirements in this part, part 4731.4414, 4731.4436, or 4731.4443, or  
12.11 equivalent requirements of the NRC or an agreement state, involving:

12.12 [For text of subunits i to vi, see M.R.]

12.13 (2) obtained written attestation, signed by a preceptor authorized user  
12.14 who meets the requirements of this part, part 4731.4414, 4731.4436, or 4731.4443,  
12.15 or equivalent requirements of the NRC or an agreement state, that the individual has  
12.16 satisfactorily completed the requirements in this item and has achieved a level of  
12.17 competency sufficient to function independently as an authorized user for the medical uses  
12.18 authorized under part 4731.4432.

12.19 [For text of subp 2, see M.R.]

12.20 **4731.4436 IMAGING AND LOCALIZATION STUDIES; TRAINING.**

12.21 Subpart 1. **Training and education requirements.** Except as provided under part  
12.22 4731.4414, a licensee must require an authorized user of unsealed radioactive material for  
12.23 the uses authorized under part 4731.4434 to be a physician who is qualified as follows  
12.24 under item A, B, or C:

12.25 A. The physician must:

13.1 (1) be certified by a medical specialty board whose certification process  
13.2 has been recognized by the NRC or an agreement state;

13.3 (2) must also have obtained written attestation that the individual physician  
13.4 has satisfactorily completed the requirements in subpart 2 and has achieved a level of  
13.5 competency sufficient to function independently as an authorized user for the medical  
13.6 uses authorized under parts 4731.4432 and 4731.4434. The attestation must be signed  
13.7 by a preceptor authorized user who meets:

13.8 (a) the requirements in this part;

13.9 (b) the requirements in item C, subitem (1), unit (b), subunit vii, and  
13.10 part 4731.4443;

13.11 (c) the requirements in part 4731.4414; or

13.12 (d) equivalent requirements of the NRC or an agreement state.

13.13 B. The physician must be an authorized user under part 4731.4443 and meet the  
13.14 requirements in item C, subitem (1), unit (b), subunit vii, or equivalent requirements of the  
13.15 NRC or an agreement state; or

13.16 C. The physician must have:

13.17 (1) completed 700 hours of training and experience, including a minimum  
13.18 of 80 hours of classroom and laboratory training; in basic radionuclide handling techniques  
13.19 applicable to the medical use of unsealed radioactive material for imaging and localization  
13.20 studies. The training and experience must include, at a minimum:

13.21 [For text of unit (a), see M.R.]

13.22 (b) work experience, under the supervision of an authorized user who  
13.23 meets the requirements in this part, part 4731.4414, or in subunit vii and part 4731.4443,  
13.24 or equivalent requirements of the NRC or an agreement state, involving:

14.1 [For text of subunits i to vii, see M.R.]

14.2 (2) obtained written attestation that the individual physician has  
14.3 satisfactorily completed the requirements in this item and has achieved a level of  
14.4 competency sufficient to function independently as an authorized user for the medical  
14.5 uses authorized under parts 4731.4432 and 4731.4434. The attestation must be signed  
14.6 by a preceptor authorized user who meets:

14.7 (a) the requirements in this part;

14.8 (b) the requirements in subitem (1), unit (b), subunit vii, and part  
14.9 4731.4443;

14.10 (c) the requirements in part 4731.4414; or

14.11 (d) equivalent requirements of the NRC or an agreement state.

14.12 Subp. 2. **Certification requirements.** A specialty board shall require all candidates  
14.13 for certification to:

14.14 A. complete 700 hours of training and experience in basic radionuclide handling  
14.15 techniques and radiation safety applicable to the medical use of unsealed radioactive  
14.16 material for imaging and localization studies that include the topics listed in subpart 1,  
14.17 item C, subitem (1), units (a) and (b); and

14.18 B. pass an examination administered by diplomates of the specialty board,  
14.19 which assesses knowledge and competence in radiation safety, radionuclide handling,  
14.20 and quality control.

14.21 **4731.4443 UNSEALED RADIOACTIVE MATERIAL; WRITTEN DIRECTIVE**  
14.22 **REQUIRED; TRAINING.**

14.23 Subpart 1. **Training and education requirements.** Except as provided under part  
14.24 4731.4414, a licensee must require an authorized user of unsealed radioactive material for  
14.25 the uses authorized under part 4731.4440 to be a physician who:



15.1           A. is certified by a medical specialty board whose certification process has  
15.2 been recognized by the NRC or an agreement state, meets the requirements in item B,  
15.3 subitem (1), unit (b), subunit vi, and has obtained written attestation that the individual  
15.4 has satisfactorily completed the requirements in this item and subpart 2 and has achieved  
15.5 a level of competency sufficient to function independently as an authorized user for the  
15.6 medical uses authorized under part 4731.4440. The written attestation must be signed by  
15.7 a preceptor authorized user who meets the requirements of this part, part 4731.4414, or  
15.8 equivalent requirements of the NRC or an agreement state. A preceptor authorized user  
15.9 who meets the requirements in item B must also have experience in administering dosages  
15.10 in the same dosage category or categories under item B, subitem (1), unit (b), subunit vi,  
15.11 as the individual requesting authorized user status; or

15.12           B. has:

15.13                 (1) completed 700 hours of training and experience, including a minimum  
15.14 of 200 hours of classroom and laboratory training, in basic radionuclide handling  
15.15 techniques applicable to the medical use of unsealed radioactive material requiring a  
15.16 written directive. The training and experience must include:

15.17                                 [For text of unit (a), see M.R.]

15.18                 (b) work experience, under the supervision of an authorized user who  
15.19 meets the requirements in this part, part 4731.4414, or equivalent requirements of the  
15.20 NRC or an agreement state. A supervising authorized user who meets the requirements in  
15.21 this item must also have experience in administering dosages in the same dosage category  
15.22 or categories under subunit vi as the individual requesting authorized user status. The  
15.23 work experience must involve:

15.24                                 [For text of subunits i to vi, see M.R.]

15.25                 (2) obtained written attestation that the individual has satisfactorily  
15.26 completed the requirements in this item and has achieved a level of competency sufficient

16.1 to function independently as an authorized user for the medical uses authorized under part  
16.2 4731.4440. The written attestation must be signed by a preceptor authorized user who  
16.3 meets the requirements of this part, part 4731.4414, or equivalent requirements of the  
16.4 NRC or an agreement state. A preceptor authorized user who meets the requirements  
16.5 in this item must also have experience in administering dosages in the same dosage  
16.6 category or categories under subitem (1), unit (b), subunit vi, as the individual requesting  
16.7 authorized user status.

16.8 [For text of subp 2, see M.R.]

16.9 **4731.4444 ORAL ADMINISTRATION OF SODIUM IODIDE I-131; QUANTITIES**  
16.10 **LESS THAN OR EQUAL TO 33 MILLICURIES (1.22 GBq); WRITTEN**  
16.11 **DIRECTIVE REQUIRED; TRAINING.**

16.12 Except as provided under part 4731.4414, a licensee must require an authorized  
16.13 user for the oral administration of sodium iodide (I-131) requiring a written directive in  
16.14 quantities less than or equal to 33 millicuries (1.22 GBq) to be a physician who:

16.15 A. is certified by a medical specialty board whose certification process has been  
16.16 recognized by the NRC or an agreement state and includes all of the requirements of  
16.17 item C, subitems (1) and (2), and who has obtained written attestation that the individual  
16.18 has satisfactorily completed the requirements of item C, subitems (1) and (2), and has  
16.19 achieved a level of competency sufficient to function independently as an authorized user  
16.20 for medical uses authorized under part 4731.4440. The written attestation must be signed  
16.21 by a preceptor authorized user who meets the requirements of this part, part 4731.4414,  
16.22 4731.4443, or 4731.4445, or equivalent requirements of the NRC or an agreement state. A  
16.23 preceptor authorized user who meets the requirement in part 4731.4443, subpart 1, item B,  
16.24 must also have experience in oral administration of less than or equal to 33 millicuries  
16.25 (1.22 GBq) of sodium iodide (I-131) for which a written directive is required or oral  
16.26 administration of greater than 33 millicuries (1.22 GBq) of sodium iodide (I-131) as  
16.27 specified in part 4731.4443, subpart 1, item B, subitem (1), unit (b), subunit vi;

17.1 [For text of item B, see M.R.]

17.2 C. has:

17.3 [For text of subitem (1), see M.R.]

17.4 (2) work experience under the supervision of an authorized user who meets  
17.5 the requirements of this part, part 4731.4414, 4731.4443, or 4731.4445, or equivalent  
17.6 requirements of the NRC or an agreement state. A supervising authorized user who meets  
17.7 the requirements in part 4731.4443, subpart 1, item B, must also have experience in  
17.8 oral administration of less than or equal to 33 millicuries (1.22 GBq) of sodium iodide  
17.9 (I-131) for which a written directive is required or oral administration of greater than 33  
17.10 millicuries (1.22 GBq) of sodium iodide (I-131) as specified in part 4731.4443. The  
17.11 work experience must involve:

17.12 [For text of units (a) to (f), see M.R.]

17.13 (3) obtained written attestation that the individual has satisfactorily  
17.14 completed the requirements of this item and has achieved a level of competency sufficient  
17.15 to function independently as an authorized user for medical uses authorized under  
17.16 part 4731.4440. The written attestation must be signed by a preceptor authorized user  
17.17 who meets the requirements of this part, part 4731.4414, 4731.4443, or 4731.4445, or  
17.18 equivalent requirements of the NRC or an agreement state. A preceptor authorized user  
17.19 who meets the requirement in part 4731.4443, subpart 1, item B, must also have experience  
17.20 in oral administration of less than or equal to 33 millicuries (1.22 GBq) of sodium iodide  
17.21 (I-131) for which a written directive is required or oral administration of greater than 33  
17.22 millicuries (1.22 GBq) of sodium iodide (I-131) as specified in part 4731.4443.

17.23 **4731.4445 ORAL ADMINISTRATION OF SODIUM IODIDE; QUANTITIES**  
17.24 **GREATER THAN 33 MILLICURIES (1.22 GBq); WRITTEN DIRECTIVE**  
17.25 **REQUIRED; TRAINING.**

18.1 Except as provided under part 4731.4414, a licensee must require an authorized  
18.2 user for the oral administration of sodium iodide (I-131) requiring a written directive in  
18.3 quantities greater than 33 millicuries (1.22 GBq) to be a physician who:

18.4 A. is certified by a medical specialty board whose certification process has  
18.5 been recognized by the NRC or an agreement state and includes all the requirements in  
18.6 item C, subitems (1) and (2), and who has obtained written attestation that the individual  
18.7 has satisfactorily completed the requirements of this item and has achieved a level of  
18.8 competency sufficient to function independently as an authorized user for medical uses  
18.9 authorized under part 4731.4440. The written attestation must be signed by a preceptor  
18.10 authorized user who meets the requirements in this part, part 4731.4414 or 4731.4443,  
18.11 or equivalent requirements of the NRC or an agreement state. A preceptor authorized  
18.12 user who meets the requirements in part 4731.4443, subpart 1, item B, must also have  
18.13 experience in the oral administration of I-131 in quantities greater than 33 millicuries as  
18.14 specified in part 4731.4443, subpart 1, item B, subitem (1), unit (b), subunit vi;

18.15 [For text of item B, see M.R.]

18.16 C. has:

18.17 [For text of subitem (1), see M.R.]

18.18 (2) has work experience, under the supervision of an authorized user who  
18.19 meets the requirements of this part, part 4731.4414 or 4731.4443, subpart 1, item A or B,  
18.20 or equivalent requirements of the NRC or an agreement state. A supervising authorized  
18.21 user who meets the requirements in part 4731.4443, subpart 1, item B, must also have  
18.22 experience in the oral administration of I-131 in quantities greater than 33 millicuries  
18.23 under part 4731.4443, subpart 1, item B, subitem (1), unit (b), subunit vi. The work  
18.24 experience must involve:

18.25 [For text of units (a) to (f), see M.R.]

19.1 (3) obtained written attestation that the individual has satisfactorily  
19.2 completed the requirements of this item and has achieved a level of competency sufficient  
19.3 to function independently as an authorized user for medical uses authorized under  
19.4 part 4731.4440. The written attestation must be signed by a preceptor authorized user  
19.5 who meets the requirements in this part, part 4731.4414 or 4731.4443, or equivalent  
19.6 requirements of the NRC or an agreement state. A preceptor authorized user who meets  
19.7 the requirements in part 4731.4443, subpart 1, item B, must also have experience in the  
19.8 oral administration of I-131 in quantities greater than 33 millicuries under part 4731.4443,  
19.9 subpart 1, item B, subitem (1), unit (b), subunit vi.

19.10 **4731.4446 PARENTERAL ADMINISTRATION OF UNSEALED RADIOACTIVE**  
19.11 **MATERIAL; WRITTEN DIRECTIVE REQUIRED; TRAINING.**

19.12 [For text of item A, see M.R.]

19.13 B. The physician under item A, subitems (2) and (3), must have:

19.14 [For text of subitem (1), see M.R.]

19.15 (2) work experience, under the supervision of an authorized user who meets  
19.16 the requirements in this part, part 4731.4414 or 4731.4443, or equivalent requirements of  
19.17 the NRC or agreement state, in the parenteral administration, for which a written directive  
19.18 is required, of any beta emitter, or any photon-emitting radionuclide with a photon energy  
19.19 less than 150 keV or parenteral administration of any other radionuclide for which a  
19.20 written directive is required. A supervising authorized user who meets the requirements in  
19.21 part 4731.4443 must have experience in parenteral administration of any beta emitter, or a  
19.22 photon-emitting radionuclide with a photon energy less than 150 kilo electron volts for  
19.23 which a written directive is required or parenteral administration of any other radionuclide  
19.24 for which a written directive is required as specified in part 4731.4443, subpart 1, item B,  
19.25 subitem (1), unit (b), subunit vi. The work experience must involve:

19.26 [For text of units (a) to (f), see M.R.]

20.1 (3) obtained written attestation that the individual has satisfactorily  
20.2 completed the requirements in this item and item A, subitem (2) or (3), and has achieved  
20.3 a level of competency sufficient to function independently as an authorized user for the  
20.4 parenteral administration of unsealed radioactive material requiring a written directive.  
20.5 The written attestation must be signed by a preceptor authorized user who meets the  
20.6 requirements in this part, part 4731.4414, or 4731.4443, or equivalent requirements of  
20.7 the NRC or agreement state. A preceptor authorized user who meets the requirements in  
20.8 part 4731.4443 must have experience in parenteral administration of any beta emitter, or a  
20.9 photon-emitting radionuclide with a photon energy less than 150 kilo electron volts for  
20.10 which a written directive is required or parenteral administration of any other radionuclide  
20.11 for which a written directive is required as specified in part 4731.4443, subpart 1, item B,  
20.12 subitem (1), unit (b), subunit vi.

20.13 **4731.4458 MANUAL BRACHYTHERAPY TRAINING.**

20.14 Subpart 1. **Training and education requirements.** Except as provided under part  
20.15 4731.4414, a licensee must require an authorized user of a manual brachytherapy source  
20.16 for the uses authorized under part 4731.4450 to be a physician who:

20.17 A. is certified by a medical specialty board whose certification has been  
20.18 recognized by the NRC or an agreement state and has obtained written attestation,  
20.19 signed by a preceptor authorized user who meets the requirements of this part, part  
20.20 4731.4414, or equivalent requirements of the NRC or an agreement state, that the  
20.21 individual has satisfactorily completed the requirements of subpart 2 and has achieved a  
20.22 level of competency sufficient to function independently as an authorized user of manual  
20.23 brachytherapy sources for the medical uses authorized under part 4731.4450; or

20.24 B. has:

20.25 (1) completed a structured educational program in basic radionuclide  
20.26 handling techniques applicable to the use of manual brachytherapy sources that includes:

21.1 [For text of unit (a), see M.R.]

21.2 (b) 500 hours of work experience, under the supervision of an  
21.3 authorized user who meets the requirements in this part, part 4731.4414, or equivalent  
21.4 requirements of the NRC or an agreement state at a medical institution, involving:

21.5 [For text of subunits i to vi, see M.R.]

21.6 (2) completed three years of supervised clinical experience in radiation  
21.7 oncology, under an authorized user who meets the requirements of this part, part  
21.8 4731.4414, or equivalent requirements of the NRC or an agreement state, as part of a  
21.9 formal training program approved by the Residency Review Committee for Radiation  
21.10 Oncology of the Accreditation Council for Graduate Medical Education, the Royal  
21.11 College of Physicians and Surgeons of Canada, or the Committee on Postdoctoral Training  
21.12 of the American Osteopathic Association. This experience may be obtained concurrently  
21.13 with the supervised work experience required under subitem (1), unit (b); and

21.14 (3) obtained written attestation, signed by a preceptor authorized user  
21.15 who meets the requirements of this part, part 4731.4414, or equivalent requirements  
21.16 of the NRC or an agreement state, that the individual has satisfactorily completed the  
21.17 requirements of this item and has achieved a level of competency sufficient to function  
21.18 independently as an authorized user of manual brachytherapy sources for the medical uses  
21.19 authorized under part 4731.4450.

21.20 [For text of subp 2, see M.R.]

21.21 **4731.4459. OPHTHALMIC USE OF STRONTIUM-90; TRAINING.**

21.22 Except as provided under part 4731.4414, a licensee must require an authorized user  
21.23 of strontium-90 for ophthalmic radiotherapy to be a physician who:

21.24 A. is an authorized user under part 4731.4458 or equivalent requirements of the  
21.25 NRC or an agreement state; or

22.1 B. has:

22.2 [For text of subitems (1) and (2), see M.R.]

22.3 (3) obtained written attestation, signed by a preceptor authorized user  
22.4 who meets the requirements of this part, part 4731.4414, or 4731.4458, or equivalent  
22.5 requirements of the NRC or an agreement state, that the individual has satisfactorily  
22.6 completed the requirements in this item and has achieved a level of competency sufficient  
22.7 to function independently as an authorized user of strontium-90 for ophthalmic use.

22.8 **4731.4479 REMOTE AFTERLOADER UNITS, TELETHERAPY UNITS, AND**  
22.9 **GAMMA STEREOTACTIC RADIOSURGERY UNITS; TRAINING.**

22.10 Subpart 1. **Training and education requirements.** Except as provided under  
22.11 part 4731.4414, a licensee must require an authorized user of a sealed source for a use  
22.12 authorized under part 4731.4463 to be a physician who:

22.13 A. is certified by a medical specialty board whose certification process has been  
22.14 recognized by the NRC or an agreement state, meets the requirements in item B, subitem  
22.15 (4), and has obtained written attestation that the individual has satisfactorily completed  
22.16 the requirements in this item and subpart 2 and has achieved a level of competency  
22.17 sufficient to function independently as an authorized user of each type of therapeutic  
22.18 medical unit for which the individual is requesting authorized user status. The written  
22.19 attestation must be signed by a preceptor authorized user who meets the requirements of  
22.20 this part, part 4731.4414, or equivalent requirements of the NRC or an agreement state for  
22.21 an authorized user for each type of therapeutic medical unit for which the individual is  
22.22 requesting authorized user status; or

22.23 B. has:

22.24 (1) completed a structured educational program in basic radionuclide  
22.25 techniques applicable to the use of a sealed source in a therapeutic medical unit that  
22.26 includes:



23.1 [For text of unit (a), see M.R.]

23.2 (b) 500 hours of work experience, under the supervision of an  
23.3 authorized user who meets the requirements of this part, part 4731.4414, or equivalent  
23.4 requirements of the NRC or an agreement state, at a medical institution involving:

23.5 [For text of subunits i to vi, see M.R.]

23.6 (2) completed three years of supervised clinical experience in radiation  
23.7 therapy, under an authorized user who meets the requirements of this part, part 4731.4414,  
23.8 or equivalent requirements of the NRC or an agreement state, as part of a formal training  
23.9 program approved by the Residency Review Committee for Radiation Oncology of  
23.10 the Accreditation Council for Graduate Medical Education, the Royal College of  
23.11 Physicians and Surgeons of Canada, or the Committee on Postdoctoral Training of the  
23.12 American Osteopathic Association. The experience may be obtained concurrently with  
23.13 the supervised work experience required under subitem (1), unit (b);

23.14 (3) obtained written attestation that the individual has satisfactorily  
23.15 completed the requirements in this item and has achieved a level of competency sufficient  
23.16 to function independently as an authorized user of each type of therapeutic medical unit  
23.17 for which the individual is requesting authorized user status. The written attestation must  
23.18 be signed by a preceptor authorized user who meets the requirements of this part, part  
23.19 4731.4414, or equivalent requirements of the NRC or an agreement state for an authorized  
23.20 user for each type of therapeutic medical unit for which the individual is requesting  
23.21 authorized user status; and

23.22 [For text of subitem (4), see M.R.]

23.23 [For text of subp 2, see M.R.]

23.24 **4731.4525 MEDICAL EVENT; REPORT AND NOTIFICATION.**

23.25 [For text of subps 1 and 2, see M.R.]

24.1 Subp. 3. **24-hour notification required.** A licensee must notify the commissioner  
24.2 within 24 hours after discovery of a medical event.

24.3 [For text of subps 4 to 7, see M.R.]

24.4 **4731.4526 DOSE TO AN EMBRYO/FETUS OR CHILD; REPORT AND**  
24.5 **NOTIFICATION.**

24.6 [For text of subps 1, and 2, see M.R.]

24.7 Subp. 3. **24-hour notification required.** A licensee must notify the commissioner  
24.8 within 24 hours after discovery of a dose to an embryo/fetus or nursing child that requires  
24.9 a report under subpart 1 or 2.

24.10 [For text of subps 4 to 6, see M.R.]

24.11 **4731.4600 DEFINITIONS.**

24.12 Subpart 1. **Scope.** The following definitions apply to parts 4731.4605 to 4731.4620.

24.13 Subp. 2. **Accredited.** "Accredited" means an individual who has satisfactorily  
24.14 completed a nationally recognized examination in nuclear medicine and who maintains  
24.15 the registration or certification of the examining organization. Nationally recognized  
24.16 examinations are provided by the following organizations:

24.17 A. the American Registry of Radiologic Technologists (N) (ARRT);

24.18 B. the Nuclear Medicine Technology Certification Board (NMTCB); or

24.19 C. the American Society of Clinical Pathologists (NM) (ASCP).

24.20 Subp. 3. **Nuclear medicine technologist.** "Nuclear medicine technologist"  
24.21 means a person other than a licensed practitioner of the healing arts who administers  
24.22 radiopharmaceuticals and related drugs to human beings for diagnostic purposes,  
24.23 performs in vivo and in vitro detection and measurement of radioactivity, and administers  
24.24 radiopharmaceuticals to human beings for therapeutic purposes. A nuclear medicine

25.1 technologist may perform such procedures only while under the general supervision of  
25.2 a licensed practitioner of the healing arts who is licensed to possess and use radioactive  
25.3 materials.

25.4 Subp. 4. **Direct supervision.** "Direct supervision" means an accredited nuclear  
25.5 medicine technologist or an authorized user currently listed on an agreement state or  
25.6 United States Nuclear Regulatory Commission radioactive materials license is physically  
25.7 present in the facility and available to respond.

25.8 **4731.4605 MINIMUM STANDARDS FOR NUCLEAR MEDICINE**  
25.9 **TECHNOLOGISTS.**

25.10 Subpart 1. **General requirements.** Except as specified in part 4731.4610, any  
25.11 individual working as a nuclear medicine technologist in Minnesota must meet the  
25.12 following minimum eligibility requirements:

- 25.13 A. graduation from high school or its equivalent;
- 25.14 B. attainment of 18 years of age; and
- 25.15 C. ability to adequately perform necessary duties without posing a hazard to the  
25.16 health or safety of patients, other employees, or members of the public.

25.17 Subp. 2. **Accreditation required.** Except as specified in part 4731.4610, any  
25.18 individual working as a nuclear medicine technologist in Minnesota on or after January 1,  
25.19 2011, must be accredited.

25.20 Subp. 3. **Record retention.** The licensee must retain documentation of accreditation  
25.21 for five years and make it available for inspection upon request by the department.

25.22 **4731.4610 EXCEPTIONS.**

25.23 The individuals in items A to D are exempt from the examination requirement in  
25.24 part 4731.4600, subpart 2:

26.1           A. a licensed practitioner of the healing arts who is listed as an authorized  
26.2 user on an agreement state or United States Nuclear Regulatory Commission radioactive  
26.3 materials license;

26.4           B. individuals working as nuclear medicine technologists under the direct  
26.5 supervision of: (1) an individual who is accredited in nuclear medicine; or (2) a physician  
26.6 who appears as an authorized user on an agreement state or United States Nuclear  
26.7 Regulatory Commission radioactive materials license;

26.8           C. students enrolled in and participating in an accredited program for nuclear  
26.9 medicine technology or a school of medicine, osteopathy, podiatry, or chiropractic who, as  
26.10 a part of the students' course of study, administers radioactive material during supervised  
26.11 clinical experience; or

26.12           D. an individual working as a nuclear medicine technologist before January  
26.13 1, 2011, who is not accredited, provided the individual has completed the training in  
26.14 part 4731.4612.

26.15 **4731.4612 TRAINING FOR INDIVIDUALS FUNCTIONING AS A NUCLEAR**  
26.16 **MEDICINE TECHNOLOGIST BEFORE JANUARY 1, 2011, WHO ARE NOT**  
26.17 **ACCREDITED.**

26.18           Subpart 1. **Training program.** Individuals working as a nuclear medicine  
26.19 technologist before January 1, 2011, who are not accredited must complete a training  
26.20 program designed to demonstrate competency in the following areas:

- 26.21           A. patient and personnel protection including:
- 26.22               (1) biological effects of radiation;
- 26.23               (2) basic concepts of radiation protection; and
- 26.24               (3) Minnesota Department of Health rules for radiation exposure;
- 26.25           B. radiopharmaceutical characteristics including:

- 27.1 (1) half-life;
- 27.2 (2) method of localization; and
- 27.3 (3) biodistribution;
- 27.4 C. proper handling of radioactive materials including:
- 27.5 (1) inspection and survey of packages;
- 27.6 (2) storage of radioactive material;
- 27.7 (3) disposal of radioactive waste; and
- 27.8 (4) United States Department of Transportation training requirements for
- 27.9 shippers;
- 27.10 D. factors affecting image quality including:
- 27.11 (1) equipment;
- 27.12 (2) patient and detector orientation;
- 27.13 (3) patient anatomical factors;
- 27.14 (4) anatomical landmarks;
- 27.15 (5) immobilization techniques; and
- 27.16 (6) radiopharmaceuticals;
- 27.17 E. facility monitoring including:
- 27.18 (1) survey equipment operation and uses; and
- 27.19 (2) radioactive spill responses; and
- 27.20 F. administration of radiopharmaceuticals during supervised clinical experience.
- 27.21 Subp. 2. **Clinical experience.** Clinical experience must be supervised by an
- 27.22 individual who is accredited in nuclear medicine or by a physician who appears as an

28.1 authorized user on an agreement state or United States Nuclear Regulatory Commission  
28.2 radioactive materials license.

28.3 Subp. 3. **Restrictions during training.** Individuals in a training program  
28.4 indicated in subpart 1 cannot work as a nuclear medicine technologist before obtaining  
28.5 documentation of competency as required in part 4731.4615 unless the individual works  
28.6 under the direct supervision of:

28.7 A. an individual who is accredited in nuclear medicine; or

28.8 B. a physician who appears as an authorized user on an agreement state or  
28.9 United States Nuclear Regulatory Commission radioactive materials license.

28.10 Subp. 4. **Continuing education.** Individuals working as nuclear medicine  
28.11 technologists before January 1, 2011, who are not accredited must:

28.12 A. obtain 24 hours of continuing education on nuclear medicine every 24  
28.13 months;

28.14 B. have the continuing education training approved by any of the organizations  
28.15 listed in part 4731.4600, subpart 2; and

28.16 C. retain documentation of continuing education for five years and make it  
28.17 available for inspection upon request by the department.

28.18 **4731.4615 DOCUMENTATION OF COMPETENCY.**

28.19 Subpart 1. **Nuclear medicine technologist; January 1, 2011.** An individual  
28.20 functioning as a nuclear medicine technologist prior to January 1, 2011, and who is not  
28.21 accredited must obtain documentation that the individual is competent to apply ionizing  
28.22 radiation to human beings.

28.23 Subp. 2. **Who can document competency.** The documentation of competency must  
28.24 be provided by a licensed practitioner of the healing arts under whose general supervision  
28.25 the individual is employed or has been employed.

29.1 Subp. 3. **Procedures and equipment.** The documentation of competency must  
29.2 specify the nature of procedures and the equipment the individual is competent to utilize  
29.3 and must be limited to work performed before January 1, 2011.

29.4 Subp. 4. **Record retention.** The documentation of competency must be retained by  
29.5 the individual for inspection upon request by the department.

29.6 **4731.4620 REQUIREMENTS FOR OPERATORS OF FUSION IMAGING**  
29.7 **DEVICES.**

29.8 Subpart 1. **Accreditation required.** When a unit is operated as a fusion imaging  
29.9 device or in a dual mode such as a SPECT/CT or PET/CT device, the operator must be  
29.10 accredited or must meet the requirements in chapter 4732.

29.11 Subp. 2. **Diagnostic CT imaging device.** When the unit is operated as a stand-alone  
29.12 diagnostic CT imaging device, the operator must meet the requirements in chapter 4732.

1.1 Department of Health

1.2 Proposed Permanent Rules Relating to Radiation Safety

1.3 4731.2320 EXCEPTIONS TO POSTING REQUIREMENTS.

1.4 [For text of subps 1 to 3, see M.R.]

1.5 Subp. 4. Hospital; teletherapy, remote afterloader, or gamma stereotactic  
1.6 radiosurgery units. A room in a hospital or clinic that is used for teletherapy, remote  
1.7 afterloader, or gamma stereotactic radiosurgery units is exempt from the requirement  
1.8 to post a caution sign if:

1.9 [For text of items A and B, see M.R.]

1.10 4731.2360 LEAK TEST REQUIREMENTS.

1.11 [For text of subps 1 to 4, see M.R.]

1.12 Subp. 5. Level of detection. The leak test must be capable of detecting the presence  
1.13 of 0.005 microcurie (185 becquerel) of radioactive material on the test sample.

1.14 A. If the test reveals the presence of 0.005 microcurie (185 becquerel) or  
1.15 more of removable contamination, ~~a report must be filed with the Department of~~  
1.16 ~~Health according to part 4731.3110 and~~ the source must be removed immediately from  
1.17 service and decontaminated, repaired, or disposed of according to ~~Department of Health~~  
1.18 ~~regulations~~ this chapter.

1.19 B. The licensee must file a report with the commissioner within five days.  
1.20 The report must include:

1.21 (1) the model number and serial number, if assigned, of the leaking source;

1.22 (2) the identity of the radionuclide and its estimated activity;

1.23 (3) the results of the test;

1.24 (4) the date of the test; and





2.1 (5) the action taken.

2.2 [For text of subps 6 to 8, see M.R.]

2.3 **4731.2510 RECORDS; SURVEYS.**

2.4 Subpart 1. **Record maintenance; three years.** A licensee must maintain records  
2.5 showing the results of surveys and calibrations required under parts 4731.2200 and  
2.6 4731.2350, subpart 2, for three years after the record is made. The record must include:

2.7 A. the date of the measurements;

2.8 B. the manufacturer's name, model number, and serial number for the  
2.9 instrument used to measure radiation or contamination levels;

2.10 C. the radiation or contamination level; and

2.11 D. the name or initials of the individual who performed the surveys or  
2.12 calibrations.

2.13 [For text of subp 2, see M.R.]

2.14 **Subp. 3. Instrument identification.** To satisfy the requirements in subpart 1, item  
2.15 B, licensees may assign a unique identification to an instrument provided:

2.16 A. the manufacturer's name, model number, and serial number for each  
2.17 instrument is maintained and available for inspection by the department; and

2.18 B. the unique identification is indicated on each instrument.

2.19 **4731.2520 DETERMINATION OF PRIOR OCCUPATIONAL DOSE.**

2.20 [For text of subps 1 to 3, see M.R.]

2.21 **Subp. 4. Record keeping.**

2.22 ~~A.~~ A licensee must record the exposure history of each individual, as required  
2.23 by subpart 1 or 2, on a cumulative occupational exposure record form prescribed by the

3.1 commissioner, or other clear and legible record including all of the information required  
3.2 by the commissioner's form. The form or record must show each period in which the  
3.3 individual received occupational exposure to radiation or radioactive material and must  
3.4 be signed by the individual who received the exposure. For each period for which the  
3.5 licensee obtains reports, the licensee must use the dose shown in the report in preparing  
3.6 the exposure record. For any period in which the licensee does not obtain a report, the  
3.7 licensee must place a notation on the record indicating the periods and time for which  
3.8 data are not available.

3.9 ~~B. A licensee is not required to partition historical dose between external dose~~  
3.10 ~~equivalents and internal committed dose equivalents. Occupational exposure histories~~  
3.11 ~~obtained and recorded on the cumulative occupational exposure record form, or its~~  
3.12 ~~equivalent, before January 1, 1994, might not have included effective dose equivalents,~~  
3.13 ~~but may be used in the absence of specific information on the intake of radionuclides by~~  
3.14 ~~the individual.~~

3.15 ~~C. The form or record must:~~

3.16 ~~(1) show each period in which the individual received occupational~~  
3.17 ~~exposure to radiation or radioactive material; and~~

3.18 ~~(2) be signed by the individual who received the exposure.~~

3.19 ~~D. For each period for which a licensee obtains reports, the licensee must use~~  
3.20 ~~the dose shown in the report in preparing the form or its equivalent.~~

3.21 ~~E. For any period in which a licensee does not obtain a report, the licensee must~~  
3.22 ~~place a notation on the form or its equivalent, indicating the periods of time for which~~  
3.23 ~~data are not available.~~

3.24 [For text of subps 5 and 6, see M.R.]

3.25 **4731.2650 REPORTS; INDIVIDUAL MONITORING.**

4.1 A. This part applies to a person licensed by the commissioner to:

4.2 (1) ~~possess or use radioactive material for purposes of radiography~~  
4.3 ~~according to parts 4731.3000 to 4731.3175 and 4731.4000 to 4731.4360; or~~

4.4 (2) possess or use at any time for processing or manufacturing for  
4.5 distribution according to parts 4731.3000 to 4731.3175, 4731.3300 to 4731.3580, or  
4.6 4731.4400 to 4731.4527, radioactive material in quantities exceeding any one of the  
4.7 following quantities:

4.8	Radionuclide	Quantity of
4.9		Radionuclide in curies
4.10	Cesium-137	1
4.11	Cobalt-60	1
4.12	Gold-198	100
4.13	Iodine-131	1
4.14	Iridium-192	10
4.15	Krypton-85	1,000
4.16	Promethium-147	10
4.17	Technetium-99m	1,000

4.18 B. The commissioner may require ~~as a license condition or by order according~~  
4.19 ~~to part 4731.0200~~, reports from licensees who are licensed to use radionuclides not listed  
4.20 under item A, ~~subitem (2)~~, in quantities sufficient to cause comparable radiation levels.

4.21 C. A licensee under item A must submit an annual report of the results of  
4.22 individual monitoring carried out by the licensee for each individual for whom monitoring  
4.23 was required under part 4731.2210 during that year. The licensee may include additional  
4.24 data for individuals for whom monitoring was provided but not required. The licensee  
4.25 must use an NRC Form 5, or its equivalent, or electronic media containing all the  
4.26 information required by the NRC form, to file the report.

5.1 D. A licensee must file the report required under item C, covering the preceding  
5.2 year, on or before April 30 of each year. A licensee must submit the report to the  
5.3 commissioner.

5.4 **4731.4070 LEAK TESTING, REPLACEMENT, AND OTHER MODIFICATIONS**  
5.5 **OF SEALED SOURCES.**

5.6 [For text of subps 1 and 2, see M.R.]

5.7 Subp. 3. **Leaking source.**

5.8 [For text of items A and B, see M.R.]

5.9 C. A report must be filed with the commissioner, within five days, of any test  
5.10 with results that exceed the threshold in item A, describing the equipment involved, the  
5.11 test results, and corrective action taken. and must include:

5.12 (1) the model number and serial number, if assigned, of the leaking source;

5.13 (2) the identity of the radionuclide and its estimated activity;

5.14 (3) the results of the test;

5.15 (4) the date of the test; and

5.16 (5) the action taken.

5.17 [For text of subp 4, see M.R.]

5.18 **4731.4350 NOTIFICATIONS.**

5.19 Subpart 1. **Reports Immediate notification required.** In addition to the reporting  
5.20 required under part 4731.3110 and under other parts of this chapter, a licensee must  
5.21 provide a written report to the commissioner within 30 days of the occurrence of any of  
5.22 the following incidents involving radiographic equipment:

5.23 A. ~~unintentional disconnection of the source assembly from the control cable;~~

6.1 ~~B. inability to retract the source assembly to its fully shielded position and~~  
6.2 ~~secure it in the fully shielded position; or~~

6.3 ~~C. failure of any component, critical to safe operation of the device, to properly~~  
6.4 ~~perform its intended function;~~

6.5 A licensee must notify the commissioner as soon as possible but not later than four  
6.6 hours after the discovery of any event that prevents immediate protective actions necessary  
6.7 to avoid exposures to radiation or radioactive materials that could exceed regulatory limits  
6.8 or releases of licensed material that could exceed regulatory limits. Reportable events  
6.9 under this subpart include fires, explosions, toxic gas release, or similar hazards.

6.10 Subp. 2. 24-hour notification required information. ~~A licensee must include the~~  
6.11 ~~following information in each report submitted under subpart 1 and in each report of~~  
6.12 ~~overexposure submitted under part 4731.2620 that involves failure of safety components~~  
6.13 ~~of radiography equipment:~~

6.14 ~~A. a description of the equipment problem;~~

6.15 ~~B. the cause of each incident, if known;~~

6.16 ~~C. the name of the manufacturer and model number of equipment involved~~  
6.17 ~~in the incident;~~

6.18 ~~D. the place, date, and time of the incident;~~

6.19 ~~E. the actions taken to establish normal operations;~~

6.20 ~~F. the corrective actions taken or planned to prevent recurrence; and~~

6.21 ~~G. the qualifications of personnel involved in the incident;~~

6.22 A licensee must notify the commissioner within 24 hours after discovery of any of the  
6.23 following events involving licensed material:

6.24 A. the occurrence of any of the following incidents involving radiographic  
6.25 equipment:

7.1                   (1) unintentional disconnection of the source assembly from the control  
7.2 cable;

7.3                   (2) inability to retract the source assembly to its fully shielded position and  
7.4 secure it in the fully shielded position; or

7.5                   (3) failure of any component, critical to safe operation of the device, to  
7.6 properly perform its intended function;

7.7                   B. an event in which equipment is disabled or fails to function as designed when:

7.8                   (1) the equipment is required by rule or license condition to prevent  
7.9 releases exceeding regulatory limits, to prevent exposure to radiation and radioactive  
7.10 materials exceeding regulatory limits, or to mitigate the consequences of an accident;

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

7.13                   (3) no redundant equipment is available and operable to perform the  
7.14 required safety function;

7.15                   C. an unplanned contamination event that:

7.16                   (1) requires access to the contaminated area, by workers or the public, to  
7.17 be restricted for more than 24 hours by imposing additional radiological controls or by  
7.18 prohibiting entry into the areas;

7.19                   (2) involves a quantity of material greater than five times the lowest annual  
7.20 limit on intake specified in part 4731.2750 for the material; and

7.21                   (3) restricts access to the area for a reason other than to allow isotopes with  
7.22 a half-life of less than 24 hours to decay prior to decontamination;

8.1 D. an event that requires unplanned medical treatment at a medical facility of  
8.2 an individual with spreadable radioactive contamination on the individual's clothing or  
8.3 body; or

8.4 E. an unplanned fire or explosion that damages any licensed material or any  
8.5 device, container, or equipment containing licensed materials when:

8.6 (1) the quantity of material involved is five times the lowest annual limit  
8.7 on intake specified in part 4731.2750; and

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

8.9 ~~Subp. 3. Reporting unlisted use~~ Preparation and submission of notifications. A  
8.10 licensee conducting radiographic operations or storing radioactive material at any location  
8.11 not listed on the license for a period in excess of 180 days in a calendar year must notify  
8.12 the commissioner prior to exceeding the 180 days; must make notifications required  
8.13 under subparts 1 and 2 by telephone to the commissioner. To the extent the information is  
8.14 available at the time of notification, the information provided must include:

8.15 A. the caller's name and call-back telephone number;

8.16 B. a description of the event, including date and time;

8.17 C. the exact location of the event;

8.18 D. the isotopes, quantities, and chemical and physical form of the licensed  
8.19 material involved; and

8.20 E. any personnel radiation exposure data available.

8.21 Subp. 4. Reports required. A licensee who makes a notification required under  
8.22 subpart 1 or 2 must submit a written follow-up report within 30 days of the notification.  
8.23 Written reports prepared as required by other rules may be submitted to fulfill this  
8.24 requirement if the reports contain all of the necessary information and the appropriate  
8.25 distribution is made. The reports must be sent to the commissioner and include:

- 9.1            A. a description of the incident;
- 9.2            B. the cause of each incident, if known;
- 9.3            C. the name of the manufacturer and model number of equipment involved
- 9.4            in the incident;
- 9.5            D. the place, date, and time of the incident;
- 9.6            E. the actions taken to establish normal operations;
- 9.7            F. the corrective actions taken or planned to prevent recurrence;
- 9.8            G. the qualifications of personnel involved in the incident;
- 9.9            H. the isotopes, quantities, and chemical and physical form of the licensed
- 9.10           material involved;
- 9.11           I. the results of any evaluations or assessments; and
- 9.12           J. the extent of exposure of individuals to radiation or to radioactive materials,
- 9.13           without identification of the individuals by name.

9.14           Subp. 5. Reporting unlisted use. A licensee conducting radiographic operations or  
9.15           storing radioactive material at any location not listed on the license for a period in excess of  
9.16           180 days in a calendar year must notify the commissioner prior to exceeding the 180 days.

9.17           **4731.4411 RADIATION SAFETY OFFICER TRAINING.**

9.18                               [For text of subp 1, see M.R.]

9.19           Subp. 2. **Certification requirements.** A specialty board under subpart 1, item A,  
9.20           shall require all candidates for certification to:

9.21                               [For text of item A, see M.R.]



10.1 B. (1) hold a master's or doctor's degree in physics, medical physics, other  
10.2 physical science, engineering, or applied mathematics from an accredited college or  
10.3 university;

10.4 (2) have two years of full-time practical training or supervised experience  
10.5 in medical physics:

10.6 (a) under the supervision of a medical physicist who is certified in  
10.7 medical physics by a specialty board recognized by the NRC or an agreement state; or

10.8 (b) in clinical nuclear medicine facilities providing diagnostic or  
10.9 therapeutic services under the direction of physicians who meet the requirements for  
10.10 authorized users in part 4731.4414, 4731.4436, or 4731.4443; and

10.11 (3) pass an examination, administered by diplomates of the specialty board,  
10.12 that assesses knowledge and competence in clinical diagnostic radiological or nuclear  
10.13 medicine physics and in radiation safety.

10.14 **4731.4412 AUTHORIZED MEDICAL PHYSICIST TRAINING.**

10.15 Subpart 1. **Training and education requirements.** Except as provided in part  
10.16 4731.4414, a licensee must require an authorized medical physicist to be an individual  
10.17 who:

10.18 A. is certified by a specialty board whose certification process has been  
10.19 recognized by the NRC or an agreement state and:

10.20 (1) has obtained written attestation that the individual has satisfactorily  
10.21 completed the requirements in this item and subpart 2 and has achieved a level of  
10.22 competency sufficient to function independently as an authorized medical physicist for  
10.23 each type of therapeutic medical unit for which the individual is requesting authorized  
10.24 medical physicist status. The written attestation must be signed by a preceptor authorized  
10.25 medical physicist who meets the requirements in this part, part 4731.4414, or equivalent

11.1 NRC or agreement state requirements for an authorized medical physicist for each type  
11.2 of therapeutic medical unit for which the individual is requesting authorized medical  
11.3 physicist status; and

11.4 [For text of subitem (2), see M.R.]

11.5 B. (1) holds a master's or doctor's degree in physics, medical physics, other  
11.6 physical science, engineering, or applied mathematics from an accredited college or  
11.7 university, and:

11.8 [For text of units (a) and (b), see M.R.]

11.9 (2) has obtained written attestation that the individual has satisfactorily  
11.10 completed the requirements in this item and has achieved a level of competency sufficient  
11.11 to function independently as an authorized medical physicist for each type of therapeutic  
11.12 medical unit for which the individual is requesting authorized medical physicist status.  
11.13 The written attestation must be signed by a preceptor authorized medical physicist who  
11.14 meets the requirements in this part, part 4731.4414, or equivalent NRC or agreement state  
11.15 requirements for an authorized medical physicist for each type of therapeutic medical unit  
11.16 for which the individual is requesting authorized medical physicist status; and

11.17 [For text of subitem (3), see M.R.]

11.18 Subp. 2. **Certification requirements.** A specialty board under subpart 1, item A,  
11.19 shall require all candidates for certification to:

11.20 [For text of item A, see M.R.]

11.21 B. have two years of full-time practical training or supervised experience in  
11.22 medical physics:

11.23 (1) under the supervision of a medical physicist who is certified in medical  
11.24 physics by a specialty board recognized by the commissioner, the NRC, or an agreement  
11.25 state; or

12.1 (2) in clinical radiation facilities providing high-energy, external beam  
12.2 therapy (photons and electrons with energies greater than or equal to 1,000,000 electron  
12.3 volts) and brachytherapy services under the direction of physicians who meet the  
12.4 requirements for authorized users in part 4731.4414, 4731.4458, or 4731.4479; and

12.5 [For text of item C, see M.R.]

12.6 **4731.4414 TRAINING; EXPERIENCED RADIATION SAFETY OFFICER,**  
12.7 **TELE THERAPY OR MEDICAL PHYSICIST, AUTHORIZED USER, AND**  
12.8 **NUCLEAR PHARMACIST.**

12.9 [For text of items A to D, see M.R.]

12.10 E. Individuals who need not comply with training requirements described in  
12.11 this part may serve as preceptors for, and supervisors of, applicants seeking authorization  
12.12 on licenses issued under this chapter for the same uses for which these individuals are  
12.13 authorized.

12.14 **4731.4430 CONTROL OF AEROSOLS AND GASES.**

12.15 Subpart 1. Collection system. A licensee who administers radioactive aerosols or  
12.16 gases must do so with a system that will keep airborne concentrations within the limits  
12.17 prescribed by parts 4731.2020 and 4731.2090.

12.18 Subp. 2. System vented or system collection. The system must either be directly  
12.19 vented to the atmosphere through an air exhaust or provide for collection and decay or  
12.20 disposal of the aerosol or gas in a shielded container.

12.21 Subp. 3. Negative pressure required. A licensee must only administer radioactive  
12.22 gases in rooms that are at negative pressure compared to surrounding rooms.

12.23 Subp. 4. Calculation of time needed after a release. Before receiving, using, or  
12.24 storing a radioactive gas, the licensee must calculate the amount of time needed after a  
12.25 release to reduce the concentration in the area of use to the occupational limit listed in

13.1 part 4731.2750. The calculation must be based on the highest activity of gas handled in a  
13.2 single container and the measured available air exhaust rate.

13.3 Subp. 5. Posting time needed after a release. A licensee must post the time needed  
13.4 after a release to reduce the concentration to the occupational limit calculated for the area  
13.5 of use and require that, in case of a gas spill, individuals evacuate the room until the  
13.6 posted time has elapsed.

13.7 Subp. 6. Monthly check on collection system. A licensee must check the operation  
13.8 of collection systems monthly and measure the ventilation rates in areas of use at intervals  
13.9 not to exceed six months.

13.10 Subp. 7. Records retention. Records of these checks and measurements must be  
13.11 maintained for three years.

13.12 **4731.4433 UPTAKE, DILUTION, AND EXCRETION STUDIES; TRAINING.**

13.13 Subpart 1. **Training and education requirements.** Except as provided under part  
13.14 4731.4414, a licensee must require the authorized user of unsealed radioactive material for  
13.15 the uses authorized under part 4731.4432 to be a physician who:

13.16 A. is certified by a medical specialty board whose certification process has been  
13.17 recognized by the NRC or an agreement state and has obtained written attestation, signed  
13.18 by a preceptor authorized user who meets the requirements of this part, part 4731.4414,  
13.19 4731.4436, or 4731.4443, or equivalent requirements of the NRC or an agreement state,  
13.20 that the individual has satisfactorily completed the requirements in subpart 2 and has  
13.21 achieved a level of competency sufficient to function independently as an authorized user  
13.22 for the medical uses authorized under part 4731.4432;

13.23 B. is an authorized user under part 4731.4436 or 4731.4443 or under equivalent  
13.24 requirements of the NRC or an agreement state; or

13.25 C. has:

14.1 (1) completed 60 hours of training and experience, including a minimum of  
14.2 eight hours of classroom and laboratory training, in basic radionuclide handling techniques  
14.3 applicable to the medical use of unsealed radioactive material for uptake, dilution, and  
14.4 excretion studies. The training and experience must include:

14.5 [For text of unit (a), see M.R.]

14.6 (b) work experience, under the supervision of an authorized user who  
14.7 meets the requirements ~~under in~~ this part, part 4731.4414, 4731.4436<sub>2</sub> or 4731.4443, or  
14.8 equivalent requirements of the NRC or an agreement state, involving:

14.9 [For text of subunits i to vi, see M.R.]

14.10 (2) obtained written attestation, signed by a preceptor authorized user  
14.11 who meets the requirements of this part, part 4731.4414, 4731.4436<sub>2</sub> or 4731.4443,  
14.12 or equivalent requirements of the NRC or an agreement state, that the individual has  
14.13 satisfactorily completed the requirements in this item and has achieved a level of  
14.14 competency sufficient to function independently as an authorized user for the medical uses  
14.15 authorized under part 4731.4432.

14.16 [For text of subp 2, see M.R.]

14.17 **4731.4436 IMAGING AND LOCALIZATION STUDIES; TRAINING.**

14.18 Subpart 1. **Training and education requirements.** Except as provided under part  
14.19 4731.4414, a licensee must require an authorized user of unsealed radioactive material for  
14.20 the uses authorized under part 4731.4434 to be a physician who is qualified as follows  
14.21 under item A, B, or C:

14.22 A. The physician must:

14.23 (1) is be certified by a medical specialty board whose certification process  
14.24 has been recognized by the NRC or an agreement state ~~and has;~~

15.1                   (2) ~~must also have obtained written attestation, signed by a preceptor~~  
15.2 ~~authorized user who meets the requirements in this part; or in item C, subitem (1), unit (b),~~  
15.3 ~~subunit vii, and part 4731.4443; or equivalent requirements of the NRC or an agreement~~  
15.4 ~~state, that the individual physician has satisfactorily completed the requirements in subpart~~  
15.5 ~~2 and has achieved a level of competency sufficient to function independently as an~~  
15.6 ~~authorized user for the medical uses authorized under parts 4731.4432 and 4731.4434;~~  
15.7 The attestation must be signed by a preceptor authorized user who meets:

15.8                   (a) the requirements in this part; or

15.9                   (b) the requirements in item C, subitem (1), unit (b), subunit vii, and  
15.10 part 4731.4443;

15.11                  (c) the requirements in part 4731.4414; or

15.12                  (d) equivalent requirements of the NRC or an agreement state.

15.13                  B. ~~is~~ The physician must be an authorized user under part 4731.4443 and  
15.14 meets meet the requirements in item C, subitem (1), unit (b), subunit vii, or equivalent  
15.15 requirements of the NRC or an agreement state; or

15.16                  C. ~~has~~ The physician must have:

15.17                   (1) completed 700 hours of training and experience, including a minimum  
15.18 of 80 hours of classroom and laboratory training, in basic radionuclide handling techniques  
15.19 applicable to the medical use of unsealed radioactive material for imaging and localization  
15.20 studies. The training and experience must include, at a minimum:

15.21   [For text of unit (a), see M.R.]

15.22                   (b) work experience, under the supervision of an authorized user who  
15.23 meets the requirements ~~under in~~ this part, part 4731.4414, or in subunit vii and part  
15.24 4731.4443; or equivalent requirements of the NRC or an agreement state, involving:

15.25   [For text of subunits i to vii, see M.R.]

16.1 (2) ~~obtained written attestation, signed by a preceptor authorized user~~  
16.2 ~~who meets the requirements in this part, or in subitem (1), unit (b), subunit vii, and~~  
16.3 ~~part 4731.4443; or equivalent requirements of the NRC or an agreement state; that the~~  
16.4 individual physician has satisfactorily completed the requirements in this item and has  
16.5 achieved a level of competency sufficient to function independently as an authorized user  
16.6 for the medical uses authorized under parts 4731.4432 and 4731.4434. The attestation  
16.7 must be signed by a preceptor authorized user who meets:

16.8 (a) the requirements in this part; or

16.9 (b) the requirements in subitem (1), unit (b), subunit vii, and part  
16.10 4731.4443;

16.11 (c) the requirements in part 4731.4414; or

16.12 (d) equivalent requirements of the NRC or an agreement state.

16.13 Subp. 2. **Certification requirements.** A specialty board shall require all candidates  
16.14 for certification to:

16.15 A. complete 700 hours of training and experience in basic radionuclide handling  
16.16 techniques and radiation safety applicable to the medical use of unsealed radioactive  
16.17 material for imaging and localization studies that include the topics listed in subpart 1,  
16.18 item C, subitem (1), units (a) and (b); and

16.19 B. pass an examination administered by diplomates of the specialty board,  
16.20 which assesses knowledge and competence in radiation safety, radionuclide handling,  
16.21 and quality control.

16.22 **4731.4443 UNSEALED RADIOACTIVE MATERIAL; WRITTEN DIRECTIVE**  
16.23 **REQUIRED; TRAINING.**

17.1 Subpart 1. **Training and education requirements.** Except as provided under part  
17.2 4731.4414, a licensee must require an authorized user of unsealed radioactive material for  
17.3 the uses authorized under part 4731.4440 to be a physician who:

17.4 A. is certified by a medical specialty board whose certification process has  
17.5 been recognized by the NRC or an agreement state, meets the requirements in item B,  
17.6 subitem (1), unit (b), subunit vi, and has obtained written attestation that the individual  
17.7 has satisfactorily completed the requirements in this item and subpart 2 and has achieved  
17.8 a level of competency sufficient to function independently as an authorized user for the  
17.9 medical uses authorized under part 4731.4440. The written attestation must be signed by  
17.10 a preceptor authorized user who meets the requirements of this part, part 4731.4414, or  
17.11 equivalent requirements of the NRC or an agreement state. A preceptor authorized user  
17.12 who meets the requirements in item B must also have experience in administering dosages  
17.13 in the same dosage category or categories under item B, subitem (1), unit (b), subunit vi,  
17.14 as the individual requesting authorized user status; or

17.15 B. has:

17.16 (1) completed 700 hours of training and experience, including a minimum  
17.17 of 200 hours of classroom and laboratory training, in basic radionuclide handling  
17.18 techniques applicable to the medical use of unsealed radioactive material requiring a  
17.19 written directive. The training and experience must include:

17.20 [For text of unit (a), see M.R.]

17.21 (b) work experience, under the supervision of an authorized user who  
17.22 meets the requirements in this part, part 4731.4414, or equivalent requirements of the  
17.23 NRC or an agreement state. A supervising authorized user who meets the requirements in  
17.24 this item must also have experience in administering dosages in the same dosage category  
17.25 or categories under subunit vi as the individual requesting authorized user status. The  
17.26 work experience must involve:



18.1 [For text of subunits i to vi, see M.R.]

18.2 (2) obtained written attestation that the individual has satisfactorily  
18.3 completed the requirements in this item and has achieved a level of competency sufficient  
18.4 to function independently as an authorized user for the medical uses authorized under part  
18.5 4731.4440. The written attestation must be signed by a preceptor authorized user who  
18.6 meets the requirements of this part, part 4731.4414, or equivalent requirements of the  
18.7 NRC or an agreement state. A preceptor authorized user who meets the requirements  
18.8 in this item must also have experience in administering dosages in the same dosage  
18.9 category or categories under subitem (1), unit (b), subunit vi, as the individual requesting  
18.10 authorized user status.

18.11 [For text of subp 2, see M.R.]

18.12 **4731.4444 ORAL ADMINISTRATION OF SODIUM IODIDE I-131; QUANTITIES**  
18.13 **LESS THAN OR EQUAL TO 33 MILLICURIES (1.22 GBq); WRITTEN**  
18.14 **DIRECTIVE REQUIRED; TRAINING.**

18.15 Except as provided under part 4731.4414, a licensee must require an authorized  
18.16 user for the oral administration of sodium iodide (I-131) requiring a written directive in  
18.17 quantities less than or equal to 33 millicuries (1.22 GBq) to be a physician who:

18.18 A. is certified by a medical specialty board whose certification process has been  
18.19 recognized by the NRC or an agreement state and includes all of the requirements of  
18.20 item C, subitems (1) and (2), and who has obtained written attestation that the individual  
18.21 has satisfactorily completed the requirements of item C, subitems (1) and (2), and has  
18.22 achieved a level of competency sufficient to function independently as an authorized user  
18.23 for medical uses authorized under part 4731.4440. The written attestation must be signed  
18.24 by a preceptor authorized user who meets the requirements of this part, part 4731.4414,  
18.25 4731.4443, or 4731.4445, or equivalent requirements of the NRC or an agreement state. A  
18.26 preceptor authorized user who meets the requirement in part 4731.4443, subpart 1, item B,  
18.27 must also have experience in oral administration of less than or equal to 33 millicuries

19.1 (1.22 GBq) of sodium iodide (I-131) for which a written directive is required or oral  
19.2 administration of greater than 33 millicuries (1.22 GBq) of sodium iodide (I-131) as  
19.3 specified in part 4731.4443, subpart 1, item B, subitem (1), unit (b), subunit vi;

19.4 [For text of item B, see M.R.]

19.5 C. has:

19.6 [For text of subitem (1), see M.R.]

19.7 (2) work experience under the supervision of an authorized user who meets  
19.8 the requirements of this part, part 4731.4414, 4731.4443, or 4731.4445, or equivalent  
19.9 requirements of the NRC or an agreement state. A supervising authorized user who meets  
19.10 the requirements in part 4731.4443, subpart 1, item B, must also have experience in  
19.11 oral administration of less than or equal to 33 millicuries (1.22 GBq) of sodium iodide  
19.12 (I-131) for which a written directive is required or oral administration of greater than 33  
19.13 millicuries (1.22 GBq) of sodium iodide (I-131) as specified in part 4731.4443. The  
19.14 work experience must involve:

19.15 [For text of units (a) to (f), see M.R.]

19.16 (3) obtained written attestation that the individual has satisfactorily  
19.17 completed the requirements of this item and has achieved a level of competency sufficient  
19.18 to function independently as an authorized user for medical uses authorized under  
19.19 part 4731.4440. The written attestation must be signed by a preceptor authorized user  
19.20 who meets the requirements of this part, part 4731.4414, 4731.4443, or 4731.4445, or  
19.21 equivalent requirements of the NRC or an agreement state. A preceptor authorized user  
19.22 who meets the requirement in part 4731.4443, subpart 1, item B, must also have experience  
19.23 in oral administration of less than or equal to 33 millicuries (1.22 GBq) of sodium iodide  
19.24 (I-131) for which a written directive is required or oral administration of greater than 33  
19.25 millicuries (1.22 GBq) of sodium iodide (I-131) as specified in part 4731.4443.

20.1 **4731.4445 ORAL ADMINISTRATION OF SODIUM IODIDE; QUANTITIES**  
20.2 **GREATER THAN 33 MILLICURIES (1.22 GBq); WRITTEN DIRECTIVE**  
20.3 **REQUIRED; TRAINING.**

20.4 Except as provided under part 4731.4414, a licensee must require an authorized  
20.5 user for the oral administration of sodium iodide (I-131) requiring a written directive in  
20.6 quantities greater than 33 millicuries (1.22 GBq) to be a physician who:

20.7 A. is certified by a medical specialty board whose certification process has  
20.8 been recognized by the NRC or an agreement state and includes all the requirements in  
20.9 item C, subitems (1) and (2), and who has obtained written attestation that the individual  
20.10 has satisfactorily completed the requirements of this item and has achieved a level of  
20.11 competency sufficient to function independently as an authorized user for medical uses  
20.12 authorized under part 4731.4440. The written attestation must be signed by a preceptor  
20.13 authorized user who meets the requirements in this part, part 4731.4414 or 4731.4443,  
20.14 or equivalent requirements of the NRC or an agreement state. A preceptor authorized  
20.15 user who meets the requirements in part 4731.4443, subpart 1, item B, must also have  
20.16 experience in the oral administration of I-131 in quantities greater than 33 millicuries as  
20.17 specified in part 4731.4443, subpart 1, item B, subitem (1), unit (b), subunit vi;

20.18 [For text of item B, see M.R.]

20.19 C. has:

20.20 [For text of subitem (1), see M.R.]

20.21 (2) has work experience, under the supervision of an authorized user who  
20.22 meets the requirements under of this part, part 4731.4414 or 4731.4443, subpart 1, item  
20.23 A or B, or equivalent requirements of the NRC or an agreement state. A supervising  
20.24 authorized user who meets the requirements in part 4731.4443, subpart 1, item B, must  
20.25 also have experience in the oral administration of I-131 in quantities greater than 33  
20.26 millicuries under part 4731.4443, subpart 1, item B, subitem (1), unit (b), subunit vi. The  
20.27 work experience must involve:

21.1 [For text of units (a) to (f), see M.R.]

21.2 (3) obtained written attestation that the individual has satisfactorily  
21.3 completed the requirements of this item and has achieved a level of competency sufficient  
21.4 to function independently as an authorized user for medical uses authorized under  
21.5 part 4731.4440. The written attestation must be signed by a preceptor authorized user  
21.6 who meets the requirements in this part, part 4731.4414 or 4731.4443, or equivalent  
21.7 requirements of the NRC or an agreement state. A preceptor authorized user who meets  
21.8 the requirements in part 4731.4443, subpart 1, item B, must also have experience in the  
21.9 oral administration of I-131 in quantities greater than 33 millicuries under part 4731.4443,  
21.10 subpart 1, item B, subitem (1), unit (b), subunit vi.

21.11 **4731.4446 PARENTERAL ADMINISTRATION OF UNSEALED RADIOACTIVE**  
21.12 **MATERIAL; WRITTEN DIRECTIVE REQUIRED; TRAINING.**

21.13 [For text of item A, see M.R.]

21.14 B. The physician under item A, subitems (2) and (3), must have:

21.15 [For text of subitem (1), see M.R.]

21.16 (2) work experience, under the supervision of an authorized user who  
21.17 meets the requirements in this part or, part 4731.4414 or 4731.4443, or equivalent  
21.18 requirements of the NRC or agreement state, in the parenteral administration, for which a  
21.19 written directive is required, of any beta emitter, or any photon-emitting radionuclide with  
21.20 a photon energy less than 150 keV or parenteral administration of any other radionuclide  
21.21 for which a written directive is required. A supervising authorized user who meets the  
21.22 requirements in part 4731.4443 must have experience in parenteral administration of any  
21.23 beta emitter, or a photon-emitting radionuclide with a photon energy less than 150 kilo  
21.24 electron volts for which a written directive is required or parenteral administration of any  
21.25 other radionuclide for which a written directive is required as specified in part 4731.4443,  
21.26 subpart 1, item B, subitem (1), unit (b), subunit vi. The work experience must involve:

22.1 [For text of units (a) to (f), see M.R.]

22.2 (3) obtained written attestation that the individual has satisfactorily  
22.3 completed the requirements in this item and item A, subitem (2) or (3), and has achieved  
22.4 a level of competency sufficient to function independently as an authorized user for the  
22.5 parenteral administration of unsealed radioactive material requiring a written directive.  
22.6 The written attestation must be signed by a preceptor authorized user who meets the  
22.7 requirements in this part, part 4731.4414, or 4731.4443, or equivalent requirements of  
22.8 the NRC or agreement state. A preceptor authorized user who meets the requirements in  
22.9 part 4731.4443 must have experience in parenteral administration of any beta emitter, or a  
22.10 photon-emitting radionuclide with a photon energy less than 150 kilo electron volts for  
22.11 which a written directive is required or parenteral administration of any other radionuclide  
22.12 for which a written directive is required as specified in part 4731.4443, subpart 1, item B,  
22.13 subitem (1), unit (b), subunit vi.

22.14 **4731.4458 MANUAL BRACHYTHERAPY TRAINING.**

22.15 Subpart 1. **Training and education requirements.** Except as provided under part  
22.16 4731.4414, a licensee must require an authorized user of a manual brachytherapy source  
22.17 for the uses authorized under part 4731.4450 to be a physician who:

22.18 A. is certified by a medical specialty board whose certification has been  
22.19 recognized by the NRC or an agreement state and has obtained written attestation,  
22.20 signed by a preceptor authorized user who meets the requirements of this part, part  
22.21 4731.4414, or equivalent requirements of the NRC or an agreement state, that the  
22.22 individual has satisfactorily completed the requirements of subpart 2 and has achieved a  
22.23 level of competency sufficient to function independently as an authorized user of manual  
22.24 brachytherapy sources for the medical uses authorized under part 4731.4450; or

22.25 B. has:

23.1 (1) completed a structured educational program in basic radionuclide  
23.2 handling techniques applicable to the use of manual brachytherapy sources that includes:

23.3 [For text of unit (a), see M.R.]

23.4 (b) 500 hours of work experience, under the supervision of an  
23.5 authorized user who meets the requirements ~~under~~ in this part, part 4731.4414, or  
23.6 equivalent requirements of the NRC or an agreement state at a medical institution,  
23.7 involving:

23.8 [For text of subunits i to vi, see M.R.]

23.9 (2) completed three years of supervised clinical experience in radiation  
23.10 oncology, under an authorized user who meets the requirements of this part, part  
23.11 4731.4414, or equivalent requirements of the NRC or an agreement state, as part of a  
23.12 formal training program approved by the Residency Review Committee for Radiation  
23.13 Oncology of the Accreditation Council for Graduate Medical Education, the Royal College  
23.14 of Physicians and Surgeons of Canada, or the Committee on Postgraduate Postdoctoral  
23.15 Training of the American Osteopathic Association. This experience may be obtained  
23.16 concurrently with the supervised work experience required under subitem (1), unit (b); and

23.17 (3) obtained written attestation, signed by a preceptor authorized user  
23.18 who meets the requirements of this part, part 4731.4414, or equivalent requirements  
23.19 of the NRC or an agreement state, that the individual has satisfactorily completed the  
23.20 requirements of this item and has achieved a level of competency sufficient to function  
23.21 independently as an authorized user of manual brachytherapy sources for the medical uses  
23.22 authorized under part 4731.4450.

23.23 [For text of subp 2, see M.R.]

23.24 **4731.4459 OPTHALMIC USE OF STRONTIUM-90; TRAINING.**

24.1 Except as provided under part 4731.4414, a licensee must require an authorized user  
24.2 of strontium-90 for ophthalmic radiotherapy to be a physician who:

24.3 A. is an authorized user under part 4731.4458 or equivalent requirements of the  
24.4 NRC or an agreement state; or

24.5 B. has:

24.6 [For text of subitems (1) and (2), see M.R.]

24.7 (3) obtained written attestation, signed by a preceptor authorized user  
24.8 who meets the requirements of this part, part 4731.4414, or 4731.4458, or equivalent  
24.9 requirements of the NRC or an agreement state, that the individual has satisfactorily  
24.10 completed the requirements in this item and has achieved a level of competency sufficient  
24.11 to function independently as an authorized user of strontium-90 for ophthalmic use.

24.12 **4731.4479 REMOTE AFTERLOADER UNITS, TELETHERAPY UNITS, AND**  
24.13 **GAMMA STEREOTACTIC RADIOSURGERY UNITS; TRAINING.**

24.14 Subpart 1. **Training and education requirements.** Except as provided under  
24.15 part 4731.4414, a licensee must require an authorized user of a sealed source for a use  
24.16 authorized under part 4731.4463 to be a physician who:

24.17 A. is certified by a medical specialty board whose certification process has been  
24.18 recognized by the NRC or an agreement state, meets the requirements in item B, subitem  
24.19 (4), and has obtained written attestation that the individual has satisfactorily completed  
24.20 the requirements in this item and subpart 2 and has achieved a level of competency  
24.21 sufficient to function independently as an authorized user of each type of therapeutic  
24.22 medical unit for which the individual is requesting authorized user status. The written  
24.23 attestation must be signed by a preceptor authorized user who meets the requirements of  
24.24 this part, part 4731.4414, or equivalent requirements of the NRC or an agreement state for  
24.25 an authorized user for each type of therapeutic medical unit for which the individual is  
24.26 requesting authorized user status; or

25.1 B. has:

25.2 (1) completed a structured educational program in basic radionuclide  
25.3 techniques applicable to the use of a sealed source in a therapeutic medical unit that  
25.4 includes:

25.5 [For text of unit (a), see M.R.]

25.6 (b) 500 hours of work experience, under the supervision of an  
25.7 authorized user who meets the requirements of this part, part 4731.4414, or equivalent  
25.8 requirements of the NRC or an agreement state, at a medical institution involving:

25.9 [For text of subunits i to vi, see M.R.]

25.10 (2) completed three years of supervised clinical experience in radiation  
25.11 therapy, under an authorized user who meets the requirements of this part, part 4731.4414,  
25.12 or equivalent requirements of the NRC or an agreement state, as part of a formal training  
25.13 program approved by the Residency Review Committee for Radiation Oncology of the  
25.14 Accreditation Council for Graduate Medical Education, the Royal College of Physicians  
25.15 and Surgeons of Canada, or the Committee on ~~Postgraduate~~ Postdoctoral Training of the  
25.16 American Osteopathic Association. The experience may be obtained concurrently with  
25.17 the supervised work experience required under subitem (1), unit (b);

25.18 (3) obtained written attestation that the individual has satisfactorily  
25.19 completed the requirements in this item and has achieved a level of competency sufficient  
25.20 to function independently as an authorized user of each type of therapeutic medical unit  
25.21 for which the individual is requesting authorized user status. The written attestation must  
25.22 be signed by a preceptor authorized user who meets the requirements of this part, part  
25.23 4731.4414, or equivalent requirements of the NRC or an agreement state for an authorized  
25.24 user for each type of therapeutic medical unit for which the individual is requesting  
25.25 authorized user status; and



26.1 [For text of subitem (4), see M.R.]

26.2 [For text of subp 2, see M.R.]

26.3 **4731.4525 MEDICAL EVENT; REPORT AND NOTIFICATION.**

26.4 [For text of subps 1 and 2, see M.R.]

26.5 Subp. 3. ~~Telephone~~ 24-hour notification required. A licensee must notify the  
26.6 commissioner ~~by telephone no later than the next calendar day~~ within 24 hours after  
26.7 discovery of a medical event.

26.8 [For text of subps 4 to 7, see M.R.]

26.9 **4731.4526 DOSE TO AN EMBRYO/FETUS OR CHILD; REPORT AND**  
26.10 **NOTIFICATION.**

26.11 [For text of subps 1 and 2, see M.R.]

26.12 Subp. 3. ~~Telephone~~ 24-hour notification required. A licensee must notify the  
26.13 commissioner ~~by telephone no later than the next calendar day~~ within 24 hours after  
26.14 discovery of a dose to an embryo/fetus or nursing child that requires a report under  
26.15 subpart 1 or 2.

26.16 [For text of subps 4 to 6, see M.R.]

26.17 **4731.4600 DEFINITIONS.**

26.18 Subpart 1. Scope. The following definitions apply to parts 4731.4605 to 4731.4620.

26.19 Subp. 2. Accredited. "Accredited" means an individual who has satisfactorily  
26.20 completed a nationally recognized examination in nuclear medicine and who maintains  
26.21 the registration or certification of the examining organization. Nationally recognized  
26.22 examinations are provided by the following organizations:

26.23 A. the American Registry of Radiologic Technologists (N) (ARRT);

27.1 B. the Nuclear Medicine Technology Certification Board (NMTCB); or

27.2 C. the American Society of Clinical Pathologists (NM) (ASCP).

27.3 Subp. 3. Nuclear medicine technologist. "Nuclear medicine technologist"  
27.4 means a person other than a licensed practitioner of the healing arts who administers  
27.5 radiopharmaceuticals and related drugs to human beings for diagnostic purposes,  
27.6 performs in vivo and in vitro detection and measurement of radioactivity, and administers  
27.7 radiopharmaceuticals to human beings for therapeutic purposes. A nuclear medicine  
27.8 technologist may perform such procedures only while under the general supervision of  
27.9 a licensed practitioner of the healing arts who is licensed to possess and use radioactive  
27.10 materials.

27.11 4731.4605 MINIMUM STANDARDS FOR NUCLEAR MEDICINE  
27.12 TECHNOLOGISTS.

27.13 Subpart 1. General requirements. Except as specified in part 4731.4610, any  
27.14 individual working as a nuclear medicine technologist in Minnesota must meet the  
27.15 following minimum eligibility requirements:

27.16 A. graduation from high school or its equivalent;

27.17 B. attainment of 18 years of age; and

27.18 C. ability to adequately perform necessary duties without posing a hazard to the  
27.19 health or safety of patients, other employees, or members of the public.

27.20 Subp. 2. Accreditation required. Except as specified in part 4731.4610, any  
27.21 individual working as a nuclear medicine technologist in Minnesota after January 1,  
27.22 2011, must be accredited.

27.23 Subp. 3. Record retention. The licensee must retain documentation of accreditation  
27.24 for five years and make it available for inspection by the department.

27.25 4731.4610 EXCEPTIONS.

28.1 The individuals in items A to E are exempt from the examination requirement in  
28.2 part 4731.4600, subpart 3:

28.3 A. a licensed practitioner of the healing arts who is listed as an authorized  
28.4 user on an agreement state or United States Nuclear Regulatory Commission radioactive  
28.5 materials license;

28.6 B. individuals working as nuclear medicine technologists under the direct  
28.7 supervision of an individual who is accredited in nuclear medicine or by a physician who  
28.8 appears as an authorized user on an agreement state or United States Nuclear Regulatory  
28.9 Commission radioactive materials license;

28.10 C. students enrolled in and participating in an accredited program for nuclear  
28.11 medicine technology or a school of medicine, osteopathy, podiatry, or chiropractic who, as  
28.12 a part of the students' course of study, administers radioactive material during supervised  
28.13 clinical experience; or

28.14 D. an individual working as a nuclear medicine technologist before January  
28.15 1, 2011, who is not accredited, provided the individual has completed the training in  
28.16 part 4731.4612.

28.17 **4731.4612 TRAINING FOR INDIVIDUALS FUNCTIONING AS A NUCLEAR**  
28.18 **MEDICINE TECHNOLOGIST BEFORE JANUARY 1, 2011, WHO ARE NOT**  
28.19 **ACCREDITED.**

28.20 Subpart 1. Training program. Individuals working as a nuclear medicine  
28.21 technologist before January 1, 2011, who are not accredited must complete a training  
28.22 program designed to demonstrate competency in the following areas:

28.23 A. patient and personnel protection including:

28.24 (1) biological effects of radiation;

28.25 (2) basic concepts of radiation protection; and

- 29.1                   (3) Minnesota Department of Health rules for radiation exposure;
- 29.2                   B. radiopharmaceutical characteristics including:
- 29.3                   (1) half-life;
- 29.4                   (2) method of localization; and
- 29.5                   (3) biodistribution;
- 29.6                   C. proper handling of radioactive materials including:
- 29.7                   (1) inspection and survey of packages;
- 29.8                   (2) storage of radioactive material;
- 29.9                   (3) disposal of radioactive waste; and
- 29.10                  (4) United States Department of Transportation training requirements for
- 29.11                  shippers;
- 29.12                  D. factors affecting image quality including:
- 29.13                  (1) equipment;
- 29.14                  (2) patient and detector orientation;
- 29.15                  (3) patient anatomical factors;
- 29.16                  (4) anatomical landmarks;
- 29.17                  (5) immobilization techniques; and
- 29.18                  (6) radiopharmaceuticals;
- 29.19                  E. facility monitoring including:
- 29.20                  (1) survey equipment operation and uses; and
- 29.21                  (2) radioactive spill responses; and

30.1 F. administration of radiopharmaceuticals as determined during supervised  
30.2 clinical experience.

30.3 Subp. 2. Clinical experience. Clinical experience must be supervised by an  
30.4 individual who is accredited in nuclear medicine or by a physician who appears as an  
30.5 authorized user on an agreement state or United States Nuclear Regulatory Commission  
30.6 radioactive materials license.

30.7 Subp. 3. Restrictions during training. Individuals in a training program  
30.8 indicated in subpart 1 cannot work as a nuclear medicine technologist before obtaining  
30.9 documentation of competency as required in part 4731.4615 unless the individual works  
30.10 under the direct supervision of:

30.11 A. an individual who is accredited in nuclear medicine; or

30.12 B. a physician who appears as an authorized user on an agreement state or  
30.13 United States Nuclear Regulatory Commission radioactive materials license.

30.14 Subp. 4. Continuing education. Individuals working as nuclear medicine  
30.15 technologists before January 1, 2011, who are not accredited must:

30.16 A. obtain 24 hours of continuing education on nuclear medicine every 24  
30.17 months;

30.18 B. have the continuing education training approved by any of the organizations  
30.19 listed in part 4731.4600, subpart 3; and

30.20 C. retain documentation of continuing education for five years and make it  
30.21 available for inspection by the department.

30.22 **4731.4615 DOCUMENTATION OF COMPETENCY.**

30.23 Subpart 1. Nuclear medicine technologist; January 1, 2011. An individual  
30.24 functioning as a nuclear medicine technologist prior to January 1, 2011, and who is

31.1 not accredited must obtain documentation that the individual is competent to applying  
31.2 ionizing radiation to human beings.

31.3 Subp. 2. Who can document competency. The documentation of competency must  
31.4 be provided by a licensed practitioner of the healing arts under whose general supervision  
31.5 the individual is employed or has been employed.

31.6 Subp. 3. Procedures and equipment. The documentation of competency must  
31.7 specify the nature of procedures and the equipment the individual is competent to utilize  
31.8 and must be limited to work performed before January 1, 2011.

31.9 Subp. 4. Record retention. The documentation of competency must be retained by  
31.10 the individual for inspection by the department.

31.11 4731.4620 REQUIREMENTS FOR OPERATORS OF FUSION IMAGING  
31.12 DEVICES.

31.13 Subpart 1. Accreditation required. When a unit is operated as a fusion imaging  
31.14 device or in a dual mode such as a SPECT/CT or PET/CT device, the operator must be  
31.15 accredited or must meet the requirements in chapter 4732.

31.16 Subp. 2. Diagnostic CT imaging device. When the unit is operated as a stand-alone  
31.17 diagnostic CT imaging device, the operator must meet the requirements in chapter 4732.

1.1 **Department of Health**1.2 **Adopted Permanent Rules Relating to Radiation Safety**

1.3 The rules proposed and published at State Register, Volume 35, Number 11, pages  
1.4 421-437, September 13, 2010 (35 SR 421), are adopted with the following modifications:

1.5 **4731.4436 IMAGING AND LOCALIZATION STUDIES; TRAINING.**

1.6 Subpart 1. **Training and education requirements.** Except as provided under part  
1.7 4731.4414, a licensee must require an authorized user of unsealed radioactive material for  
1.8 the uses authorized under part 4731.4434 to be a physician who is qualified as follows  
1.9 under item A, B, or C:

1.10 A. The physician must:

1.11 (2) must also have obtained written attestation that the individual physician  
1.12 has satisfactorily completed the requirements in subpart 2 and has achieved a level of  
1.13 competency sufficient to function independently as an authorized user for the medical  
1.14 uses authorized under parts 4731.4432 and 4731.4434. The attestation must be signed  
1.15 by a preceptor authorized user who meets:

1.16 (a) the requirements in this part; ~~or~~

1.17 C. The physician must have:

1.18 (2) obtained written attestation that the individual physician has  
1.19 satisfactorily completed the requirements in this item and has achieved a level of  
1.20 competency sufficient to function independently as an authorized user for the medical  
1.21 uses authorized under parts 4731.4432 and 4731.4434. The attestation must be signed  
1.22 by a preceptor authorized user who meets:

1.23 (a) the requirements in this part; ~~or~~

1.24 **4731.4600 DEFINITIONS.**

2.1 Subp. 4. Direct supervision. "Direct supervision" means an accredited nuclear  
2.2 medicine technologist or an authorized user currently listed on an agreement state or  
2.3 United States Nuclear Regulatory Commission radioactive materials license is physically  
2.4 present in the facility and available to respond.

2.5 **4731.4605 MINIMUM STANDARDS FOR NUCLEAR MEDICINE**  
2.6 **TECHNOLOGISTS.**

2.7 Subp. 2. **Accreditation required.** Except as specified in part 4731.4610, any  
2.8 individual working as a nuclear medicine technologist in Minnesota on or after January 1,  
2.9 2011, must be accredited.

2.10 Subp. 3. **Record retention.** The licensee must retain documentation of accreditation  
2.11 for five years and make it available for inspection upon request by the department.

2.12 **4731.4610 EXCEPTIONS.**

2.13 The individuals in items A to E D are exempt from the examination requirement  
2.14 in part 4731.4600, subpart ~~3~~ 2:

2.15 B. individuals working as nuclear medicine technologists under the direct  
2.16 supervision of: (1) an individual who is accredited in nuclear medicine; or by (2) a  
2.17 physician who appears as an authorized user on an agreement state or United States  
2.18 Nuclear Regulatory Commission radioactive materials license;

2.19 **4731.4612 TRAINING FOR INDIVIDUALS FUNCTIONING AS A NUCLEAR**  
2.20 **MEDICINE TECHNOLOGIST BEFORE JANUARY 1, 2011, WHO ARE NOT**  
2.21 **ACCREDITED.**

2.22 Subpart 1. **Training program.** Individuals working as a nuclear medicine  
2.23 technologist before January 1, 2011, who are not accredited must complete a training  
2.24 program designed to demonstrate competency in the following areas:

2.25 F. administration of radiopharmaceuticals ~~as determined~~ during supervised  
2.26 clinical experience.



3.1 Subp. 4. **Continuing education.** Individuals working as nuclear medicine  
3.2 technologists before January 1, 2011, who are not accredited must:

3.3 B. have the continuing education training approved by any of the organizations  
3.4 listed in part 4731.4600, subpart 3 ~~2~~; and

3.5 C. retain documentation of continuing education for five years and make it  
3.6 available for inspection upon request by the department.

3.7 **4731.4615 DOCUMENTATION OF COMPETENCY.**

3.8 Subpart 1. **Nuclear medicine technologist; January 1, 2011.** An individual  
3.9 functioning as a nuclear medicine technologist prior to January 1, 2011, and who is not  
3.10 accredited must obtain documentation that the individual is competent to ~~applying~~ apply  
3.11 ionizing radiation to human beings.

3.12 Subp. 4. **Record retention.** The documentation of competency must be retained by  
3.13 the individual for inspection upon request by the department.