

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:

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, 4731.4436₂ 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 4731.4436₂, 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, 4731.4436₂, 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, 4731.4436₂, 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~~;

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 4731.4443₂, 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.