CHAPTER 28

BUREAU OF RADIATION PROTECTION

Authority

N.J.S.A. 26:2D–1 et seq., specifically 26:2D–7, 26:2D–9 and 26:2D–21.

Source and Effective Date

R.1995 d.457, effective July 28, 1995.
See: 26 N.J.R. 4942(a), 27 N.J.R. 3157(b).

Executive Order No. 66(1978) Expiration Date

Chapter 28, Bureau of Radiation Protection, expires on July 28, 2000.

Chapter Historical Note

Chapter 28, Bureau of Radiation Protection, was filed and became effective prior to September 1, 1969.

1969 Revisions: On September 8, 1969 the Department of Conservation and Economic Development filed the text of Subchapter 1, originally codified at N.J.A.C. 7:41–1, General Provisions, were later recodified at N.J.A.C. 7:28–1. Subchapter 2 Use of Sources of Radiation and Special Exemptions originally codified at N.J.A.C. 7:41–3, were later recodified at N.J.A.C. 7:28–2.

1972 Revisions: Amendments became effective April 20, 1972 as R.1972 d.77. See: 4 N.J.R. 100(a). Subchapter 19, formerly entitled Excessive Exposure to Ionizing Radiation became effective July 17, 1972 as R.1972 d.102. See: 4 N.J.R. 4(c).

1978 Revisions: Subchapter 25 Radiation Laboratory Fee Schedule became effective February 8, 1978 as R.1978 d.47. See: 9 N.J.R. 560(a), 10 N.J.R. 101(b). Subchapter 24 became effective March 20, 1978 as R.1978 d.101. See: 9 N.J.R. 213(b), 10 N.J.R. 146(c).

1979 Revisions: Subchapter 21 was originally adopted and became effective on May 1, 1979 as R.1979 d.64. See: 10 N.J.R. 321(a), N.J.R. 123(a).

1980 Revisions: Amendments to Subchapter 12 became effective May 1, 1980 as R.1980 d.191. See: 11 N.J.R. 227(a), 12 N.J.R. 314(b).

1981 Revisions: Subchapter 41, Mercury Vapor Lamps became effective December 7, 1981 as R.1981 d.464. See: 13 N.J.R. 9(b), 13 N.J.R. 887(c).

1982 Revisions: Amendments to Subchapter 24 became effective December 20, 1982 (operative February 18, 1983) as R.1982 d.457. See: 14 N.J.R. 507(a), 14 N.J.R. 1455(a). The amendments clarified the State Licensure Process Certification, limited to recognition by nongovernmental agencies.

1983 Revisions: December 19, 1983, R.1983 d.592 repealed and replaced the original rules of Subchapters 1 and 2 with the current text. See: 15 N.J.R. 2160(a).

1984 Revisions: Subchapter 42 became effective August 6, 1984 and amendments in the chapter became effective as R.1984 d.337. See: 16 N.J.R. 7(a), 16 N.J.R. 2120(a). Subchapter 19 was readopted with amendments and Subchapter 21 was adopted without change effective August 20, 1984 as R.1984 d.349. See: 16 N.J.R. 797(a), 16 N.J.R. 2271(a). The Subchapter 19 was substantially amended to reflect current nationally accepted criteria for radiologic technology and to expand qualifying requirements for licensure as a radiologic technologist. In addition, a hearing procedure was adopted to review charges of license violations.

1985 Revisions: Subchapter 24 expired February 14, 1985 and was readopted pursuant to Executive Order No. 66(1978) effective March 18, 1985 as R.1985d.140. See: 17 N.J.R. 22(a), 17 N.J.R. 699(a). Subchapter 12 was readopted pursuant to Executive Order No. 66(1978) effective August 5, 1985 as R.1985 d.387. See: 17 N.J.R. 1369, 17 N.J.R. 1884(a). Amendments became effective October 7, 1985 as R.1985 d.502. See: 17 N.J.R. 1626(a), 17 N.J.R. 2389(a).

1987 Revisions: Amendments became effective March 16, 1987 as R.1987 d.139. See: 18 N.J.R. 2361(a), 19 N.J.R. 449(b). Subchapter 14 was repealed and new rules became effective July 6, 1987 as R.1987 d.258. See: 18 N.J.R. 1157(a), 19 N.J.R. 1169(a). Subchapter 3, Registration; Radiation Protection Fee Schedule was repealed and new rules adopted effective November 16, 1987 as R.1987 d.485. See: 19 N.J.R. 836(a), 19 N.J.R. 2167(a). Subchapter 4 Licensing, was repealed and new rules adopted effective November 16, 1987 as R.1987 d.483. See: 19 N.J.R. 1041(a), 19 N.J.R. 2171(a). Subchapter 5 was repealed and new rules adopted effective November 16, 1987 as R.1987 d.484. See: 19 N.J.R. 839(a), 19 N.J.R. 2180(a).

Pursuant to Executive Order No. 66(1978), Chapter 28 was readopted as R.1990 d.427, effective July 30, 1990. See: 22 N.J.R. 890(a), 22 N.J.R. 2570(a). Chapter 28 was readopted as R.1995 d.457, effective July 28, 1995. Subchapter 12 was repealed by R.1995 d.457, effective August 21, 1995. See: 26 N.J.R. 4942(a), 27 N.J.R. 3157(b). See: Source and Effective Date.

See section annotations for specific rulemaking activity.

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SUBCHAPTER 1. GENERAL PROVISIONS

7:28–1.1 Purpose and scope

(a) The purpose of this chapter is to prohibit and prevent the use or presence of unnecessary radiation in such manner as to be, or tend to be, injurious or dangerous to the health of the people or the industrial or agriculture potentials of the State, or to the ecology of the State and its wildlife.

(b) Unless otherwise provided by statute or codes, rules or regulations promulgated by the Commission on Radiation Protection, this chapter shall constitute the rules of the Bureau of Radiation Protection, Department of Environmental Protection, and shall govern all persons installing, using, handling, transporting or storing sources of radiation.

7:28–1.2 Construction

These rules shall be liberally construed to permit the Department, the Bureau of Radiation Protection and its various agencies to discharge their statutory functions.

7:28–1.3 Practice where rules do not govern

The Commission may rescind, amend or expand these rules from time to time, in accordance with N.J.S.A. 26:2D–7, Chapter 116, Public Laws of 1958, as amended.

7:28–1.4 Definitions

The following words and terms, when used in this chapter shall have the following meanings unless the context clearly indicates otherwise. Additional words and terms, applicable to a specific subchapter only, will be found in that subchapter.

(a) General Terms:

"Absorbed dose" means the energy imparted to matter by ionizing radiation per unit mass of irradiated material at the place of interest. The special unit for absorbed dose is the rad. (See "Rad" under (b) below.)

"Act" means the New Jersey Radiation Protection Act, Chapter 116, Public Laws of New Jersey 1958, as amended, cited as N.J.S.A. 26:2D–1 et seq.

"Agreement state" means any state with which the United States Nuclear Regulatory Commission has entered into an effective agreement under subsection 274b of the Atomic Energy Act of 1954, as amended.

"Radio frequency protection guide (RFPG)" means the mean squared electric field strength, the mean squared magnetic field strength, and the equivalent plane wave power density which shall not be exceeded. The RFPG is an upper limit of exposure. Exposure to levels slightly in excess of the RFPG is not harmful, however, such exposure is not desirable. In all cases the exposure shall be reduced to values that are as low as reasonably achievable.

"Specific absorption rate (SAR)" means the time derivative of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ).

$$SAR = \frac{ddW}{dt\,dm} \qquad \frac{ddW}{dt\rho dV}$$

The specific absorption rate is expressed in units of watts per kilogram (W/kg). In view of the proliferation of terms for describing the electromagnetic radiation conditions in biological materials and the discipline oriented interpretation of these terms, it is recommended that the name "specific absorption rate" be used for the quantity defined here, rather than such a name as "absorbed power density per unit mass".

Amended by R.1984 d.337, effective August 6, 1984.
See: 16 N.J.R. 7(a), 16 N.J.R. 2120(a).
"Fixed radio frequency device" added.
Amended by R.1985 d.502, effective October 7, 1985.
See: 17 N.J.R. 1626(a), 17 N.J.R. 2389(a).
Added definitions "shielded position" and "x-ray tube" in (b).
Amended by R.1992 d.52, effective February 3, 1992.
See: 23 N.J.R. 1401(c), 24 N.J.R. 416(a).
Added definitions "registrant" and "protective barrier"; deleted old definitions for "primary and secondary barriers" and replaced with new definitions.
Administrative Correction.
See: 25 N.J.R. 5665(a).

Authority

N.J.S.A. 13:1D–1 et seq., and specifically N.J.S.A. 26:2D–1 et seq.

7:28–1.5 Communications

(a) Communications concerning this chapter, or matters relating to radiation protection, may be addressed to the New Jersey Department of Environmental Protection, Bureau of Radiation Protection, 380 Scotch Road, Trenton, New Jersey 08628.

(b) All emergency notification of incidents involving sources of radiation in this State shall be immediately reported to either one of the following agencies:

1. Bureau of Radiation Protection

   New Jersey State Department of Environmental Protection
   380 Scotch Road
   Trenton, NJ 08628
   Telephone: (609) 292–5586
   Hours: 8:00 A.M. to 4:30 P.M. daily, except Saturday, Sunday and Holidays.

2. Communications Officer

   Civil Defense/Civil Defense Bureau
   New Jersey State Police
   W. Trenton, New Jersey 08628
   Telephone: (609) 882–2000
   Hours: 24 hours, seven days.

SUBCHAPTER 2. USE OF SOURCES OF IONIZING RADIATION AND SPECIAL EXEMPTIONS

Authority

N.J.S.A. 13:1D–7, and specifically N.J.S.A. 26:2D–7.

Source and Effective Date

R.1983 d.592, effective December 19, 1983.
See: 15 N.J.R. 391(a), 15 N.J.R. 2160(a).

Historical Note

Rules concerning the Use of Sources Of Radiation and Special Exemptions were originally adopted pursuant to the authority delegated at N.J.S.A. 26:2C–1 et seq. (Air Pollution Control Act of 1954) and N.J.S.A. 26:2D–1 et seq. (Radiation Protection Act of 1958) and became effective prior to September 1, 1969. On September 8, 1969 the Department of Conservation and Economic Development filed the text of the rules with the Division of Administrative Procedure. Originally codified at N.J.A.C. 7:41–3, Use of Sources of Radiation and Special Exemptions were later recodified at N.J.A.C. 7:28–2. On December 19, 1983, R.1983 d.592 repealed and replaced the original rules with the current text. See: 15 N.J.R. 2160(a).

7:28–2.1 Authorized use of sources of ionizing radiation

(a) No person shall use, operate, receive, possess, dispose, transfer, install, transport or store sources of ionizing radiation in a manner other than prescribed in this chapter.

(b) No person shall cause, suffer, allow or permit any person to use, operate, receive, possess, dispose, transfer, install, transport or store sources of ionizing radiation in a manner other than prescribed in this chapter.

7:28–2.2 Supervision

(a) All sources of radiation, except those specifically exempted by other sections of this chapter, shall be under the supervision of at least one person who has demonstrated to the Department, or to any agency recognized by the Department, that the person's training and experience satisfies the Department requirements in the following areas of radiation protection:

1. Principles and practices of radiation protection;

2. X-ray and/or radioactivity measurements and monitoring techniques and instruments;

3. Mathematics and calculations basic to the use of radiation;

4. Biological effects of radiation; and

5. Any additional information, qualifications or experience as may be required by the Department.

(b) Any person applying to the Department for a license, registration or certificate pursuant to this chapter, shall include in his application the name of at least one person who has satisfied the requirements of (a) above.

7:28–2.3 Instruction

(a) All persons working in or frequenting the vicinity of radiation-producing machines or radioactive material shall be instructed in the operation and/or use of the sources of radiation and the function and need of any applicable safeguards for the sources of radiation, in accordance with preestablished procedures that have been documented and are on file for review and inspection.

(b) All visitors to controlled areas shall be instructed or escorted to prevent unnecessary exposure to radiation. See N.J.A.C. 7:28–7.4(a)4 (Use of personnel monitoring equipment for visitors).

7:28–2.4 Unattended radiation sources

No person shall cause, suffer, allow or permit any source of radiation to remain unattended and accessible to unauthorized use.

7:28–2.5 Protective devices, systems or mechanisms

(a) No person shall operate a radiation-producing machine or utilize radioactive material whenever shielding for the source of radiation, permits levels of radiation that exceed or have the potential to exceed the radiation limits specified in N.J.A.C. 7:28–6.2 (Radiation levels outside controlled areas).

(b) No person shall operate a radiation-producing machine or utilize radioactive material whenever any device, system or mechanism designed for the protection against radiation required by this chapter has not been installed or is operating improperly.

7:28–2.6 Intentional human irradiation

(a) Only persons licensed or otherwise permitted by law shall arrange for irradiation, application or administration of radiation to a human being or any part thereof, for the purpose of medical diagnosis or treatment.

(b) No provision in N.J.A.C. 7:28 regarding the treatment of human beings in the healing arts is intended to conflict with, supplant or supersede any requirement of the Medical Practices Act of New Jersey.

7:28–2.7 Exemptions for prevention or control of diseases

Rules contained in N.J.A.C. 7:28–6 or 7 and 7:28–13.2 (Reportable radiation incidents) shall not apply insofar as they relate to the intentional exposure of human beings to radiation for the purpose of diagnosis, treatment or investigation for the prevention or control of disease.

7:28–2.8 Special exemptions

The Department, upon application and a showing of hardship or compelling need, with the approval of the Commission, may grant an exemption from any requirement of these rules should it determine that such exemption will not result in any exposure to radiation in excess of the limits permitted by N.J.A.C. 7:28–6 (Permissible Dose Rates, Radiation Levels and Concentrations).

7:28–2.9 Prohibited use

(a) Hand-held fluoroscopic screens shall not be used.

(b) Shoe-fitting fluoroscopic devices shall not be used.

7:28–2.10 Emergency precautions

(a) All owners of radioactive materials shall make a study of potential radiation hazards which may arise from radiation incidents, theft of radioactive materials, fires, floods, windstorms and other disasters within and near the installation with regard to the protection of the following:

1. Tenants and employees;
2. Emergency workers;
3. General public; and
4. Fire fighters and police.

(b) Such studies shall be made for radioactive materials on hand and shall be made in advance of the receipt of additional radioactive materials.

(c) An emergency operational plan, prepared from these studies, shall inform all persons concerned of their duties and responsibilities. This plan shall be made available to the Department on request.

7:28–2.11 Inspections

(a) All persons shall afford the Department an opportunity to inspect any source of radiation and the operation associated with the source of radiation as well as the facilities and premises where the source of radiation is being used or stored.

(b) Upon request of the Department all persons shall make available for inspection by the Department records kept pursuant to the rules in N.J.A.C. 7:28.

7:28–4.28 Wrongful access or disclosure; penalties

(a) A person shall not disclose, seek access to, obtain or have possession of any confidential information obtained pursuant to the Act or this chapter, except as authorized by this subchapter.

(b) Every Department employee who has custody or possession of confidential information shall take appropriate measures to safeguard such information and to protect against its improper disclosure.

(c) A Department employee shall not disclose, or use for his or her private gain or advantage, any information which came into his or her possession, or to which he or she gained access, by virtue of his or her official position of employment or contractual relationship with the Department.

(d) If the Department finds that any person has violated provisions of this subchapter, it may:

1. Commence a civil action in Superior Court for a restraining order and an injunction barring that person from further disclosing confidential information.

2. Pursue any other remedy available by law.

(e) In addition to any other penalty that may be sought by the Department, violation of this subchapter by a Department employee shall constitute grounds for dismissal, suspension, fine or other adverse personnel action.

(f) Use of any of the remedies specified under this section shall not preclude the use of any other remedy.

SUBCHAPTER 5. CONTROLLED AREAS

7:28–5.1 Areas which must be controlled

(a) Except as provided in (b) below, every area in which there is any reasonable possibility of an occupant receiving an exposure dose from radiation and radioactive material more than the dose specified in N.J.A.C. 7:28–6 for radiation levels outside a controlled area shall be set apart as a controlled area by any person having possession, custody or control of any ionizing radiation-producing machine and/or radioactive material.

(b) All outgoing or incoming shipments of radioactive material shall be transported in conformance with N.J.A.C. 7:28–12 pertaining to transportation and all pertinent U.S. Department of Transportation regulations.

7:28–5.2 Limitations on controlled areas

No area within controlled areas shall be used for residential quarters although a room or rooms in residential buildings may be set apart as a controlled area.

7:28–5.3 Precautionary procedures

(a) Any person having possession, custody or control of any ionizing radiation-producing machine and/or radioactive material shall comply with the following precautionary procedures:

1. Area surveys shall be performed in controlled areas and in adjacent areas to insure that exposure levels to individuals conform to N.J.A.C. 7:28–6. The surveys shall be performed in accordance with N.J.A.C. 7:28–7 pertaining to Radiation survey and personnel monitoring.

2. Wipe tests shall be performed in areas where unsealed sources are routinely used to insure compliance with the requirements for radioactive contamination control in N.J.A.C. 7:28–9. The wipe tests shall be performed in accordance with N.J.A.C. 7:28–7.

3. Personnel surveys shall be performed and documented to insure compliance with N.J.A.C. 7:28–9.

4. All individuals entering a controlled area shall wear personnel monitoring equipment pursuant to the requirements for the use of personnel monitoring equipment in N.J.A.C. 7:28–7.

5. Proper and adequate instruction shall be given to all personnel working in controlled areas in the use of necessary safeguards and procedures, and they shall be supplied with such safety devices as may be required.

6. Adequate instructions or an escort shall be provided to all personnel frequenting or visiting controlled areas as shall be necessary to prevent unnecessary exposure.

7. The area shall be posted in accordance with N.J.A.C. 7:28–10.

7:28–5.4 Termination of controlled areas

Before an area where radioactive materials had been stored, utilized or generated can be reclassified as an uncontrolled area, surveys shall be performed and documented to ensure compliance with N.J.A.C. 7:28–6 for radiation levels outside of controlled areas. Wipe tests shall be performed and documented in areas where unsealed sources had been used or generated.

SUBCHAPTER 6. PERMISSIBLE DOSE RATES, RADIATION LEVELS AND CONCENTRATIONS

7:28–6.1 Exposure of individuals in controlled areas

(a) Except as provided in subsection (b) of this Section, no individual in a controlled area shall receive in any period of one calendar quarter a dose in excess of the following specified limits:

1. Whole body; head and trunk; active blood-forming organs; lens of eyes; or gonads — 1¼ Rems;

2. Hands and forearms; feet and ankles — 18¾ Rems;

3. Skin of whole body — 7½ Rems.

Note: Doses received by human patients from intentional exposure to radiation for the purpose of diagnosis or therapy shall be excluded.

(b) An individual in a controlled area may receive a dose to the whole body greater than that permitted under subsection (a) of this Section, provided:

1. During any calendar quarter the dose to the whole body shall not exceed three Rems;

2. The dose to the whole body, when added to the accumulated occupational dose to the whole body, shall not exceed five (N–18) Rems where "N" equals the individual's age in years at his last birthday; and

3. The owner has determined the individual's accumulated occupational dose to the whole body on Form BRP–27, or on a clear and legible record containing all the information required in that form: and has otherwise complied with the requirements of subsection (c) of this Section. As used in this subsection "dose to the whole body" includes any dose to the whole body, gonads, active blood-forming organs, head and trunk, or lens of eye; and

4. Doses received by human patients from intentional exposure to radiation for the purpose of diagnosis or therapy shall be excluded, in the computations set forth in paragraphs 1 and 2 of this subsection.

(c) The following requirements must be satisfied by owners who propose, pursuant to subsection (b) of this Section to permit individuals in a controlled area to receive exposure to radiation in excess of the limits specified in subsection (a) of this Section:

1. Before permitting any individual in a controlled area to receive exposure to radiation in excess of the limits specified in subsection (a) of this Section each owner shall:

i. Obtain a certificate on Form BRP–27, or on a clear and legible record containing all the information required in that form, signed by the individual showing each period of time after the individual attained the age of 18 in which the individual received, or may have received, an occupational dose of radiation; and

ii. Calculate on Form BRP–27, in accordance with the instructions, or on a clear and legible record containing all the information required in that form, the previously accumulated occupational dose received by the individual and the additional dose allowed for that individual under subsection (b) of this Section.

2. In the preparation of Form BRP–27, or on a clear and legible record containing all information required in that form, the owner shall make a reasonable effort to obtain reports of the individual's previously accumulated occupational dose. In any case where an owner is unable to obtain reports of the individual's occupational dose for a previous complete calendar quarter, it shall be assumed that the individual has received the occupational dose specified in whichever of the following columns apply:

Parts of body	Assumed exposure in rems for calendar quarters prior to Jan. 1, 1961	Assumed exposure in rems for calendar quarters beginning on or after Jan. 1, 1961
Whole body, gonads, active blood-forming organs, head and trunk, lens of eye	3¾	1¼

3. If calculation of the individual's accumulated occupational dose for all periods prior to January 1, 1961, yields a result higher than the applicable accumulated dose value for the individual as of that date, as specified in subsection (b) of this Section, the excess may be disregarded. The owner shall retain and preserve records used in preparing Form BRP–27, or its equivalent, as specified in subsection (b)3 of this Section.

(d) For individuals within a controlled area, the radiation dose to tissues of the body from radioactive materials within the body shall be controlled by limiting the average rates at which such materials are taken into the body. Where the intake results from the occurrence of radioactive materials in the air, the concentration of the radioisotopes in the air, averaged over any seven consecutive days, shall not be permitted to exceed the concentrations listed in Section 6.5(a) (Average concentrations) of this Chapter, Column B, or prorated values if more than one isotope is present. The limits given in Section 6.5(a) of this Chapter, Column B, are based upon exposure to the concentrations specified for 40 hours in any period of seven consecutive days. In any such period where the number of hours of exposure is less than 40, the limits specified in the table may be increased proportionately. In any such period, where the number of hours of exposure is greater than 40, the limits specified in the table shall be decreased proportionately.

SUBCHAPTER 11. DISPOSAL OF RADIOACTIVE MATERIALS

7:28–11.1 General requirements

The disposal of radioactive materials is permitted only to the extent and under the conditions specified in Sections 11.2 through 11.7 of this Chapter.

7:28–11.2 Disposal by release into sanitary sewerage systems

(a) An owner may discharge radioactive material into a sanitary sewerage system providing:

1. It is readily soluble or dispersible in water;

2. The quantity of any radioactive material released into the system by the owner in any one day does not exceed the larger of subparagraphs (i) or (ii) of this paragraph:

i. The quantity which, if diluted by the average daily quantity of sewage released into the sewer by the owner, will result in an average concentration not greater than the limits specified in Section 6.5(a) (Average concentrations) of this Chapter, Column A, or prorated values if more than one isotope is released: or

ii. Ten times the quantity of such material specified in Section 10.9 (Labeling, posting and disposal quantities of radioactive materials) of this Chapter; and

3. The quantity of any radioactive material released in any one month, if diluted by the average monthly quantity of sewage released by the owner, will not result in an average concentration exceeding the limits specified in Section 6.5(a) (Average concentrations) of this Chapter, Column A, or prorated values if more than one isotope is released; and

4. The gross quantity of radioactive material released into the sewerage system by the owner does not exceed one curie per year.

(b) Radioactive wastes excreted by humans shall be exempt from the limitations of subsection (a) of this Section.

7:28–11.3 Disposal by discharges into the air, ground waters or surface waters

(a) An owner may dispose of radioactive material into the air outside a controlled area provided the concentration at the point where the material leaves the controlled area is not in excess of the concentration specified in Section 6.5(a) (Average concentrations) of this Chapter, Column D, or prorated values if more than one isotope is discharged. Where the material is discharged through a stack, tube pipe, or similar conduit, the determination may be made with respect to the point where the material leaves such conduit. For purposes of this subsection, concentrations may be averaged over periods not greater than one year.

(b) No owner shall dispose of radioactive material into surface waters or into ground waters without specific, prior permission in writing from the Department.

7:28–11.4 Disposal by burial in the soil

(a) No owner shall dispose of radioactive material by burial in the soil without prior approval in writing from the Department.

(b) Sites that have been used for burial of radioactive materials shall not be converted to other uses except with the written permission of the Department.

(c) The owner of any burial ground shall notify the Department in writing not less than 30 days in advance of any transfer of title to the property involved.

7:28–11.5 Disposal by transfer to a radioisotope disposal service

(a) An owner may dispose of radioactive materials by transfer to a radioisotope disposal service providing this service has been approved by the Department to receive such materials.

(b) An owner may dispose of radioactive materials by transfer to a person who is authorized to receive such material under a license issued by the Department, a Federal agency, or any agreement state.

7:28–11.6 Disposal by incineration

No owner shall incinerate radioactive materials for the purpose of disposal or preparation for disposal except as specifically approved by the Department in writing.

7:28–11.7 Disposal by a specially approved method

(a) Any person may apply to the Department for approval of proposed procedure to dispose of radioactive material in a manner not otherwise authorized in this Subchapter.

(b) Each application shall include a description of the radioactive material, including the quantities and kinds of radioactive material and the levels of radioactivity involved, and the proposed manner and conditions of disposal.

(c) The application, where appropriate, shall also include an analysis and evaluation of pertinent information as to the nature of the environment, including topographical, geological, meteorological, and hydrological characteristics; usage of ground and surface waters in the general area; the nature and location of other potentially affected facilities; and procedures to be observed to minimize the risk of unexpected or hazardous exposures.

7:28–11.8 Unauthorized removal

Sources of radiation shall be secured against unauthorized removal from the place of storage.

SUBCHAPTER 12. (RESERVED)

SUBCHAPTER 13. REPORTS OF THEFTS AND RADIATION INCIDENTS

7:28–13.1 Reports of theft or loss of radioactive materials

The owner from whose possession a theft or loss occurs shall immediately notify the Department by telephone and telegraph of any theft or loss of radioactive material in such quantities and under such circumstances that a substantial radiation hazard and/or contamination hazard may result.

7:28–13.2 Reportable radiation incidents

(a) The owner shall immediately notify the Department by telephone and telegraph of any radiation incident which may have caused or threatens to cause the following:

1. Exposure of the whole body of any individual to 25 rems or more of radiation; exposure of the skin of the whole body of any individual to 150 rems or more of radiation; or exposure of the feet, ankles, hands or forearms of any individual to 375 rems or more of radiation;

2. The release of radioactive material in concentrations which, if averaged over a period of 24 hours, would exceed 5,000 times the limits specified for such materials in Section 6.5(a) (Average concentrations) of this Chapter Columns C and D, or prorated values if more than one isotope is released;

3. A loss of one working week or more of the operation of any facilities affected; or

4. Damage to property in excess of $100,000.

(b) The names of any individuals who have been exposed to radiation levels set forth in subsection (a) of this Section shall not be included in the report.

(c) The owner shall notify the Department within 24 hours by telephone and telegraph of any radiation incident which may have caused or threatens to cause the following:

1. Exposure of the whole body of any individual to five rems or more of radiation; exposure of the skin of the whole body of any individual to 30 rems or more of radiation; or exposure of the feet, ankles, hands or forearms to 75 rems or more of radiation;

2. The release of radioactive material in concentrations which, if averaged over a period of 24 hours, would exceed 500 times the limit specified for such materials in Section 6.5(a) (Average concentrations) of this Chapter Columns C and D, or prorated values if more than one isotope is released;

3. A loss of one day or more of the operation of any facilities affected; or

4. Damage to property in excess of $1,000.

(d) The names of any individuals who have been exposed to radiation levels set forth in subsection (c) of this Section shall not be included in the report.

(e) The owner shall notify the Department in writing within 30 days of the following:

1. Each exposure of an individual to radiation or concentrations of radioactive material in excess of any applicable limit of Subchapter 6 (Permissible Dose Rated, Radiation Levels and Concentrations) of this Chapter, or of a licensee's license;

2. Any incident for which notification is required by subsections (a) and (c) of this Section; or

3. Levels of radiation or concentrations of radioactivity, not involving exposure of any individual in excess of any applicable limit Subchapter 6 (Permissible Dose Rated, Radiation Levels and Concentrations) of this Chapter, outside a controlled area in excess of ten times the limits of Section 6.2 (Radiation levels outside controlled areas) and Subchapter 11 (Disposal of Radioactive Materials) of this Chapter, or of a licensee's license.

(f) The reports set forth in subsection (e) of this Section shall describe the extent of exposure of individuals to radiation or to radioactive materials, the levels of radiation and concentrations of radioactive materials involved, the cause of the exposure, levels, or concentrations and corrective steps taken or planned to assure against a recurrence.

(g) In each case where subsection (e)1 of this Section requires a report to the Department of exposure of an individual, the owner shall:

1. Delete from the report all references to the names and addresses of individuals so exposed. The identity of such individuals shall be privileged and shall be submitted as a separate document of such report; and

2. Concurrently given written notification to the individual of the nature and extent of the exposure. Such notice shall contain the following statement: "This report is furnished to you under the provisions of Subchapter 13 (Reports of Thefts and Radiation Incidents) of the New Jersey Administrative Code. You should preserve this report for future reference."

SUBCHAPTER 14. THERAPEUTIC INSTALLATIONS

Authority

N.J.S.A. 13:1D–1 et seq. and 26:2D–1 et seq.

Source and Effective Date

R.1987 d.258, effective July 6, 1987.
See: 18 N.J.R. 1157(a), 19 N.J.R. 1196(c).

Historical Note

All provisions of this subchapter became effective prior to September 1, 1969. The subchapter was repealed and new rules became effective July 6, 1987 as R.1987 d.258. See: 18 N.J.R. 1157(a), 19 N.J.R. 1196(c).

7:28–14.1 Scope

(a) This subchapter covers therapeutic installations used in the healing arts. These therapeutic installations include x-ray, accelerator and teletherapy installations. No registrant shall operate or permit the operation of therapeutic equipment used in the healing arts unless the equipment and installation meet the applicable requirements of this subchapter.

7:28–14.2 Definitions

The following words and terms, when used in this subchapter shall have the following meanings, unless the context clearly indicates otherwise.

"Applicator" means a structure which determines the extent of the treatment field at a given distance from the virtual source and which may or may not incorporate the beam limiting device.

"Beam interceptor" means a device located on the central axis of the primary beam whose purpose is to substantially attenuate the beam so that the room shielding requirements may be reduced.

"Beam limiting device" means a device which provides a means to restrict the dimensions of the radiation field and which is an integral part of the equipment.

"Beam monitoring system" means a system designed to detect and measure the radiation present in the useful beam.

"Beam scattering filter" means a filter used to scatter a beam of electrons.

"Central axis of the beam" means a line passing through the virtual source and the center of the plane figure formed by the edge of the final beam limiting device.

"Contact therapy system" means an x-ray system used for therapy not capable of operating above 60 kVp and with a source distance less than or equal to five centimeters.

"Department" means the New Jersey Department of Environmental Protection.

"Dose monitoring system" means a system of devices for the detection, measurement, and display of dose information for the useful beam.

"Dose monitor unit" means a unit response from the dose monitoring system from which the absorbed dose can be calculated.

"Field flattening filter" means a filter used to provide dose uniformity over the area of a useful beam of x-rays at a specified depth.

"Field size" means the projection on a plane perpendicular to the beam axis, of the distal end of the collimator as seen from the front center of the source.

"Full beam detector" means a radiation detector of such size that the total cross section of the maximum-size useful beam is intercepted.

"Gantry" means that part of the system supporting and allowing possible movements of the radiation head.

"Interlock" means a device arranged or connected such that the occurrence of an event or condition is required before a second event or condition can occur or continue to occur.

"Interruption of irradiation" means the stopping of irradiation with the possibility of continuing irradiation without resetting of operating conditions at the control panel.

"Isocenter" means a fixed point in space located at the center of the smallest sphere through which the central axis of the beam pass.

"Leakage radiation" means radiation emanating from the diagnostic or therapeutic source assembly except for the useful beam.

"Moving beam therapy" means radiation therapy with relative movement of the useful beam and the patient during irradiation.

"Normal treatment distance" means:

1. For electron irradiation, the nominal source to surface distance along the central axis of the useful beam, specified by the manufacturer for the applicator;

2. For x-ray irradiation, the nominal source to isocenter distance along the central axis of the useful beam; and

3. For non-isocentric equipment, this distance shall be specified by the manufacturer.

"Phantom" means a volume of material behaving in a manner similar to tissue with respect to the attenuation and scattering of radiation.

"Primary dose monitoring system" means a system which will monitor the quantity of radiation produced during irradiation and which will terminate irradiation when a preselected number of dose monitor units have been delivered.

"Qualified radiological physicist" means a person who holds at least a bachelor's degree in one of the physical sciences and who is certified by the American Board of Radiology either in radiological physics, x- and gamma ray physics or therapeutic radiological physics, is eligible for such certification, or has equivalent training and experience.

1. "Equivalent training and experience" means a person has:

i. A bachelor's degree in physical sciences and three years full time experience working under the direction of a physicist certified by the American Board of Radiology;

ii. A doctorate or master's degree in physical science and two years such experience; or

iii. A doctorate or master's degree in radiological or medical physics and two years of full-time, post-doctoral training with clinical experience.

"Registrant" means the person required to register with the Department pursuant to N.J.A.C. 7:28–3.

"Secondary dose monitoring system" means a system which will terminate irradiation in the event of failure of the primary system.

"Spot check" means an abbreviated calibration procedure which is performed to assure that a previous calibration continues to be valid.

"Stationary beam therapy" means radiation therapy without relative movement of the useful beam and the patient during irradiation.

"Target" means that part of a radiation-producing device used to intercept a beam of accelerated particles and cause emission of other radiation.

"Termination of irradiation" means the stopping of irradiation in a fashion which will not permit continuance of irradiation without the resetting of operating conditions at the control panel.

"Transmission detector" means a radiation detector through which the useful beam or part of the useful beam passes.

"Traceable to national standards" means a dosimetry system calibrated by the National Bureau of Standards (NBS) or calibrated in a beam which has been standardized by a transfer-grade ionization chamber having a NBS calibration.

"Treatment field" means the area of the patient's skin which is to be irradiated.

"Virtual source" means a point from which radiation appears to originate.

"Wedge filter" means an added filter effecting continuous progressive attenuation on all or part of the useful beam.

7:28–14.3 Therapeutic x-ray systems with energies less than one MeV

(a) Equipment requirements for therapeutic x-ray systems with energies less than one MeV are as follows:

1. Leakage radiation shall be measured under conditions which provide maximum leakage radiation, the leakage radiation shall not exceed the value specified at the distance specified for the classification of that x-ray system. Compliance shall be determined by measurements averaged over an area of 100 square centimeters. Measurement shall be performed at installation and whenever the tube is changed. Measurement shall be performed at least once every five years;

i. For Contact Therapy Systems, leakage radiation shall not exceed 100 milliroentgens in one hour at five centimeters from the surface of the tube housing assembly;

ii. For 0–150 kVp Systems which are installed prior to October 1, 1987, leakage radiation shall not exceed one roentgen in one hour at one meter from the target;

iii. For 0–150 kVp Systems which are installed on or after October 1, 1987, leakage radiation shall not exceed 100 milliroentgens in one hour at one meter from the target;

iv. For 151 to 500 kVp Systems the leakage radiation shall not exceed one roentgen in one hour at one meter from the target;

v. For 501 to 999 kVp Systems the leakage radiation at a distance of one meter from the target shall not exceed 0.1 percent of the useful beam exposure rate at one meter from the target; and

vi. Records of leakage radiation shall be maintained at the facility for at least five years and shall be made available for inspection by the Department.

2. Beam limiting devices for equipment installed on or after October 1, 1987 shall transmit no more than one percent of the useful beam, for the portion of the beam which is to be attenuated by the beam limiting device, when the equipment is operating at maximum kVp and with maximum filtration. Measurements shall be made at a distance of one meter from the beam limiting device and in a plane perpendicular to the central axis of the beam. For equipment installed before October 1, 1987, transmissions shall not exceed five percent of the useful beam;

3. The filter system shall be so designed that:

i. It will minimize the possibility of error in filter selection;

(p) Equipment installed on or after October 1, 1987, shall be provided with a system from whose readings the absorbed dose rate at a reference point in the treatment volume can be calculated. The radiation detectors specified in (f) above may form part of this system. In addition, the quotient of the number of dose monitor units by time shall be displayed at the treatment control panel.

(q) The registrant shall determine, or obtain from the manufacturer, the location of the following with reference to an accessible point on the radiation head and under all possible orientations of the useful beam:

1. The x-ray target or the virtual source of x-rays; and

2. The electron window, the scattering foil, or the virtual source of electrons.

(r) When pre-selection of any of the operating conditions requires action in the treatment room and at the treatment control panel, selection at one location shall not give a display at the other location until the requisite selected operations in both locations have been completed.

(s) Shadow trays shall be designed to minimize patient entrance skin dose consistent with achieving their primary purpose of safely supporting beam-modifying accessories while transmitting the light field.

(t) The following are the facility and shielding requirements for therapeutic x-ray and therapeutic accelerator installations with energies of one MeV and above:

1. The systems shall have shielding adequate to meet the requirements of N.J.A.C. 7:28–5 and 6;

2. Except for entrance doors or beam interceptors, all the required barriers shall be fixed barriers;

3. The treatment control panel shall be located outside the treatment room;

4. Windows, mirrors, closed-circuit television, or other equivalent viewing systems shall be provided to permit continuous observation of the patient during irradiation and shall be so located that the operator may observe the patient from the treatment control panel. When the primary viewing system is by electronic means (for example, television), a secondary viewing system shall be provided for use in the event of failure of the primary system;

5. Provision shall be made for two-way aural communication between the patient and the operator at the treatment control panel;

6. Treatment room entrances shall be provided with warning lights in readily observable positions near the outside of all access doors which will indicate when the useful beam is "on";

7. Interlocks shall be provided such that all entrance doors shall be closed before treatment can be initiated or continued. If the radiation beam is interrupted by any door opening, it shall only be possible to restore the machine to operation by closing the door and reinitiating exposure by manual action at the control panel; and

8. At least one "Panic" emergency shut-off button shall be located in the treatment room and one by the control panel. The "Panic" button shall be clearly visible, easily accessible and be capable of immediately terminating machine operation.

(u) The following are the calibration requirements for therapeutic x-ray and therapeutic accelerator installations with energies of one MeV and above:

1. The calibration of systems shall be performed before the system is first used for irradiation of a patient, and thereafter at time intervals which do not exceed 12 months and after any change which might, in the opinion of the qualified radiological physicist, significantly alter the calibration, spatial distribution, or other characteristics of the therapy beam;

2. The calibration shall be performed with an established calibration protocol which meets or exceeds the requirements set by the American Association of Physicists in Medicine;

3. The calibration shall be performed by a qualified radiological physicist;

4. The calibration shall be performed with a dosimetry system whose calibration shall be directly traceable to a national standard and which shall have been calibrated within the preceding three years;

5. The calibration shall be such that the dose at a reference point in soft tissue may be calculated within plus or minus 5 percent;

6. The full calibration of the therapy beam shall include, but not be limited to, the following determinations:

i. Verification that the equipment is operating in compliance with the design specifications for accuracy of the light localizer, the side light and backpointer alignment with the isocenter;

ii. Verification that the equipment is operating in compliance with the design specifications for acceptable variation in the axis of rotation for the table, gantry and jaw system, and beam flatness and symmetry at specified depths;

iii. The absorbed dose rate at representative depths in a phantom for the range of field sizes used for each effective energy, and for representative distances used for radiation therapy;

iv. The congruence between the radiation field and the field indicated by the localizing device;

v. The uniformity of the radiation field and its dependency upon the direction of the useful beam;

vi. Verification of depth-dose data and isodose curves applicable to the specific machine; and

vii. Verification of the applicability and transmission factors of all accessories such as wedges, shadow trays, compensators, etc.

7. Records of the calibration performed pursuant to 1 above shall be maintained by the registrant and made available for inspection by the Department for five years after completion of the calibration; and

8. A copy of the latest full calibration shall be available for calculating patient treatment parameters.

(v) Spot checks meeting the following requirements shall be performed on all therapeutic x-ray and therapeutic accelerator installations with energies of one MeV and above:

1. The qualified radiological physicist will determine those parameters to be spot-checked and the procedure to be used when performing those spot checks. The spot-check procedure shall be in writing and shall specify the frequency at which tests or measurements are to be performed, not to exceed one month, and the acceptable tolerance for each parameter measured in the spot-check. A qualified radiological physicist need not actually perform the spot-check measurement. If a qualified radiological physicist does not perform the spot-check measurement, the results of the spot-check measurement shall be reviewed by a qualified radiological physicist within 15 days;

2. The measurements taken during spot-checks shall demonstrate the degree of consistency of the operating characteristics which can affect the radiation output of the system or the radiation delivered to a patient during a therapy procedure;

3. The cause for a parameter exceeding tolerances set by the qualified radiological physicist shall be promptly investigated and corrected before the system is used for patient irradiation;

4. Whenever a spot-check indicates a significant change in the operating characteristics of a system, as specified in the spot-check procedures, the system shall be recalibrated as required in (u) above; and

5. Records of spot-check measurements performed shall be maintained by the registrant for a period of five years and made available for inspection by the Department.

(w) Operating procedures for therapeutic x-ray and therapeutic accelerator installations with energies of one MeV and above are as follows:

1. Therapeutic systems shall not be left unattended unless the system is secured against unauthorized use;

2. No individual other than the patient shall be in the treatment room during treatment of a patient;

3. If a patient must be held in position during treatment, mechanical supporting or restraining devices shall be used; and

4. The system shall not be used in the administration of radiation therapy unless the requirements of (u) and (v) above have been met.

Administrative correction to (b)2.
See: 24 N.J.R. 1494(a).

SUBCHAPTER 15. MEDICAL DIAGNOSTIC X-RAY INSTALLATIONS

Source and Effective Date

R.1993 d.510, effective October 18, 1993.
See: 25 N.J.R. 7(a), 25 N.J.R. 1039(a), 25 N.J.R. 4770(a), 25 N.J.R. 5148(a).

Historical Note

Prior rules concerning Medical Diagnostic X-Ray Installations were repealed by R.1993 d.510. See: Source and Effective Date.

7:28–15.1 Scope

(a) This subchapter establishes the requirements for medical radiographic and fluoroscopic installations of certified and uncertified ionizing-radiation-producing machines used in all the healing arts, except where exempted by the rules in N.J.A.C. 7:28–16, Dental Radiographic Installations.

(b) No person shall operate or permit the operation of x-ray equipment used in the healing arts unless the equipment and installation meet the applicable requirements of this subchapter.

(c) Provisions of this subchapter are in addition to and not in substitution for the applicable provisions of N.J.A.C. 7:28.

(d) The registrant shall ensure that all ionizing-radiation-producing machines under his or her jurisdiction are operated only by persons authorized pursuant to the Radiologic Technologist Act, N.J.S.A. 26:2D–24 through 36, and applicable provisions of N.J.A.C. 7:28–19.

7:28–15.2 Definitions

The words and terms listed below, when used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise.

"Accessible surface" means the external surface of the enclosure or housing provided by the manufacturer.

"Acquired date" means the date the unit has been installed and is capable of use on patients.

i. The name of the registrant of the installation as listed on form VRH–001, address, telephone number, and room location of the unit;

ii. The New Jersey Registration Number, if available;

iii. The manufacturer, model number, generator serial number, control panel serial number, tube manufacturer, tube serial number, and tube housing number;

iv. The name and address of the qualified individual performing the survey;

v. The date of survey;

vi. The survey instrument manufacturer, model number, and date calibrated;

vii. A diagram or floor plan of the area indicating the x-ray tube location, exposure switch location, normal operator position, lead shielding if present, wall, floor, and ceiling construction, labeling all areas adjacent to the exposure room including those above and below, and labeling of all areas as to occupancy and use;

viii. Records of the measurement of radiation exposure with a suitable phantom in the average patient position. Measurements shall be taken at the operator's position and at all nearby locations which are normally occupied. For each measurement, the kVp, and mA, exposure time, instrument reading, and correction made to the instrument reading (such as energy response, calibration, etc.) shall be recorded; and

ix. Exposure rates at each measured location shall be converted into Coulombs/kilogram/week or mR/week. Records shall include all assumptions of workload, use and occupancy factors used in the calculations.

7:28–15.11 Prohibited installations

(a) No person shall operate, permit to be operated, maintain or display in working condition any of the following:

1. Shoe-fitting fluoroscopic devices;

2. Chest photofluorographic machine after October 18, 1994;

3. Fixed vertical systems designed for non-image intensified fluoroscopy used for radiography after October 18, 1994;

4. Uncertified fluoroscopic equipment that does not have image intensification after October 18, 1994; or

5. Hand-held fluoroscopic screens.

7:28–15.12 Severability

If any provision of this subchapter or the application thereof to any person or circumstance is held invalid, such invalidity shall not affect other provisions or applications of the subchapter, which can be given effect without the invalid provision or application, and to this end, the provisions of this subchapter are declared to be severable.

SUBCHAPTER 16. DENTAL RADIOGRAPHIC INSTALLATIONS

Subchapter Historical Note

Subchapter 16, Dental Radiographic Installations, became effective November 5, 1990 as R.1990 d.538. See: 22 N.J.R. 894(a), 22 N.J.R. 3367(a).

7:28–16.1 Scope

(a) This subchapter establishes the requirements for dental radiographic installations.

(b) No person shall operate or permit the operation of x-ray equipment used in the practice of dentistry unless the equipment and installation meet the applicable requirements of this subchapter.

(c) The provisions of this subchapter are in addition to and not in substitution for the applicable provisions of N.J.A.C. 7:28–1 through 3, 5 through 8, 13 and 19.

7:28–16.2 Definitions

The following words and terms, when used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise.

"Cephalometric device" means a device intended for the radiographic visualization and measurement of the dimensions of the human head.

"Certified components" means components of x-ray systems which are subject to the regulations promulgated under Public Law 90–602, the Radiation Control for Health and Safety Act of 1968, 21 Code of Federal Regulations, Chapter 1, Subchapter J—Radiological Health.

"Certified unit" means any x-ray system which has only certified components.

"Coefficient of variation" or "C" means the ratio of the standard deviation to the mean value of a population of observations. It is estimated using the following equation:

$$C = \frac{s}{\overline{X}} = \frac{1}{\overline{X}} \left[\sum_{i=1}^{n} \frac{(X_i - \overline{X})^2}{n-1} \right]^{1/2}$$

where: s = estimated standard deviation of population
$\overline{X}$ = mean value of observations in sample
X_i = i^{th} observation in sample
n = number of observations in sample

"Control panel" means the x-ray system component and operational controls that include the indicators for x-ray tube voltage (kVp), tube current (mA), timer setting and beam-on.

"Diagnostic type protective tube housing" means an x-ray tube housing so constructed that the leakage radiation measured at a distance of one meter (39.37 inches) from the source does not exceed 100 milliroentgens in one hour when the tube is operated at its maximum continuous rated current for the maximum continuous rated tube potential.

"Kilovolts peak" (see "peak tube potential").

"kV" means kilovolts.

"kVp" (see "peak tube potential").

"Image receptor" means any device such as, but not limited to, a fluorescent screen or radiographic film, which transforms incident x-ray photons either into a visible image or into another form which can be made into a visible image by further transformations. In those cases where a device is provided to preselect portions of the image receptor, the term "image receptor" shall mean the preselected portion of the device.

"Leakage radiation" means all radiation emanating from the diagnostic source assembly except the useful beam. Leakage radiation also means radiation produced when the exposure switch or timer is not activated.

"mA" means milliampere.

"mAs" means milliampere second.

"Multiple dental radiographic tube installation" means an installation in which one control panel may energize more than one x-ray tube.

"Peak tube potential" means the maximum value of the potential difference across the x-ray tube during an exposure.

"Primary protective barrier" (see "protective barrier").

"Protective barrier" means a barrier of radiation absorbing material used to reduce radiation exposure. The types of protective barriers are as follows:

1. "Primary protective barrier" means the material, excluding filters, intercepting the useful beam for protection purposes to reduce the radiation exposure so that it does not exceed two millirems in any one hour.

2. "Secondary protective barrier" means a barrier sufficient to attenuate the stray radiation to reduce radiation exposure so that it does not exceed two millirems in any one hour.

"Qualified individual" means an individual who meets at least one of the following criteria for diagnostic x-ray equipment:

1. Certification by one of the following agencies in the specialty listed:

i. The American Board of Radiology in Diagnostic Radiological Physics or Radiological Physics;

ii. The American Board of Health Physics in Comprehensive Health Physics;

iii. The American Board of Medical Physics in Diagnostic Imaging Physics or Medical Health Physics;

iv. Certification issued by the Fellowship in the Canadian College of Physicists in Medicine which is equivalent to 1i or iii above; or

v. Certification by other national certifying boards which may be recognized by the Commission on Radiation Protection where the person seeking recognition as a qualified individual has petitioned the CORP in writing and where the CORP has issued a written determination that the certification in question meets the criteria of a qualified individual pursuant to this subchapter;

2. A bachelor's degree from an accredited college in biology, chemistry, radiation sciences, physics, engineering, or mathematics and at least five years of professional technical experience in the field of radiological physics or in the use of medical or dental ionizing-radiation-producing equipment;

3. A master's or doctorate degree in radiological health, radiation sciences, physics, chemistry, environmental sciences, engineering or a related field and at least two years of professional technical experience in the field of radiological physics or in the use of medical or dental ionizing-radiation-producing equipment; or

4. Ten years of professional technical experience in the field of radiological physics or in a radiation protection activity. At least five years of the required health physics experience shall have been with medical or dental ionizing radiation-producing equipment.

"Radiation (ionizing)" means any electromagnetic or particulate radiation capable of producing ions, directly or indirectly, by interaction with matter.

"Scattered radiation" means radiation that, during passage through matter, has changed in direction or in energy.

"Secondary protective barrier" (see "protective barrier").

"Source-to-image distance" or "SID" means the distance from the radiation source to the center of the input surface of the image receptor.

1. An analysis of the ability of the in-facility effluent monitoring system to measure the quantities and kinds of radioactive materials discharged under normal and under accident conditions;

2. An analysis of the ability to predict the effect of such releases on environmental contamination and radiation levels; and

3. A description of the off-site environmental monitoring system, if any, with the kinds of instruments, their sensitivity, and use.

7:28–18.3 Operation

(a) The owner of an existing major nuclear facility shall submit the information required in N.J.A.C. 7:28–18.2(c) (Facility description and required monitoring program) within one month of March 1, 1969, if he has not already done the effective equivalent of this.

(b) Operation of a major nuclear facility and its monitoring program shall be consistent with all provisions of this Chapter.

7:28–18.4 Emergency plans

The owner of every major nuclear facility shall make emergency operational plans in accordance with N.J.A.C. 7:28–1.5 (Emergency precautions). These plans shall be submitted to the Department prior to the start of operation.

7:28–18.5 Radiation incidents

The owner of every major nuclear facility shall report any radiation incident in accordance with N.J.A.C. 7:28–13 (Reports of Theft and Radiation Incidents).

SUBCHAPTER 19. MEDICAL EXPOSURE TO IONIZING RADIATION BY RADIOLOGIC TECHNOLOGISTS

Authority

N.J.S.A. 13:1D–7, N.J.S.A. 26:2D–7, and specifically N.J.S.A. 26:2D–24 et seq. (Radiologic Technologist Act).

Source and Effective Date

R.1984 d.349, effective August 20, 1984.
See: 16 N.J.R. 797(a), 16 N.J.R. 2271(a).

Historical Note

This subchapter was formerly entitled "Excessive Exposure to Ionizing Radiation" and adopted pursuant to N.J.S.A. 45:25–1 et seq., effective July 17, 1972 as R.1972 d.102. See: 4 N.J.R. 4(c). The subchapter was substantially amended by R.1984 d.349 to reflect current nationally accepted criteria for radiologic technology and to expand qualifying requirements for licensure as a radiologic technologist. In addition, a hearing procedure was adopted to review charges of license violations. See: 16 N.J.R. 797(a), 16 N.J.R. 2271(a).

7:28–19.1 Purpose and responsibility

(a) The purpose of these rules and regulations is to prohibit and prevent excessive and improper exposure to ionizing radiation as set forth in P.L. 1981, c.295, Radiologic Technologist Act (N.J.S.A. 26:2D–24).

(b) Any person owning, using or handling sources of radiation directly or indirectly, shall be responsible for compliance with provisions of these rules and regulations.

7:28–19.2 Definitions

The following words and terms, when used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise.

"Board" means the Radiologic Technology Board of Examiners created pursuant to N.J.S.A. 26:2D–24 et seq.

"CAHEA" means the Committee on Allied Health Education Accreditation.

"Chest x-ray technologist (LRT(C))" means a person, other than a licensed practitioner, whose practice of radiologic technology is limited to the chest area for diagnostic purposes.

"Commission" means the New Jersey Commission on Radiation Protection.

"Commissioner" means the Commissioner of the Department of Environmental Protection.

"Dental x-ray technologist (LRT(D))" means a person other than a licensed practitioner, whose practice of radiologic technology is limited to dental radiography for diagnostic purposes.

"Department" means the New Jersey Department of Environmental Protection.

"Diagnostic x-ray technologist (LRT(R))" means a person, other than a licensed practitioner, whose application of radiation to human beings is for diagnostic purposes.

"JRC/ERT" means Joint Review Committee in Education for Radiologic Technology.

"License" means a certificate issued by the Board authorizing the licensee to operate equipment emitting ionizing radiation on human beings for diagnostic or therapeutic purposes in accordance with the provisions of this subchapter.

"Licensed practitioner" means a person licensed or otherwise authorized by law to practice medicine, dentistry, dental hygiene, podiatry, chiropody, osteopathy or chiropractic.

"Licensed Radiologic Technologist, (LRT)" means any person licensed pursuant to this subchapter.

"Orthopedic x-ray technologist, (LRT(0))" means a person, other than a licensed practitioner, whose practice of radiologic technology is limited to the spine and extremities for diagnostic purposes only.

"Podiatric x-ray technology (LRT(P))" means a person, other than a licensed practitioner, whose practice of radiologic technology is limited to the operation of x-ray machines as used by podiatrists on the lower leg and foot area for diagnostic purposes only.

"Radiation therapy technologist (LRT(T))" means a person, other than a licensed practitioner, whose application of radiation to human beings is for therapeutic purposes.

"Radiologic technologist" means any person who is licensed pursuant to this subchapter, which shall include chest x-ray technologist (LRT(C)), dental x-ray technologist (LRT(D)), diagnostic x-ray technologist (LRT(R)), radiation therapy technologist (LRT(T)), podiatric x-ray technologist (LRT(P)), orthopedic x-ray technologist (LRT(O)), and urologic x-ray technologist (LRT(U)).

"Radiologic technology" means the use of equipment emitting ionizing radiation on human beings for diagnostic or therapeutic purposes under the supervision of a licensed practitioner.

"Student" shall mean any person who is enrolled in an approved course of study under the Radiologic Technologist Act (N.J.S.A. 26:2D–24 et seq.) or this subchapter.

"Unethical conduct" shall include, but not be limited to:

1. Engaging in the use of medical equipment emitting ionizing radiation or in the performance of any aspect of radiologic technology while in an intoxicated condition or under the influence of narcotic or any drugs which impair consciousness, judgement or behavior.

2. Willful falsification of records, or illegal destruction or theft of property or records relating to the practice of radiologic technology.

3. Failure to exercise due regard for the safety of life or health of the patient.

4. Unauthorized disclosure of information relating to a patient or his records.

5. Discrimination in the practice of radiologic technology against any individual because of race, religion, creed, color or national origin.

"Urologic x-ray technologist" means a person, other than a licensed practitioner, whose practice of radiologic technology is limited to the abdomen and pelvic area for urologic diagnostic purposes only.

Amended by R.1985 d.501, effective October 7, 1985.
See: 17 N.J.R. 1632(a), 17 N.J.R. 2393(a).
Added definition "podiatric x-ray technologist (LRT(P))."
Amended by R.1987 d.139, effective March 16, 1987.
See: 18 N.J.R. 236(a), 19 N.J.R. 449(b).
Added definitions "orthopedic x-ray technologist" and "urologic x-ray technologist" and amended "radiologic technologist."

7:28–19.3 General provisions

(a) Except as hereinafter provided, no person other than a licensed practitioner or the holder of a license as provided in this subchapter shall use x-rays in such a manner as to expose human beings.

(b) The Board shall issue a license pursuant to this subchapter provided the applicant for a specific license has met all requirements as prescribed in N.J.A.C. 7:28–19.4.

(c) No person shall operate equipment emitting ionizing radiation in such a manner as to expose human beings or cause, suffer, allow or permit the use of such equipment in such a manner except as provided in this subchapter.

(d) No person shall operate equipment emitting ionizing radiation in such a manner as to expose human beings unless such person holds a valid license issued by the Board, pursuant to this subchapter, and unless such use is restricted to the scope of practice defined on the license.

(e) No person shall operate equipment emitting ionizing radiation in such a manner as to expose human beings unless the equipment complies with all relevant provisions of Chapter 28, Title 7 of the New Jersey Administrative Code (N.J.A.C. 7:28).

(f) The license of a radiologic technologist may be suspended for a fixed period or may be revoked, or the holder of such a license may be reprimanded or otherwise disciplined in accordance with the provisions and procedures filed in N.J.S.A. 26:2D–24 et seq. and N.J.S.A. 26:2D–57.

(g) The Board shall establish criteria and standards for programs of diagnostic, radiation therapy, dental, chest, podiatric, orthopedic, or urologic x-ray technology and approve these programs upon finding that the standards and criteria have been met.

(h) No person licensed to operate equipment emitting ionizing radiation shall be permitted in the primary beam, unless it is deemed essential for the specific examination by the licensed practitioner.

Amended by R.1985 d.501, effective October 7, 1985.
See: 17 N.J.R. 1632(a), 17 N.J.R. 2393(a).
Added podiatric in (g).
Amended by R.1987 d.139, effective March 16, 1987.
See: 18 N.J.R. 2361(a), 19 N.J.R. 449(b).
Added orthopedic or urologic to (g); (h) added.

7:28–19.4 Licensure procedure

(a) The Board shall admit to examination for licensing any applicant who shall pay to the Department a nonrefundable fee as specified in N.J.A.C. 7:28–19.12 and submit satisfactory evidence, verified by oath or affirmation, that the applicant:

(j) A sponsoring institution and its affiliates may be required at any time to submit or make available to the Department such information or records as the Department or its authorized officers, employees or representatives requests and shall permit an authorized officer, employee or representative of the Department to perform site inspections. Failure to so perform shall be considered a violation of this section.

(k) A sponsoring institution whose accreditation has been withdrawn shall not be eligible for reaccreditation until such time as the deficiencies have been corrected.

(*l*) Accreditation may be withdrawn if the sponsoring institution does not have any students for a period of two successive years.

(m) A list of accredited programs and the criteria and standards as established by the Board will be available from the Department.

(n) To maintain accreditation, programs will be periodically reviewed by the Board to determine compliance with the standards and criteria as established by the Board. The Board may, at its discretion enter into agreement of settlement regarding its findings.

(*o*) Any violations of the standards may affect the program's accreditation status not withstanding any other remedy available to the Department.

(p) The sponsoring institution shall prepare in satisfactory written form and make use of detailed curriculum, a course outline for each required subject, and adequate lesson plans for classroom instruction. These materials shall be on file at the sponsoring institution and shall be accessible to any authorized officer, employee or representative of the Department.

(q) The sponsoring institution shall schedule classroom sessions in advance and give students sufficient notice thereof.

Amended by R.1985 d.501, effective October 7, 1985.
See: 17 N.J.R. 1632(a), 17 N.J.R. 2393(a).
Deleted "radiography" and substituted "podiatric."
Amended by R.1987 d.139, effective March 16, 1987.
See: 18 N.J.R. 2361(a), 19 N.J.R. 449(b).
Added orthopedic and urologic.
Administrative change in (i).
See: 23 N.J.R. 3325(b).

7:28–19.10 Use of medical ionizing equipment by students

(a) Students enrolled in and attending a Board approved program of radiologic technology may utilize the equipment emitting ionizing radiation in such a manner as to expose human beings for diagnostic or therapeutic purposes under the supervision of a licensed physician or a licensed radiologic technologist.

(b) Students enrolled in and attending a Board approved diagnostic, chest, dental, podiatric, orthopedic or urologic radiologic technology program may apply radiation to a human being for necessary diagnostic purposes only at the approved clinical facilities of the sponsoring institutions.

1. The operation of the x-ray equipment by a student shall be for the purpose of clinical experience in radiologic procedures and shall occur under the direct supervision of a licensed radiologic technologist in the appropriate category or a licensed practitioner.

2. Clinical supervision of the students shall be in accordance with Board policy.

(c) Students enrolled in and attending a New Jersey State approved college or college of medicine, osteopathy, dentistry, podiatry, or chiropractic may apply radiation to a human being for diagnostic purposes under the direct supervision of a licensed practitioner.

(d) Students enrolled in and attending an approved program of radiation therapy technology may apply radiation to a human being for necessary diagnostic (simulation) and therapeutic procedures at the clinical facilities of such school and college for the purpose of clinical experience in the use of radiation therapy equipment. Clinical supervision of the students shall be in accordance with Board policy.

(e) The maximum hours of clinical and academic involvement for any student enrolled in an approved school of radiation therapy technology or diagnostic x-ray technology in New Jersey shall not exceed a total of 40 hours per week.

Amended by R.1985 d.501, effective October 7, 1985.
See: 17 N.J.R. 1632(a), 17 N.J.R. 2393(a).
Added "podiatric" in (b).
Amended by R.1987 d.139, effective March 16, 1987.
See: 18 N.J.R. 2361(a), 19 N.J.R. 449(b).
Added orthopedic and urologic.

7:28–19.11 Criteria and standards

The Board will establish criteria and standards for educational programs in each licensing category. These standards will be printed and available from the Department of Environmental Protection, Bureau of Radiation Protection, Trenton, New Jersey 08625.

7:28–19.12 Fees

(a) Any person who submits an application for a license or license renewal to the Department shall include as an integral part of said application a service fee as follows:

1.	Application Fee:	$40.00
2.	Examination Fee:	$60.00
3.	Renewal Fee:	$50.00
4.	Replacement License:	$20.00

(b) The fees accompanying the application or license renewal shall be in the form of a certified check or money order made payable to the State of New Jersey.

1. The fees submitted to the Department are not refundable.

2. The fees accompanying the initial application or renewal shall be mailed to:

State of New Jersey
Department of Environmental Protection
Bureau of Revenue
CN 402
Trenton, New Jersey 08625

New Rule, R.1987 d.139, effective March 16, 1987.
See: 18 N.J.R. 2361(a), 19 N.J.R. 449(b).
Amended by R.1990 d.511, effective October 15, 1990.
See: 22 N.J.R. 1975(a), 22 N.J.R. 3227(c).
Fees in (a) increased; fee for replacement license added.

SUBCHAPTER 20. PARTICLE ACCELERATORS FOR INDUSTRIAL AND RESEARCH USE

Source and Effective Date

R.1992 d.52, effective February 3, 1992.
See: 23 N.J.R. 1401(c), 24 N.J.R. 416(a).

7:28–20.1 Scope

(a) This subchapter establishes requirements and procedures for the registration and use of all particle accelerators, with the exception of those regulated by N.J.A.C. 7:28–14 and 15.

(b) A person shall not operate or permit the operation of a particle accelerator unless the equipment and installation meet the applicable requirements of this subchapter.

(c) In addition to the requirements of this subchapter, all registrants of particle accelerators are subject to all other applicable requirements of N.J.A.C. 7:28–1 through 11 and 13.

7:28–20.2 Definitions

The following words and terms, when used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise:

"Direct supervision" means guidance and instruction by the qualified machine operator who is physically present, is watching the operation of the particle accelerator, and is available for immediate assistance.

"Electron microscope" means a machine that accelerates electrons for the purpose of producing highly magnified images of materials and material surfaces.

"kVp" means kilovolt peak.

"Particle accelerator" means any machine that accelerates charged particles (electrons, protons, deuterons, or other charged particles, etc.) in a vacuum and discharges the resulting particulate or other radiation but which does not meet the specifications of machines currently regulated under N.J.A.C. 7:28–14 through 16; particle accelerators include, but are not limited to, machines used for research, irradiation, or other purposes; such machines include, but are not limited to, potential-drop accelerators, electron linear accelerators, cyclotrons, betatrons, microtrons, ion implant accelerators, and electron microscopes; particle accelerators do not include high voltage generators, televisions, video display terminals, cathode ray tubes or other similar devices whose primary purpose is not the production of a useful charged particle beam.

"Particle accelerator facility" means the location at which one or more particle accelerators are installed and are operated under the same administrative control.

"Particle accelerator safety officer" or "PASO" means the person who is appointed and authorized by the registrant to act on the registrant's behalf to implement and maintain the particle accelerator radiation protection program for the registrant's facility.

"Performance test" means a procedure which is performed to assure that an instrument continues to perform its intended function.

"Qualified machine operator" means a person who meets the requirements of N.J.A.C. 7:28–20.6(a).

"Radiation protection committee" means a group consisting of at least three individuals appointed by the registrant who identify radiation safety problems, initiate, recommend, or provide corrective action plans, and verify the implementation of corrective actions. One member of this committee shall be the particle accelerator safety officer and one member shall be a representative of management. The remaining members shall be appointed at the discretion of the registrant.

"Scattered radiation" means radiation that, during passage through matter, has changed in direction or in energy.

"Stray radiation" means the sum of leakage and scattered radiation.

7:28–20.3 Registration requirements

A person shall not possess, control, use or cause a particle accelerator or an electron microscope to be used unless it has been registered with the Department pursuant to N.J.A.C. 7:28–3, unless the particle accelerator or electron microscope is incapable of operating at more than five kVp and does not produce radiation greater than 0.5 millirem per hour at any readily accessible point five centimeters from its surface.

7:28–21.6 Operating procedures

(a) No person shall cause, suffer, allow or permit the possession or use of any analytical x-ray equipment unless it is operated in accordance with the following procedures:

1. All safety devices, including but not limited to, warning lights, warning indicators, and safety interlocks as required by this subchapter shall be maintained in a fully functional operating condition. These safety devices shall be tested for proper functioning as recommended by the manufacturer or once every six months and records kept of all such testing.

2. All safety devices, including but not limited to, warning lights, warning indicators, and safety interlocks originally provided at the time of the installation of the analytical x-ray equipment, but not otherwise specified by this subchapter, shall be maintained in a fully functional operating condition. An exemption may be made, subject to the approval by the Department, when the operational procedures prohibit the normal functioning of these safety devices. Records of these exemptions shall be kept.

3. In addition to and not in substitution for the applicable requirements of subchapter 7 (Radiation Surveys and Personnel Monitoring) of this chapter, all personnel operating, repairing and aligning analytical x-ray equipment shall be provided with appropriate finger or wrist personnel monitoring equipment. The reported dose equivalent shall be recorded on Form BRP–26, "Current Occupational External Radiation Exposure," or on a clear and legible form containing all the information required on BRP–26. This reported dose equivalent shall be clearly identified as resulting from exposure to analytical x-rays.

4. A radiation survey shall be made before a new installation is placed in routine operation and whenever changes are made that could adversely affect radiation protection, as required by subchapter 7 (Radiation Surveys and Personnel Monitoring). Records shall be maintained showing the results of such surveys as required by subchapter 8 (Records) of this chapter.

7:28–21.7 Analytical x-ray equipment with a high voltage supply that cannot operate at potentials above 16 kilovolts

(a) No person shall use an analytical x-ray unit with a high voltage supply that cannot operate at potentials above 16 kilovolts or cause it to be used unless the following requirements are met:

1. The analytical x-ray unit is registered with the Department pursuant to N.J.A.C. 7:28–3.1;

2. The registrant has had a qualified individual perform a radiation safety survey of the analytical x-ray unit and has had the qualified individual prepare and submit a report of the results of the survey to the registrant. The survey shall be performed when the analytical x-ray unit is first capable of producing radiation and before the analytical x-ray unit is used for any purpose other than installation, assembly, or the conducting of radiation surveys; and

3. The registrant shall submit a copy of the radiation survey report to the Department within 30 days after the date of the survey, and shall maintain the radiation survey report at the analytical x-ray facility for review by the Department during an inspection. The registrant shall retain the radiation survey report in compliance with N.J.A.C. 7:28–8.

(b) The registrant shall not use an analytical x-ray unit with a high voltage supply that cannot operate at potentials above 16 kilovolts or cause it to be used when the unit has been moved to a location different from that identified in the initial radiation survey report or after any modifications have been made in the equipment that may compromise radiation shielding integrity, unless the following conditions are met:

1. The registrant has had a qualified individual perform a radiation safety survey of the analytical x-ray unit and has had the qualified individual prepare and submit a report of the results of the survey to the registrant. The survey shall be performed when the analytical x-ray unit is first capable of producing radiation and before the analytical x-ray unit is used for any purpose other than installation, assembly, or the conducting of radiation surveys; and

2. The registrant shall submit a copy of the radiation survey report to the Department within 30 days after the date of the survey, and shall maintain the radiation survey report at the analytical x-ray facility for review by the Department during an inspection. The registrant shall retain the radiation survey report in compliance with N.J.A.C. 7:28–8.

(c) If the results of the radiation survey required by (a)2 and (b)1 above reveal that there are no radiation levels above 0.1 mR/hr when measured at all locations five centimeters from any accessible surface of the specific analytical x-ray unit, then this analytical x-ray unit is exempt from the requirements of N.J.A.C. 7:28–21.3, 21.4, 21.5 and 21.6(a)3.

New Rule, R.1990 d.427, effective August 20, 1990.
See: 22 N.J.R. 890(a), 22 N.J.R. 2570(a).

SUBCHAPTERS 22 THROUGH 23. (RESERVED)

SUBCHAPTER 24. NUCLEAR MEDICINE TECHNOLOGY

Authority

N.J.S.A. 13D–1 et seq. and 26:2D–1 et seq.

Source and Effective Date

R.1985 d.140, effective March 18, 1985.
See: 17 N.J.R. 22(a), 17 N.J.R. 699(a).

Historical Note

This subchapter was filed and became effective January 1, 1980 as R.1978 d.101. See: 9 N.J.R. 213(b), 10 N.J.R. 146(c). Amendments were filed and became effective December 20, 1982 (operative February 18, 1983) as R.1982 d.457. See: 14 N.J.R. 507(a), 14 N.J.R. 1455(a). This amendment clarified the State licensure process; "certification" limited to recognition by nongovernmental agencies. This subchapter expired February 14, 1985 and was readopted pursuant to Executive Order No. 66(1978) effective March 18, 1985 as R.1985 d.140. See: 17 N.J.R. 22(a), 17 N.J.R. 699(a).

7:28–24.1 Scope

The regulations in this subchapter establish radiation safety requirements for persons administering radiopharmaceuticals to humans for diagnostic or therapeutic purposes or performing diagnostic or therapeutic procedures requiring administration of radiopharmaceuticals or radioactive substances to humans. This subchapter shall not be construed to in any way confer authority upon nuclear medicine technologists to utilize sealed sources for purposes of radiotherapy.

7:28–24.2 Definitions

The following words and terms, when used in this subchapter, shall have the following meanings unless the context clearly indicates otherwise.

"Act" means the Radiation Protection Act P.L. 1958, Chapter 116 as amended (N.J.S.A. 26:2D–1 et seq.).

"Approved school" means a school of nuclear medicine technology approved pursuant to this subchapter included on a list published by the department.

"Certificate" means a written authorization issued by the department pursuant to this subchapter.

"Direct supervision" means, for purposes of this subchapter, physical presence by the supervising physician or certified nuclear medicine technologist, in the room where a procedure is being performed, for a sufficient period of time to prevent unnecessary radiation to the patient.

"Initial application" means the first application submitted by an individual to the State for a license to practice nuclear medicine technology subsequent to completing the requirements in N.J.A.C. 7:28–24.4 and 7:28–24.5(a).

"License" means a written authorization issued by the department pursuant to this subchapter.

"Licensee" means any person who is licensed or recognized by the department pursuant to this chapter and the act.

"Nuclear medicine technologist" means a person who performs technical procedures in the utilization of radionuclides or radiopharmaceuticals administered to humans.

"Physician" means an individual who upon having satisfied the requirements of the New Jersey State Board of Medical Examiners, has been issued a plenary license to practice medicine and surgery in this State.

"Radionuclide" means a radioactive element or a radioactive isotope.

"Radiopharmaceutical" means a radionuclide or radioactive compound designed and prepared for organ or body system administration.

NOTE: Definitions for other terms used in this subchapter may be found in subchapter 1 of this chapter.

7:28–24.3 Use of radionuclides and radiopharmaceuticals

(a) No owner or licensee shall cause, suffer, allow or permit any person to act as a nuclear medicine technologist unless such person has been issued a license as provided for by this subchapter.

(b) No person shall cause, suffer, allow or permit the use or application of radionuclides or radiopharmaceuticals or otherwise engage in the practice of nuclear medicine technology without having first satisfied the licensing requirements of this subchapter.

(c) The licensing requirements of this subchapter shall not apply to a hospital resident or intern who is specializing in nuclear medicine or to students enrolled in and attending a school or college of medicine, osteopathy or nuclear medicine technology provided such students are acting under the direct supervision of a physician or a licensed nuclear medicine technologist responsible to such physician.

(d) The licensing requirements of this subchapter shall not apply to hospital residents or interns involved in nuclear medicine procedures but not specializing therein provided that they are acting under the direct supervision of a physician or a licensed nuclear medicine technologist responsible to such physician under special circumstances.

7:28–24.4 Examination requirements

(a) In order to be eligible for admission to a licensing examination, an applicant must:

1. Have satisfactorily completed a course of study in an approved school; or

2. For a period of three years from the effective date of this subchapter become qualified in accordance with section 10 of this subchapter.

7:28–24.15 Fees

(a) Any person who submits an application for a license, relicensing or license renewal to the department shall include as an integral part of said application a service fee as follows.

1. Application Fee: $40.00;

2. Renewal Fee: $20.00.

(b) The fees accompanying the application or annual registration renewal shall be in the form of a certified check or money order made payable to the State of New Jersey.

1. The fees submitted to the department are not refundable.

2. The applications or registrations and the fees accompanying them shall be mailed to:

State of New Jersey
Department of Environmental Protection
Bureau of Collection and Licensing Unit
CN 402
Trenton, New Jersey 08625

(c) The waiving of the written examination of any applicant whom the Commission on Radiation Protection has deemed competent will not result in any reduction of the fee for the license examination.

(d) The license issued pursuant to this subchapter shall be validated on an annual term commencing with January 1 of the year for which it is issued and expiring 12:00 midnight December 31 of the same year.

7:28–24.16 Unethical conduct

(a) No nuclear medicine technologist or student shall engage in any unethical conduct. Such conduct may include, but is not limited to:

1. Engaging in the practice of nuclear medicine technology while in an intoxicated state or under the influence of narcotic or any drugs which impair consciousness, judgement or behavior.

2. Willful falsification of records, or destruction or theft of property or records relating to the practice of nuclear medicine technology;

3. Failure to exercise due regard for the safety of life or health of the patient;

4. Unauthorized disclosure of information relating to a patient or a patient's records;

5. Discrimination in the practice of nuclear medicine technology against any person on account of race, religion, color or national origin.

7:28–24.17 Guidelines

The department may, from time to time, publish guideline and/or procedural rules to explain and implement the various provisions of this subchapter.

SUBCHAPTER 25. RADIATION LABORATORY FEE SCHEDULE

Authority

N.J.S.A. 13:1B–3, 13:1D–9, 58:12A–1 et seq., and N.J.S.A. 26:2D–1 et seq., specifically N.J.S.A. 58:12A–4, 58:12A–9h and p, and N.J.S.A. 26:2D–91.

Source and Effective Date

R.1989 d.349, effective July 3, 1989.
See: 21 N.J.R. 826(a), 21 N.J.R. 1904(a).

Historical Note

Unless otherwise expressly noted, all provisions of subchapter 25, were adopted pursuant to authority of N.J.S.A. 26:20–1 et seq. and were filed and became effective on February 8, 1978, as R.1978 d.47. See: 9 N.J.R. 560(a), 10 N.J.R. 101(b). Subchapter 25 was repealed and replaced as R.1989 d.349 effective July 3, 1989. See: Source and Effective Date.

7:28–25.1 Scope

This subchapter establishes the Department's fee schedule and procedures for conducting various radioanalytical services in the analyzing of public water systems for radioactivity in accordance with the New Jersey Primary Drinking Water Regulations, N.J.A.C. 7:10–5.

Amended by R.1996 d.188, effective April 1, 1996.
See: 27 N.J.R. 4116(b), 28 N.J.R. 1847(a).

7:28–25.2 Definitions

The following words and terms, when used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise.

"Emergency priority analysis" means analysis and reporting of results within the one to 21 day turnaround times set forth at N.J.A.C. 7:28–25.4(b).

"Gross alpha particle activity" means the total radioactivity due to alpha particle emission as inferred from measurements on a dry sample.

"Gross beta particle activity" means the total radioactivity due to beta particle emission as inferred from measurements on a dry sample.

"Immediate priority analysis" means analysis and reporting of results within the three to 25 day turnaround times set forth at N.J.A.C. 7:28–25.4(b).

"Public community water system" means a public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

"Public noncommunity water system" means a public water system that is not a community water system.

"Public water system" means a system for the provision to the public of piped water for human consumption, if such system has at least 15 service connections or regularly serves at least 25 individuals daily at least 60 days out of the year. Such term includes any collection, treatment, storage and distribution facilities under control of the operator of such system and used primarily in connection with such system, and any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. A public water system is either a "community water system" or a "noncommunity water system".

"Supplier of water" means any person who owns or operates a public water system.

"Water system" means a system for providing potable water to any person.

Amended by R.1996 d.188, effective April 1, 1996.
See: 27 N.J.R. 4116(b), 28 N.J.R. 1847(a).
Added "emergency priority analysis" and "immediate priority analysis".

7:28–25.3 Terms and procedures for use of the Bureau of Radiation and Inorganic Analytical Services (BRIAS)

(a) Any supplier of water requesting radioanalytical testing by the Bureau of Radiation and Inorganic Analytical Services (BRIAS) for the purpose of analyzing a public water system for radioactivity shall apply, in writing, to the address listed below for a sample delivery schedule to be established by BRIAS:

New Jersey Department of Environmental Protection
Bureau of Radiation and Inorganic Analytical Services (BRIAS)
CN 411
380 Scotch Road
Trenton, New Jersey 08625–0411

(b) BRIAS shall not accept a water sample for radiological testing from any supplier of water unless the container complies with the requirements of the Regulations Governing Laboratory Certification and Standards of Performance set forth at N.J.A.C. 7:18. Containers may be obtained from BRIAS or may be provided by the supplier of water.

(c) Suppliers of water desiring priority analysis and reporting of water samples may request expedited services as follows:

1. Immediate priority analysis.

2. Emergency priority analysis.

3. The laboratory will charge an additional fee for such expedited analysis as provided in N.J.A.C. 7:28–25.4 (c).

Amended by R.1996 d.188, effective April 1, 1996.
See: 27 N.J.R. 4116(b), 28 N.J.R. 1847(a).

7:28–25.4 Fees for radioanalytical tests

(a) Any supplier of water for radioanalytical testing shall pay the following fees:

Category of Radiological Test	Test Fee ($)
Gross Alpha	$253.00
Gross Beta	253.00
Gross Alpha and Beta	253.00
Tritium	289.00
Radium-226	362.00
Radium-228	470.00
Iodine-131	326.00
Strontium-90	362.00
Cesium-134 and 137	217.00
Strontium-89 and 90	362.00
Uranium	723.00
Radon-222	145.00
Gamma-ray Spectroscopy	289.00

(b) The priority analysis turnaround times (in days from sample receipt by the Department) are as follows:

Test	Immediate Priority	Emergency Priority
Gross Alpha	5	2
Gross Beta	5	2
Gross Alpha & Beta	5	2
Tritium	4	2
Radium–226	25	18
Radium–228	12	8
Iodine–131	7	4
Strontium–90	25	21
Cesium–134 and 137	7	3
Strontium–89 and 90	25	21
Uranium	10	5
Radon–222	3	1
Gamma-ray Spectroscopy	5	1

(c) Any supplier of water requesting immediate or emergency priority analyses shall pay the following fees:

1. Immediate priority analysis: +50 percent of the test fee set forth in (a) above.

2. Emergency priority analysis: +100 percent of the test fee set forth in (a) above.

Amended by R.1996 d.188, effective April 1, 1996.
See: 27 N.J.R. 4116(b), 28 N.J.R. 1847(a).
Increased fees in (a) and added (c).

7:28–25.5 Payment of fees

Any supplier of water to BRIAS for radiological testing shall pay fees within 60 days of the invoice billing date issued by the Department. Payment of the fees shall accompany the invoices and shall be made payable by check or money order, to "Treasurer, State of New Jersey". Payments and invoices shall be remitted to the Bureau of Revenue at the following address:

Department of Environmental Protection
Bureau of Revenue
CN 417
428 East State Street
Trenton, New Jersey 08625–0417

Amended by R.1996 d.188, effective April 1, 1996.
See: 27 N.J.R. 4116(b), 28 N.J.R. 1847(a).

SUBCHAPTER 26. (RESERVED)

SUBCHAPTER 27. CERTIFICATION OF RADON TESTERS AND MITIGATORS

Authority

N.J.S.A. 13:1B–3, N.J.S.A. 13:1D–9, N.J.S.A. 26:2D–1 et seq., and particularly, 26:2D–70 et seq.

Source and Effective Date

R.1990 d.559, effective November 19, 1990 (operative January 13, 1991).
See: 21 N.J.R. 3369(a), 22 N.J.R. 3516(a).

7:28–27.1 Scope

This subchapter establishes rules, requirements and procedures that a person who wishes to perform radon testing or mitigation in New Jersey shall comply with in order to become and remain certified. Certification is mandatory in New Jersey pursuant to N.J.S.A. 26:2D–70 et seq. for any person who sells radon/radon progeny devices, tests for radon/radon progeny or mitigates radon in buildings. Mitigation devices that reduce only radon progeny levels will not be certified under this subchapter. Any person not certified and performing radon services shall be subject to the criminal penalties in N.J.S.A. 26:2D–77.

7:28–27.2 Definitions

The following words and terms, when used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise.

"Act" means the New Jersey Radiation Protection Act, N.J.S.A. 26:2D–1 et seq.

"Applicant" means any person who applies for certification.

"Authorized measurement protocols" means, for radon measurements in air, the "Interim Indoor Radon and Radon Decay Product Measurement Protocols", E.P.A. 520/1–86–04, amendments thereto, or its latest revision; and "Interim Protocols for Screening and Follow-up Radon and Radon Decay Product Measurements", EPA 520/1–86–014–1; page 4 and 13, and 15.

"Authorized proficiency program" means the United States Environmental Protection Agency Radon/Radon Progeny Measurement and Proficiency Program, at the Eastern Environmental Radiation Facility, Montgomery, Alabama 36109 or other program equally stringent and authorized by the Department in accordance with the latest edition of New Jersey Department of Environmental Protection document "New Jersey Radon Measurement Proficiency Program."

"Building" means a structure enclosed with exterior walls or fire walls, built, erected and framed of component structural parts, designed for the housing, shelter, enclosure or support of individuals.

"Business day" means any day of the year, exclusive of Saturdays, Sundays, and State of New Jersey holidays.

"Certified radon laboratory" means a radiological laboratory which analyzes samples for the presence of radon and/or radon decay products in a facility separate from the location in which the sample was taken using stationary detection equipment, and holds a current valid certificate issued by the Department pursuant to N.J.A.C. 7:18 for radon analysis.

"Certified person" means a certified radon measurement business, certified radon measurement specialist, certified radon measurement technician, certified radon mitigation business, certified radon mitigation specialist or certified radon mitigation technician as defined in this subchapter.

"Certified radon measurement business" means a commercial business enterprise certified pursuant to this subchapter to sell devices or test for radon and/or radon progeny.

"Certified radon measurement specialist" means a person certified pursuant to this subchapter to perform and/or evaluate radon and/or radon progeny measurements for a certified radon measurement business.

"Certified radon measurement technician" means a person certified pursuant to this subchapter to perform radon and radon progeny measurement activities.

"Certified radon mitigation business" means a commercial business outlet certified pursuant to this subchapter to

design and/or install systems in buildings to mitigate and safeguard against radon contamination.

"Certified radon mitigation specialist" means a person certified pursuant to this subchapter to evaluate diagnostic tests to determine appropriate radon mitigation and safeguard strategies for a building.

"Certified radon mitigation technician" means a person certified pursuant to this subchapter who installs and/or supervises the installation of radon mitigation or safeguard systems in buildings.

"Department" means the New Jersey Department of Environmental Protection.

"Diagnostic tests" means tests performed or procedures used to determine appropriate mitigation methods for a building.

"Effective(ness)" as it applies to mitigation means, a system, material, or procedure which when installed in a building consistently reduces radon levels to or below 4 pCi/l in the lowest lived-in level of the building.

"Mitigate" means to apply materials and/or install systems and materials to reduce radon concentrations in the indoor atmosphere or prevent entry of radon into the indoor atmosphere.

"Mitigation system" means a step or series of steps employed to actively reduce radon levels in buildings including but not limited to, sealing techniques, natural and forced air ventilation techniques and soil ventilation techniques.

"Person" means and shall include corporations, companies, associations, societies, firms, partnerships, and joint stock companies as well as individuals.

"Picocurie per liter (pCi/l)" means 2.2 disintegrations per minute of radioactive material per liter. It may be used as a measure of the concentration of radon gas in air. One picocurie is equivalent to 10^{-12} Curies.

"Proficiency test" means a test conducted within an authorized proficiency program that a radon measurement business must pass at prescribed times in order to demonstrate its ability to test for radon and/or radon progeny and to become certified and maintain certification.

"Radon" means the radioactive noble gas radon–222.

"Radon progeny" means the short-lived radionuclides formed as a result of the decay of radon–222, including polonium–218, lead–214, bismuth–214 and polonium–214.

"Reciprocal agreement state" means a state, formally recognized by the Department, which has established radon certification requirements and procedures no less stringent than those required by this subchapter and complies with the requirements of N.J.A.C. 7:28–27.23.

"Scope of employment" means acts carried out which are so closely connected with what a servant is employed to do and so fairly and reasonably incidental to it that they may be regarded as methods, even though improper, of carrying out the objectives of the employment and furthering the interest of the employer.

"USEPA" means the United States Environmental Protection Agency.

"Working level (WL)" means that concentration of short-lived radon decay products that will result in 130,000 million electron volts of potential alpha particle energy per liter of air. Working level is a measure of radon decay product concentration in air.

7:28–27.3 General provisions

(a) Beginning 90 days (May 13, 1991) after the date of establishment of this certification program, no person may sell devices, test for, mitigate, or safeguard against the presence of radon in the State of New Jersey unless such person is certified pursuant to this subchapter or has been exempted from certification pursuant to N.J.A.C. 7:28–27.31, or temporarily certified in accordance with the provisions of N.J.A.C. 7:28–27.35.

1. The date of establishment of the certification program will be 120 days (February 12, 1991) after the date of adoption of this subchapter. Program administration and activity fees assessed under this subchapter will not be collected until the program is established.

(b) A certified person shall continuously remain in compliance with the Act and this subchapter.

(c) No certification shall be issued or renewed unless the applicant demonstrates to the Department that the following requirements are met:

1. The applicant is not in violation of the Act or this subchapter and does not have a certification issued by the Department suspended or revoked; and

2. The applicant is capable of performing the activities for which he or she is seeking certification in accordance with the Act and this subchapter.

(d) Any person certified to perform radon measurement and/or mitigation shall only do such measurements and/or mitigations for which the person is certified.

7:28–41.2 Definitions

The following words and terms, when used in this subchapter, shall have the following meanings unless the context clearly indicates otherwise.

"Mercury vapor lamp" means any mercury vapor or metal halide lamp incorporating a high-pressure arc discharge tube that has a fill consisting primarily of mercury and that is contained within an outer envelope (it does not include the tungsten filament self-ballasted mercury vapor or metal halide lamp).

"New facility" means any building for which a certificate of occupancy has been issued subsequent to the effective date of this subchapter.

"Non-self-extinguishing mercury vapor lamp" means a mercury vapor lamp which does not comply with the requirements for a self-extinguishing mercury vapor lamp, hereinafter defined.

"Outer envelope" means the lamp element, usually glass, surrounding a high-pressure arc discharge tube, that, when intact, attenuates the emission of ultraviolet radiation.

"Self-extinguishing mercury vapor lamp" means a mercury vapor lamp which shall cease operation within a cumulative operating time not to exceed 15 minutes following breakage or removal of at least three square centimeters of contiguous surface of the outer envelope. Self-extinguishing lamps manufactured prior to September 7, 1981 shall cease operation within a cumulative operating time not to exceed 15 minutes following complete breakage or removal of the outer envelope.

"Shortwave ultraviolet radiation" means radiation with wave-length shorter than 320 nanometers.

7:28–41.3 General requirements for indoor installations

(a) No person shall cause, suffer, allow or permit the installation or use of a mercury vapor lamp in any indoor area which may be occupied by people unless the following requirements are met:

1. The mercury vapor lamp is of the self-extinguishing type; or

2. The mercury vapor lamp is of the non-extinguishing type provided it is installed within a totally enclosed lighting fixture with a protective shield which protects the lamp damage and absorbs shortwave ultraviolet radiation.

(b) The provisions of this section shall be fully met within one year after the effective date of this chapter.

7:28–41.4 General requirements for outdoor installations

(a) No person shall cause, suffer, allow or permit the installation or use of a mercury vapor lamp in any outdoor area where people are likely to remain in the area of illumination for periods in excess of 15 minutes unless the following requirements are met:

1. The mercury vapor lamp is of the self-extinguishing type; or

2. The mercury vapor lamp may be of the non-self-extinguishing type provided it is installed within a totally enclosed lighting fixture with protective shield which protects the lamp from damage and absorbs shortwave ultraviolet radiation.

(b) The Department may exempt certain outdoor mercury vapor lamp installations from the provisions of (a) above, provided the Department has determined that sufficient precautions have been taken to minimize the possibility of over-exposure to shortwave ultraviolet radiation.

(c) The provisions of this section shall be met within one year after the effective date of this subchapter.

SUBCHAPTER 42. RADIO FREQUENCY RADIATION

7:28–42.1 Scope

(a) This subchapter governs exposure to radio frequency radiation from fixed radio frequency devices.

(b) This subchapter shall not apply to the intentional exposure of patients to radiation for the purpose of diagnosis, treatment or investigation for the prevention or control of disease.

Amended by R.1987 d.206, effective May 4, 1987.
See: 18 N.J.R. 1166(a), 19 N.J.R. 770(a).
Deleted non-occupational from (a).

7:28–42.2 Purpose

The purpose of this subchapter is to define safety requirements for the use of radio frequency devices that radiate in the frequency range 300 kHz to 100 GHz in order to prevent possible harmful effects in human beings from exposure to such radiation.

7:28–42.3 Radio Frequency Protection Guides (RFPG)

(a) Radio frequency devices, excluding microwave ovens, shall be maintained as follows:

1. No person shall cause, suffer, allow or permit the use of a radio frequency device which exposes or may expose any worker or member of the public to radio frequency radiation which is in excess of the applicable Radio Frequency Protection Guide in N.J.A.C. 7:28–42.4.

2. At frequencies between 300 kHz and 100 GHz, the RFPG in N.J.A.C. 7:28–42.4 may be exceeded if the exposure conditions can be shown by laboratory proce-

dures to produce specific absorption rates (SARs) below 0.4 W/kg as averaged over any one gram of tissue.

(b) Microwave ovens shall be maintained as follows:

1. No person shall cause, suffer, allow or permit the use of a microwave oven manufactured after October 6, 1971 that radiates in excess of 5mW/cm^2 at any point 5 cm or greater from any external surface of the oven.

2. No person shall cause, suffer, allow or permit the use of a microwave oven manufactured before October 6, 1971 that radiates in excess of 10mW/cm^2 at any point 5 cm or greater from any external surface of the oven.

3. Measurements shall be made with the microwave oven operating at its maximum output and with a container of 275 ±15 ml of tap water at an initial temperature of 20 ±5°C placed on the carrying surface provided by the manufacturer.

i. The container shall be a low form 600 ml beaker having an inside diameter of approximately 8.5 cm and made of electrically non-conductive material such as glass or plastic.

Administrative correction to (a)1 and (b)1 and 2.
See: 24 N.J.R. 4526(a).

7:28–42.4 Radio Frequency Protection Guides (RFPG) for whole body exposure

Frequency Range	Maximum Allowed Mean Squared Electric Field Strength (V/m)^2	Maximum Allowed Mean Squared Magnetic Field Strength (A/m)^2	Equivalent Plane Wave Power Density (mW/cm^2)
300 kHz–3 MHz	400,000	2.5	100
3 MHz–30 MHz	4,000 (900/f^2)	0.025 (900/f^2)	900/f^2
30 MHz–300 MHz	4,000	0.025	1.0
300 MHz–1.5 GHz	4,000 (f/300)	0.025 (f/300)	f/300
1.5 GHz–100 GHz	20,000	0.125	5.0

Note 1. f—frequency (MHz)

Note 2. For near field exposure, both the mean squared electric and magnetic field strengths shall be determined.

Note 3. For frequencies below 300 MHz, both the mean squared electric and magnetic field strengths shall be determined.

Note 4. At frequencies above 300 MHz, either the mean squared electric or magnetic field strengths shall be determined.

Note 5. The applicable RFPG shall be averaged over any 0.1 hour interval.

Note 6. Measurement to determine adherence to the RFPG shall be made at distances 5 cm or greater from any object.

Note 7. Where electromagnetic fields are present at more than one frequency or for broadband fields, the fraction of the RFPG incurred within each frequency interval shall be determined and the sum of all such fractions shall not exceed unity.

Administrative Correction at "Frequency Range" and at "Maximum Allowed Mean Squared Magnetic Field Strength".
See: 24 N.J.R. 4371(a).

SUBCHAPTERS 43 THROUGH 47. (RESERVED)

SUBCHAPTER 48. FEES FOR THE REGISTRATION OF NONIONIZING RADIATION PRODUCING SOURCES

Source and Effective Date
R.1995 d.6, effective January 3, 1995.
See: 25 N.J.R. 5422(a), 26 N.J.R. 793(b), 27 N.J.R. 99(a).

7:28–48.1 Scope, purpose and general provisions

(a) This subchapter establishes initial registration fees and annual renewal fees for all radiofrequency and microwave heaters, sealers and industrial ovens, and imposes reporting requirements on the owners of these sources. The fees collected by the Department will support a program that will assure the compliance of the regulated sources with the applicable provisions of N.J.A.C. 7:28–42.

(b) Each owner of a nonionizing radiation producing source that is subject to this subchapter is responsible for ensuring compliance with all requirements of this subchapter. If there is more than one owner of a nonionizing radiation producing source, each owner is jointly and severally liable for complying with all the requirements of this subchapter.

(c) If an owner fails to comply with any of the Department's requests made pursuant to this subchapter, the Department may assess a penalty in accordance with N.J.S.A. 26:2D–13.

7:28–48.2 Definitions

The following words and terms, when used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise.

"Controlling interest" means the interest held by the person or persons who owns more than 50 percent of the voting stock or other equity interest in an owner; it also means the interest held by a person or persons who owns 50 percent or less of the voting stock or other equity interest in an owner and who possesses, directly or indirectly, the power to direct or cause the direction of the management and policies in an owner.