CHAPTER 28

RADIATION PROTECTION PROGRAMS

Authority

N.J.S.A. 26:2D–1 et seq., specifically 26:2D–7, 26:2D–9, 26:2D–21 and 26:2D–76.

Source and Effective Date

R.2000 d.120, effective February 25, 2000.
See: 31 N.J.R. 3007(a), 32 N.J.R. 1016(a).

Chapter Expiration Date

In accordance with N.J.S.A. 52:14B-5.1c, Chapter 28, Radiation Protection Programs, expires on August 24, 2005. See: 37 N.J.R. 8(a).

Chapter Historical Note

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

Subchapter 19, Excessive Exposure to Ionizing Radiation, was adopted as R.1972 d.102, effective July 17, 1972. See: 4 N.J.R. 4(c).

Subchapter 25, Radiation Laboratory Fee Schedule, was adopted as R.1978 d.47, effective February 8, 1978. See: 9 N.J.R. 560(a), 10 N.J.R. 101(b).

Subchapter 24, Nuclear Medicine Technology, was adopted as R.1978 d.101, effective March 20, 1978. See: 9 N.J.R. 213(b), 10 N.J.R. 146(c).

Subchapter 21, Analytical X-Ray Installations, was adopted as R.1979 d.64, effective May 1, 1979. See: 10 N.J.R. 321(a), N.J.R. 123(a).

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

Subchapter 1, General Provisions, and Subchapter 2, Use of Sources of Radiation and Special Exemptions, were repealed and Subchapter 1, General Provisions, and Subchapter 2, Use of Sources of Ionizing Radiation and Special Exemptions, were adopted as new rules by R.1983 d.592, effective December 19, 1983. See: 15 N.J.R. 391(a), 15 N.J.R. 2160(a).

Subchapter 42, Radio Frequency Radiation, was adopted as R.1984 d.337, effective August 6, 1984. See: 16 N.J.R. 7(a), 16 N.J.R. 2120(a).

Pursuant to Executive Order No. 66(1978), Subchapter 21, Analytical X-Ray Installations, was readopted as R.1984 d.353, effective August 6, 1984. See: 16 N.J.R. 1310(a), 16 N.J.R. 2276(a).

Subchapter 19, Medical Exposure to Ionizing Radiation by Radiologic Technologists, was adopted as R.1984 d.349, effective August 20, 1984. See: 16 N.J.R. 797(a), 16 N.J.R. 2271(a).

Pursuant to Executive Order No. 66(1978), Subchapter 24, Nuclear Medicine Technology, expired February 14, 1985.

Subchapter 24, Nuclear Medicine Technology, was adopted as new rules by R.1985 d.140, effective March 18, 1985. See: 17 N.J.R. 22(a), 17 N.J.R. 699(a).

Pursuant to Executive Order No. 66(1978), Subchapter 12, Transportation, was readopted as R.1985 d.387, effective August 5, 1985. See: 17 N.J.R. 1369(a), 17 N.J.R. 1884(a).

Subchapter 14, Therapeutic Installations, was repealed and Subchapter 14, Therapeutic Installations, was adopted as new rules by R.1987 d.258, effective July 6, 1987. See: 18 N.J.R. 1157(a), 19 N.J.R. 1196(c).

Subchapter 3, Registration: Radiation Protection Fee Schedule, was repealed and Subchapter 3, Registration of Ionizing Radiation-Producing Machines and Radioactive Materials, was adopted as new rules by R.1987 d.485, effective November 16, 1987. See: 19 N.J.R. 836(a), 19 N.J.R. 2167(a).

Subchapter 4, Licensing, was repealed and Subchapter 4, Licensing of Naturally Occurring and Accelerator Produced Radioactive Materials, was adopted as new rules by R.1987 d.483, effective November 16, 1987. See: 19 N.J.R. 1041(a), 19 N.J.R. 2171(a).

Subchapter 5, Controlled Areas, was repealed and Subchapter 5, Controlled Areas, was adopted as new rules by R.1987 d.484, effective November 16, 1987. See: 19 N.J.R. 839(a), 19 N.J.R. 2180(a).

Subchapter 25, Radiation Laboratory Fee Schedule, was repealed and Subchapter 25, Radiation Laboratory Fee Schedule, was adopted as new rules by R.1989 d.349, effective July 3, 1989. See: 21 N.J.R. 826(a), 21 N.J.R. 1904(a).

Pursuant to Executive Order No. 66(1978), Chapter 28, Bureau of Radiation Protection, was readopted as R.1990 d.427, effective July 30, 1990. See: 22 N.J.R. 890(a), 22 N.J.R. 2570(a).

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

Subchapter 27, Certification of Radon Testers and Mitigators, was adopted as 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).

Subchapter 20, Particle Accelerators for Industrial and Research Use, was adopted as R.1992 d.52, effective February 3, 1992. See: 23 N.J.R. 1401(c), 24 N.J.R. 416(a).

Subchapter 15, Medical Diagnostic X-Ray Installations, was repealed and Subchapter 15, Medical Diagnostic X-Ray Installations, was adopted as new rules by 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).

Subchapter 48, Fees for the Registration of Nonionizing Radiation Producing Sources, was adopted as 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).

Pursuant to Executive Order No. 66(1978), Chapter 28, Bureau of Radiation Protection, was readopted as R.1995 d.457, effective July 28, 1995, and Subchapter 12, Transportation, was repealed by R.1995 d.457, effective August 21, 1995. See: 26 N.J.R. 4942(a), 27 N.J.R. 3157(b).

Pursuant to Executive Order No. 66(1978), Chapter 28, Radiation Protection Programs, was readopted as R.2000 d.120, effective February 25, 2000, and Subchapter 25, Radiation Laboratory Fee Schedule, was repealed by R.2000 d.120, effective March 20, 2000. See: 31 N.J.R. 3007(a), 32 N.J.R. 1016(a). See, also, section annotations.

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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 Radiation Protection Programs, Department of Environmental Protection, and shall govern all persons installing, using, handling, transporting or storing sources of radiation.

Amended by R.2000 d.120, effective March 20, 2000.
See: 31 N.J.R. 3007(a), 32 N.J.R. 1016(a).
In (b), substituted a reference to the Radiation Protection Programs for a reference to the Bureau of Radiation Protection.

7:28–1.2 Construction

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

Amended by R.2000 d.120, effective March 20, 2000.
See: 31 N.J.R. 3007(a), 32 N.J.R. 1016(a).
Substituted a reference to the Radiation Protection Programs for a reference to the Bureau of Radiation Protection.

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.

"ALARA" means "as low as is reasonably achievable", taking into account the state of technology and the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to the utilization of radiation in the public interest.

"Area" means a bounded space such as a room, floor, building, plant or any designated geographical entity having physical or imaginary boundaries.

"Average dose rate" means an integrated or accumulated dose of radiation divided by the time over which the integration or accumulation took place or by a specified length of time.

"Background radiation" means radiation from cosmic sources; naturally occurring radioactive material, including radon (except as a decay product of source, special nuclear material, or technologically enhanced naturally occurring radioactive material); and global fallout as it exists in the environment from the testing of nuclear explosive devices or from past nuclear accidents such as Chernobyl that contribute to background radiation and are not under the control of the State licensee or licensee. "Background radiation" does not include radiation from source, byproduct, or special nuclear materials regulated by the U.S. Nuclear Regulatory Commission or from naturally occurring or accelerator produced radioactive materials regulated by the State.

"Calendar quarter" means not less than 12 consecutive weeks nor more than 14 consecutive weeks. The first calendar quarter of each year shall begin in January and subsequent calendar quarters shall be so arranged that no day in any year is omitted from inclusion within a calendar quarter. For purposes of this chapter, no State licensee, licensee, radioactive materials registrant or registrant shall change the method observed by him of determining calendar quarters except at the beginning of a calendar year.

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

"Controlled area" means any area to which the access, occupancy and activity of those within are subject to control and supervision for the purpose of radiation protection.

"Dead-man switch" means a switch which can be kept closed only when the operator applies continuous pressure.

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

"Dose equivalent" means a numerical quantity that expresses on a common scale for all ionizing radiation, a

measure of the postulated effect on a given organ. It is defined as the absorbed dose in rads times certain modifying factors. The unit of dose is the Rem. (See "Rem" under (b) below).

"Dose rate" means dose per unit time.

"Emergency exposure" means an exposure to radiation of an emergency worker during rescue or other emergency operations.

"Emergency worker" means a member of the owner's staff or of a public voluntary or governmental agency engaged in safety or other emergency operations.

"Exemption" means the administrative relief from the requirements of a substantive rule.

"Healing art" means the practice of any branch of medicine or surgery, any method of diagnosis of human ailment, disease, pain, injury, deformity, mental or physical condition.

"Inspection" means an official examination or observation including but not limited to tests, surveys, and monitoring to determine compliance with rules, regulations, orders, requirements and conditions of the Department.

"Installation" means a radiation source, with its associated equipment, and the area in which it is housed.

"Instructed individual" means an individual who has received appropriate instructions as to the safe means and methods of performing work with or near radiation sources.

"Ionizing radiation" means any form of radiation which has the capability of ionizing the medium through which it is passing.

"Maximum permissible dose" means the maximum dose to which the body or a particular part of the body of a person shall be permitted to be exposed continuously or intermittently in a stated period of time.

"Nonionizing radiation" means any form of radiation which does not have the capability of ionizing the medium through which it is passing.

"Occupational dose" means the dose received by an individual in the course of employment in which the individual's assigned duties involve exposure to radiation from a machine source or to radioactive material from State licensed and unlicensed sources of radiation, whether in the possession of the State licensee, licensee or other person. Occupational dose does not include dose received from background radiation, from any medical administration the individual has received, from exposure to individuals administered radioactive material and released in accordance with Federal regulations found in Title 10 Code of Federal Regulations, Part 35, section 75, or as a member of the public.

"Owner" means a person who has title to a radiation source or who possesses a radiation source as a lessee, bailee or pursuant to the terms of a license issued by the Department, by a Federal agency, or by any other state.

"Person" includes an individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, municipality, any state, or other legal entity; and any legal successor, representative agent, or agency of the foregoing.

"Personnel-monitoring equipment" means devices designed to be worn or carried by an individual for the purpose of measuring the dose received; for example, film badges, pocket chambers, pocket dosimeters, and thermoluminescent dosimeters.

"Qualified individual" means an individual suited by training and experience to perform dependable radiation surveys and to determine the degree of radiation hazard.

"Radiation" includes any or all of the following: electromagnetic radiation including radiofrequency, microwave, infrared, visible, ultraviolet, x-ray, or gamma ray; sonic, infrasonic, or ultrasonic waves; and particle radiation including alphas, betas, high energy electrons, neutrons, protons, and other atomic or nuclear particles.

"Radiation area" means an area which is accessible to a worker and in which there exists ionizing radiation at such levels that a major portion of the body would receive in any one hour a dose equivalent in excess of five millirems or in any workweek a dose equivalent in excess of 100 millirems; or levels of nonionizing radiation which exceed the maximum permissible levels of such radiation as specified in the rules and standards established by the Commission.

"Research and development" means theoretical analysis, exploration, or experimentation; or the extension of investigative findings and theories of a scientific or technical nature into practical application for experimental production and testing of models, devices, equipment, materials and processes. "Research and development" does not include the internal or external administration of radioactive material, or of radiation, to human beings.

"Shielding" means any material introduced into the path of radiation to reduce the radiation level.

"Source of radiation" means a material, equipment or machine emitting or capable of emitting radiation.

"State" means the State of New Jersey.

"State license" means a license issued by the Department. See also "License" under (b) below.

"State licensee" means a person who is required to obtain a license from the Department pursuant to this chapter.

"Radiating device" means the antenna, leakage port, or any other part of a device that emits radio frequency electromagnetic energy.

"Radio frequency" means the frequency range of 300 kilohertz (kHz) to 100 gigahertz (GHz).

"Radio frequency device" means any stationary device, machine, equipment or installation which is capable of generating a radio frequency electromagnetic field. This does not include devices which are marketed as consumer products, including, but not limited to citizens band radios, remote controlled toys, remote controlled garage door openers, mobile radio transmitter under authorization of the Federal Communications Commission or any other device specifically exempted by the Commission on Radiation Protection as not presenting a potential hazard or harm to a worker or the public.

"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).
Amended by R.2005 d.156, effective May 16, 2005.
See: 36 N.J.R. 2336(a), 37 N.J.R. 1826(a).
Rewrote the section.

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, Radiation Protection Programs, PO Box 415, Trenton, New Jersey 08625–0415. The physical location of the office is 25 Arctic Parkway, Ewing, New Jersey 08638.

(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. Radiation Protection Programs
   New Jersey Department of Environmental Protection
   25 Arctic Parkway
   Ewing, NJ 08638
   Telephone: 609–984–5555
   Hours: 8:00 A.M. to 5:00 P.M. daily, except Saturday, Sunday, and Holidays
   After hours and weekends: 609–292–7172
2. Communications Officer
   New Jersey State Police Office of Emergency Management
   West Trenton, NJ 08628
   Telephone: 609–882–2000
   Hours: 24 hours, seven days.

Amended by R.2000 d.120, effective March 20, 2000.
See: 31 N.J.R. 3007(a), 32 N.J.R. 1016(a).
Rewrote the section.

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

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

(a) No person shall manufacture, use, operate, receive, possess, dispose, transfer, distribute or arrange for the distribution, sell, lease, 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 manufacture, use, operate, receive, possess, dispose, transfer, distribute or arrange for the distribution, sell, lease, install, transport or store sources of ionizing radiation in a manner other than prescribed in this chapter.

Amended by R.2005 d.156, effective May 16, 2005.
See: 36 N.J.R. 2336(a), 37 N.J.R. 1826(a).
Inserted references to manufacture, distribution, sales, and leasing of sources of ionizing radiation throughout.

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 State 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.

Amended by R.2005 d.156, effective May 16, 2005.
See: 36 N.J.R. 2336(a), 37 N.J.R. 1826(a).

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, Dose Limits.

Amended by R.2005 d.156, effective May 16, 2005.
See: 36 N.J.R. 2336(a), 37 N.J.R. 1826(a).
Substituted ", Dose Limits" for "Permissible Dose Rates, Radiation Levels and Concentrations" following the N.J.A.C. reference.

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.

Amended by R.2005 d.156, effective May 16, 2005.
See: 36 N.J.R. 2336(a), 37 N.J.R. 1826(a).
Inserted "radioactive materials" preceding "registrant".

7:28–3.9 Sale, installation, relocation or disposal of ionizing radiation-producing machines

(a) Whenever a manufacturer or dealer sells, installs, relocates or disposes of an ionizing radiation-producing machine, said manufacturer, agent or dealer shall give written notification thereof to the Department within 30 days of such sale, installation, relocation or disposal. Said notification shall include the manufacturer, model and serial number of each component, name and address of the new owner(s), address of the relocated machine or details of the final disposition of the machine. Notification shall be submitted on a form available from the Department. The Department may accept the current form used by the United States Food and Drug Administration for Report of Assembly of a Diagnostic X-ray System if the Department determines that the information is complete and accurate.

(b) Whenever an owner sells, relocates or disposes of an ionizing radiation-producing machine, said owner shall:

1. Give written notification to the Department on forms available from the Department within 30 days of such sale, relocation or disposal;

2. Include the New Jersey registration number, manufacturer, model and serial number of each component;

3. Include the name and address of the new owner(s); and

4. Include the address of the relocated machine, or details of the final disposition of the machine; and

5. Be responsible for all fees until the written notification is received by the Department.

7:28–3.10 Denial of an application for registration, and suspension, modification, or revocation of registration of ionizing radiation-producing machines, radioactive by-product material, source material or special nuclear material

(a) The Department, in addition to any penalties authorized by the Act, may deny an application for registration or suspend, modify or revoke a registration of ionizing radiation-producing machines, radioactive by-product material, source material or special nuclear material by reason of amendments to the Act, adoption of rules, orders issued by the Department pursuant to said Act or if the applicant, radioactive materials registrant or registrant:

1. Fails to comply with any provisions of the Act or any rules promulgated pursuant thereto including the timely payment of registration fees;

2. Falsifies or makes misleading statements in the application for registration;

3. Falsifies or makes misleading statements in any documents which were utilized to obtain a registration;

4. Alters registration documents;

5. Falsifies required records;

6. Aids, abets, combines with, or conspires with any person for any purpose which will evade or be in violation of the provisions of the Act or any rules promulgated pursuant thereto; or

7. Allows a registration to be used by any person for any purpose which will evade or be in violation of the provisions of the Act or any rules promulgated pursuant thereto.

(b) Except as provided in N.J.S.A. 26:2D–12 in cases of emergency, no registration shall be denied, modified, suspended or revoked prior to a hearing conducted by the Office of Administrative Law pursuant to N.J.S.A. 52:14B–1 et seq., the Administrative Procedure Act, and N.J.A.C. 1:1–1 et seq., the Uniform Administrative Practice Rules, on the basis of a Notice of Intent filed by the Department stating the grounds for denial, suspension, modification or revocation of a registration.

(c) The Department may terminate a registration upon request submitted by the radioactive materials registrant or registrant to the Department in writing.

Amended by R.2005 d.156, effective May 16, 2005.
See: 36 N.J.R. 2336(a), 37 N.J.R. 1826(a).
Inserted a reference to a radioactive materials registrant in (a) and (c).

7:28–3.11 Table of radioactive materials and quantities exempt from registration

(a) The following radioactive materials, in quantities less than or equal to those specified below, are exempt from registration:

Radioactive Material	Column A Not as a sealed source (microcuries)	Column B As a sealed source (microcuries)
Antimony (Sb 124)	1	10
Arsenic 76 (As 76)	10	10
Arsenic 77 (As 77)	10	10
Barium 140 + Lanthanum 140 (Ba 140 + La 140)	1	10
Beryllium (Be 7)	50	50
Cadmium 109 + Silver 109 (Cd 109 + Ag 109)	10	10
Calcium 45 (Ca 45)	10	10
Carbon 14 (C 14)	50	50
Cerium 144 + Praseodymium 144 (Ce 144 + Pr 144)	1	10
Cesium 137 + Barium 137 (Ce 137 + Ba 137)	1	10
Chlorine 36 (Cl 36)	1	10
Chromium 51 (Cr 51)	50	50
Cobalt 60 (Co 60)	1	10
Copper 64 (Cu 64)	50	50
Europium 154 (Eu 154)	1	10

Radioactive Material	Column A Not as a sealed source (microcuries)	Column B As a sealed source (microcuries)
Fluorine 18 (F 18)	50	50
Gallium 72 (Ga 72)	10	10
Germanium 71 (Ge 71)	50	50
Gold 198 (Au 198)	10	10
Gold 199 (Au 199)	10	10
Hydrogen 3 (Tritium H 3)	250	250
Indium 114 (In 114)	1	10
Iodine 131 (I 131)	10	10
Iridium 192 (Ir 192)	10	10
Iron 55 (Fe 55)	50	50
Iron 59 (Fe 59)	1	10
Lanthanum 140 (La 140)	10	10
Manganese 52 (Mn 52)	1	10
Manganese 56 (Mn 56)	50	50
Molybdenum 99 (Mo 99)	10	10
Nickel 59 (Ni 59)	1	10
Nickel 63 (Ni 63)	1	10
Niobium 95 (Nb 95)	10	10
Palladium 109 (Pd 109)	10	10
Palladium 103 + Rhodium 103 (Pd 103 + Rh 103)	50	50
Phosphorus 32 (P 32)	10	10
Polonium 210 (Po 210)	0.1	1
Potassium 42 (K 42)	10	10
Praseodymium 143 (Pr 143)	10	10
Promethium 147 (Pm 147)	10	10
Rhenium 186 (Re 186)	10	10
Rhodium 105 (Rh 105)	10	10
Rubidium 86 (Rb 86)	10	10
Ruthenium 106 + Rhodium 106 (Ru 106 + Rh 106)	1	10
Samarium 153 (Sm 153)	10	10
Scandium 46 (Sc 46)	1	10
Silver 105 (Ag 105)	1	10
Silver 111 (Ag 111)	10	10
Sodium 22 (Na 22)	10	10
Sodium 24 (Na 24)	10	10
Strontium 89 (Sr 89)	1	10
Strontium 90 + Yttrium 90 (Sr 90 + Y 90)	0.1	1
Sulfur 35 (S 35)	50	50
Tantalum 182 (Ta 182)	10	10
Technetium 96 (Tc 96)	1	10
Technitium 99 (Tc 99)	1	10
Tellurium 127 (Te 127)	10	10
Tellurium 129 (Te 129)	1	10
Thallium 204 (Tl 204)	50	50
Tin 113 (Sn 113)	10	10
Tungsten 185 (W 185)	10	10
Vanadium 48 (V 48)	1	10
Yttrium 90 (Y 90)	1	10
Yttrium 91 (Y 91)	1	10
Zinc 65 (Zn 65)	10	10
Beta and/or Gamma emitting radioactive material not listed above	1	10

7:28–3.12 Application and annual registration renewal fees for ionizing-radiation-producing machines

(a) On initial registration of each x-ray tube, each registrant shall pay an application fee of $40.00 plus the prorated portion of the applicable annual registration renewal fee set forth in (b), (c), (d) or (e) below for the remainder of the first year of registration.

(b) Each registrant of an ionizing-radiation-producing machine used in a dental facility shall pay:

1. The initial application and registration fees for each x-ray tube pursuant to (a) above, and

2. In each year after the expiration of the first year of registration established pursuant to (f) below, the annual registration renewal fee per x-ray tube as follows:

DENTAL FACILITIES

Machine Category and Description		Annual Registration Renewal Fee Per X-Ray Tube
01D	Dental Machine	$92

(c) Each registrant of an ionizing-radiation-producing machine used in a hospital facility shall pay:

1. The initial application and registration fees for each X-ray tube pursuant to (a) above; and

2. In each year after the expiration of the first year of registration establish pursuant to (f) below, the annual registration renewal fee per X-ray tube follows:

HOSPITAL FACILITIES

Machine Category and Description		Annual Registration Renewal Fee Per X-Ray Tube
01H	Dental Machine	$140.00
02H	Fixed Medical Radiographic Machine	208.00
03H	Mobile Medical Radiographic Machine	208.00
31H	Portable Medical Radiographic Machine (hand carried)	208.00
06H	Motor Vehicle Mounted Medical Radiographic Machine	208.00
04H	Fixed Medical Fluoroscopic Machine	163.00
05H	Mobile Medical Fluoroscopic Machine	163.00
32H	Portable Medical Fluoroscopic Machine (hand carried)	163.00
33H	Motor Vehicle Mounted Medical Fluroscopic Machine	163.00
07H	Fixed Medical Radiographic Fluoroscopic Machine	253.00
08H	Mobile Medical Radiographic Fluoroscopic Machine	253.00
34H	Portable Medical Radiographic Fluoroscopic Machine (hand carried)	253.00
35H	Motor Vehicle Mounted Medical Radiographic Fluoroscopic Machine	253.00
09H	CT Scan Machine	163.00
10H	Mammography Machine	298.00
36H	Motor Vehicle Mounted Mammography Machine	298.00
37H	Mobile Mammography Machine	298.00
44H	MQSA Mammography Machine	73.00

Machine Category and Description		Annual Registration Renewal Fee Per X-Ray Tube
45H	MQSA Motor Vehicle Mounted Mammography Machine	73.00
46H	MQSA Mobile Mammography Machine	73.00
11H	Medical Therapeutic Machine 60 kVp	253.00
12H	Medical Therapeutic Machine 61 kVp to 999 kVp	253.00
14H	Medical Therapeutic Machine 1 MeV and above	343.00
30H	Radiation Therapy Simulator Machine	208.00
38H	Biomedical (non-human) Research Machine	140.00
21H	Electron Microscope Machine	140.00
22H	Cabinet X-ray Machine	140.00
28H	Bone Densitometer Machine	118.00

(d) Each registrant of an ionizing-radiation-producing machine used in a non-hospital facility (including but not limited to doctors' offices, medical facilities, industrial facilities, schools, and government facilities) shall pay:

1. The initial application and registration fees for each X-ray tube pursuant to (a) above; and

2. In each year after the expiration of the first year of registration established pursuant to (f) below, the annual registration renewal fee per X-ray tube as follows:

NON-HOSPITAL FACILITIES

Machine Category and Description		Annual Registration Renewal Fee Per X-Ray Tube
01N	Dental Machine	$106.00
02N	Fixed Medical Radiographic Machine	140.00
03N	Mobile Medical Radiographic Machine	140.00
31N	Portable Medical Radiographic Machine (hand carried)	140.00
06N	Motor Vehicle Mounted Medical Radiographic Machine	140.00
04N	Fixed Medical Fluoroscopic Machine	118.00
05N	Mobile Medical Fluoroscopic Machine	118.00
32N	Portable Medical Fluoroscopic Machine (hand carried)	118.00
33N	Motor Vehicle Mounted Medical Fluoroscopic Machine	118.00
07N	Fixed Medical Radiographic Fluoroscopic Machine	163.00
08N	Mobile Medical Radiographic Fluoroscopic Machine	163.00
34N	Portable Medical Radiographic Fluoroscopic Machine (hand carried)	163.00
35N	Motor Vehicle Mounted Medical Radiographic Fluoroscopic Machine	163.00
09N	CT Scan Machine	118.00
10N	Mammography Machine	298.00
36N	Motor Vehicle Mounted Mammography Machine	298.00
37N	Mobile Mammography Machine	298.00
44N	MQSA Mammography Machine	73.00
45N	MQSA Motor Vehicle Mounted Mammography Machine	73.00
46N	MQSA Mobile Mammography Machine	73.00
11N	Medical Therapeutic Machine ≤60 kVp	118.00
12N	Medical Therapeutic Machine >61 kVp to 999 kVp	253.00
14N	Medical Therapeutic Machine 1 MeV and above	343.00
30N	Radiation Therapy Simulator Machine	208.00
38N	Biomedical (non-Human) Research Machine	140.00
17N	Industrial/Research Radiography Machine	151.00
39N	Portable Industrial Radiography Machine	151.00
40N	Shielded Room Radiography Machine	151.00
18N	Electron Beam Welder/Furnace Machine	129.00
19N	Analytical X-ray Machine ≤16 kVp	118.00
20N	Analytical X-ray Machine >16 kVp	118.00
21N	Electron Microscope Machine	106.00
22N	Cabinet X-ray Machine	106.00
23N	X-ray Baggage Machine	106.00
24N	Particle Accelerator Machine (non-medical use) ≤30 kVp	196.00
25N	Particle Accelerator Machine (non-medical use) >30 kVp	185.00
28N	Bone Densitometer Machine	95.00
41N	Machine not specifically listed above, ≤50 kVp	118.00
42N	Machine not specifically listed above, 51 kVp to 999 kVp	118.00
43N	Machine not specifically listed above, 1 MeV and above	140.00

(e) Each registrant of an ionizing-radiation-producing machine used in a veterinary facility shall pay:

1. The initial application and registration fees for each X-ray tube pursuant to (a) above, and

2. In each year after the expiration of the first year of registration established pursuant to (f) below, the annual registration renewal fee per X-ray tube as follows:

VETERINARY FACILITIES

Machine Source Category and Description		Annual Registration Renewal Fee Per X-Ray Tube
01V	Dental Machine	$ 86.00

Machine Source Category and Description		Annual Registration Renewal Fee Per X-Ray Tube
02V	Fixed Medical Radiographic Machine	100.00
03V	Mobile Medical Radiographic Machine	100.00
31V	Portable Medical Radiographic Machine (hand carried)	100.00
04V	Fixed Medical Fluoroscopic Machine	91.00
05V	Mobile Medical Fluoroscopic Machine	91.00
32V	Portable Medical Fluoroscopic Machine (hand carried)	91.00
07V	Fixed medical Radiographic Fluoroscopic Machine	109.00
08V	Mobile Medical Radiographic Fluoroscopic Machine	109.00

(f) The expiration date of each year of registration shall be specified by the Department on the billing invoice sent to each registrant. The registration expiration date shall be based on the first letter of the registrant name as follows:

1. For a registrant whose name begins with A through F, the registration expiration date shall be August 31 of each calendar year;

2. For a registrant whose name begins with G through L, the registration expiration date shall be September 30 of each calendar year;

3. For a registrant whose name begins with M through R, the registration expiration date shall be October 31 of each calendar year; and

4. For a registrant whose name begins with S through Z, the registration expiration date shall be November 30 of each calendar year.

(g) Each registrant shall pay the initial registration application fee and annual registration renewal fee within 60 days of the date of the invoice billing issued by the Department. Any fee payment postmarked or handcarried to the Department after the invoice due date will be subject to a $25.00 per month late charge. If necessary, the Department will issue a second invoice. Late charges must be paid within 30 days of the second invoice. If a registrant fails to pay a fee by the original invoice due date, the registration of the ionizing-radiation-producing machine shall be deemed expired.

(h) When two or more X-ray tubes are operated from the same generator, the registrant shall pay an application fee and an annual registration renewal fee for each tube.

(i) Each registrant shall make payment only by check or money order made payable to "Treasurer, State of New Jersey." Each payment shall be accompanied by the invoice issued by the Department and shall be submitted to the address specified on the invoice: Bureau of Revenue, PO Box 417, Trenton, New Jersey 08625–0417.

(j) An application fee will not be charged for any machine registered pursuant to the Radiation Protection Code prior to November 16, 1987. However, the registrant shall pay the applicable annual registration renewal fee for any such machine.

Amended by R.1990 d.400, effective August 6, 1990.
See: 22 N.J.R. 1653(a), 22 N.J.R. 2302(a), 22 N.J.R. 2830(a).
Fees increased.
Repeal and New Rule, R.1995 d.49, effective January 17, 1995.
See: 26 N.J.R. 3797(a), 27 N.J.R. 336(a).
Formerly "Fees for initial registration application and annual registration of ionizing radiation-producing machines".
Amended by R.1999 d.369, effective October 18, 1999.
See: 31 N.J.R. 1130(a), 31 N.J.R. 3087(c).
In (c)2 and (d)2, inserted references to MQSA Mammography Machines, MQSA Motor Vehicle Mounted Mammography Machines and MQSA Mobile Mammography Machines.

7:28–3.13 Fees for registration of radioactive by-product material, source material and special nuclear material

(a) Fees for initial registration, annual registration renewal and each registration amendment for possession, custody or control of radioactive by-product material, source material and special nuclear material as provided below shall be paid in full by the radioactive materials registrant.

1. Initial Registration Fee: $250.00;
2. Annual Registration Renewal: $165.00;
3. Each Amendment to Registration: $165.00.

(b) Payment for each initial registration shall be made only by check or money order payable to "Treasurer, State of New Jersey" and shall be submitted with each initial registration application to the Department.

(c) Annual registration renewal fees payable to "Treasurer, State of New Jersey" shall be submitted to the Department annually no later than August 1 of each year.

(d) In the event that registration renewal fees are paid later than 30 days after August 1, a delinquency fee equal to one-half of the annual registration fee will be imposed. Failure to pay a registration renewal fee, including any accrued delinquency fees for longer than 90 days after August 1 shall constitute grounds for suspension or revocation of the registration pursuant to N.J.A.C. 7:28–3.10.

(e) Registration amendment fees shall be submitted with the amended registration.

(f) The initial registration fee, the annual renewal fee and registration amendment fee shall be mailed to:

State of New Jersey
Department of Environmental Protection
Bureau of Revenue
428 East State Street
Trenton, New Jersey 08625–0402

(g) The registration year shall be July 1 of each year to June 30 of the following year.

(h) Fees submitted to the Department are non-refundable.

New Rule, R.1991 d.417, effective August 5, 1991.
See: 23 N.J.R. 3300(a), 23 N.J.R. 2362(a).
Amended by R.2005 d.156, effective May 16, 2005.
See: 36 N.J.R. 2336(a), 37 N.J.R. 1826(a).
Rewrote (a); in (d), substituted "registration" for "license" following "annual" in the first sentence; added (h).

SUBCHAPTER 4. LICENSING OF NATURALLY OCCURRING OR ACCELERATOR PRODUCED RADIOACTIVE MATERIALS

7:28–4.1 Scope and general provisions

(a) This subchapter shall apply to persons who manufacture, produce, transfer, distribute or arrange for the distribution, sell, lease, receive, acquire, own, possess or use any naturally occurring or accelerator produced radioactive materials, including TENORM, in this State.

(b) No person shall manufacture, produce, transfer, distribute or arrange for the distribution, sell, lease, receive, acquire, own, possess or use any naturally occurring or accelerator produced radioactive materials, including TENORM, in this State unless authorized by a specific State license issued by the Department as provided by N.J.A.C. 7:28–4.7 and 4.8, a general State license as provided in N.J.A.C. 7:28–4.5, or an exemption as provided in N.J.A.C. 7:28–4.3. Excepted from this provision are byproduct, source and special nuclear materials.

(c) A person who sells, transfers, distributes or arranges for the distribution of a device containing naturally occurring or accelerator produced radioactive materials manufactured by another person, but which is sold, transferred or distributed under its own name, shall obtain a State license in accordance with this subchapter.

Amended by R.2005 d.156, effective May 16, 2005.
See: 36 N.J.R. 2336(a), 37 N.J.R. 1826(a).
Rewrote the section.

7:28–4.2 Recognition of licenses from other jurisdictions

(a) Any person who possesses a specific license or equivalent licensing document issued by a Federal agency or any other state may, pursuant to such document, transport, receive, possess, or use the radioactive materials specified in such license within this State for a period not in excess of 20 days in any period of 12 consecutive months without obtaining a specific license from the Department provided that:

1. The license does not limit the activity to specified installations or locations;

2. The licensee notifies the Department in writing at least two days prior to the time that such radioactive material is brought into this State. Such notification shall indicate the location, period, and type of proposed possession and use within this State, and shall be accompanied by a copy of the pertinent licensing document. If in a specific case the two-day period would impose an undue hardship on the user, he may, upon application to the Department, obtain permission to proceed sooner;

3. The licensee complies with all the terms and conditions of the license;

4. The licensee provides such other information as the Department may request; and

(b) The Department may withdraw, limit or qualify its acceptance of such licenses issued by another agency, or any product distributed pursuant to such licensing documents, upon determining that such action is necessary in order to prevent undue hazard to public health and safety or property.

Amended by R.2005 d.156, effective May 16, 2005.
See: 36 N.J.R. 2336(a), 37 N.J.R. 1826(a).
In (b), substituted "product" for "produce" preceding "distributed".

7:28–4.3 Exemption from requirement for a State license for manufacture, production, transfer, distribution or arrangement of distribution, sale, lease, receipt, acquisition, ownership, possession or use of all naturally occurring or accelerator produced radioactive materials

(a) A person shall be exempt from the requirement to obtain a State license for the following activities:

1. The person is a plant or laboratory owned by or operated on behalf of a Federal agency;

2. The person is a common or contract carrier and is transporting or storing radioactive materials covered by N.J.A.C. 7:28–4.7 in the regular course of carriage for another, or storage incident thereto;

3. The person manufactures, produces, receives, possesses, uses, transfers, distributes or arranges for the distribution, sells, leases, owns or acquires products or materials containing naturally occurring or accelerator produced radioactive materials in concentrations not in excess of those exempted in N.J.A.C. 7:28–4.3(b);

4. The person manufactures, receives, possesses, uses, transfers, distributes or arranges for the distribution, sells, leases, owns or acquires luminous timepieces or parts thereof containing radium. However, any person who desires to apply radium to luminous timepieces or parts thereof is not exempt and must obtain a specific State license;

5. The person owns or possesses naturally occurring radioactive materials, occurring in natural abundance and which are not technologically enhanced naturally occur-

ring radioactive materials, whether intentionally or unintentionally;

6. The person who receives, owns, possesses, uses, processes, transfers, distributes, arranges for the distribution, sells or leases technologically enhanced naturally occurring radioactive materials (TENORM) if the TENORM contain any combination of Radium–226 and Radium–228 at concentrations less than five pCi/g (185 Bq/kg) (dry weight) above background and less than the quantity listed in (c) below;

7. The person owns property where radon gas is being expelled to the outside atmosphere as part of a radon remediation system installed in accordance with the provisions of N.J.A.C. 7:28–27;

8. The person owns a sanitary sewer system where residuals are present which may contain TENORM from the separation of liquids and solids which is the outcome of normal operations of the sanitary sewer system;

9. The person is involved with the distribution, including custom blending, possession, and use of fertilizers containing TENORM; and

10. The person owns property where residual contamination remaining at the site was remediated under the Radiation Protection Act (N.J.S.A. 26:2D–1 et seq.) and/or the other authorities listed in the Soil Remediation Standards at N.J.A.C. 7:28–12.2(a). Such residual concentrations may be greater than the limits specified in (a)6 above, but be under restricted conditions imposed by the Department (such as engineering and institutional controls), and meet the dose criteria specified in N.J.A.C. 7:28–12.8(a).

(b) The following concentrations of NARM, including TENORM, when obtained from naturally occurring materials or when produced by an accelerator are exempt from the requirements for a State license:

Exempt Concentrations

Element (nuclide)	Column 1 Gas concentration (uCi/ml)	Column 2 Liq. & solid concentration (uCi/ml)****
Argon (Ar–37)	1×10^{-3}	—
Arsenic (As–73)	—	5×10^{-3}
(As–74)	—	5×10^{-4}
Barium (Ba–131)	—	2×10^{-3}
Beryllium (Be–7)	—	2×10^{-2}
Bismuth (Bi–206)	—	4×10^{-4}
(Bi–207)*	—	2×10^{-4}
Cadmium (Cd–109)	—	2×10^{-3}
Chromium (Cr–51)	—	2×10^{-2}
Cobalt (Co–56)*	—	1.2×10^{-4}
(Co–57)	—	5×10^{-3}
(Co–58)	—	1×10^{-3}
Dysprosium (Dy–159)*	—	4×10^{-3}
Fluorine (F–18)	2×10^{-6}	8×10^{-3}
Gallium (Ga–67)*	—	2×10^{-3}
Germanium (Ge–68)*	—	1.2×10^{-3}
(Ge–71)	—	2×10^{-2}
Gold (Au–196)	—	2×10^{-3}
(Au–199)	—	2×10^{-3}
Indium (In–111)*	—	1.2×10^{-3}
(In–113m)	—	1×10^{-2}
Iodine (I–123)*	4×10^{-7}	2×10^{-3}
(I–124)*	8×10^{-9}	4×10^{-5}
Iridium (Ir–190)	—	2×10^{-3}
(Ir–192)	—	4×10^{-4}
Iron (Fe–55)	—	8×10^{-3}
Krypton (Kr–85m)	1×10^{-6}	—
Lead (Pb–201)*	—	2×10^{-3}
(Pb–203)	—	4×10^{-3}
(Pb–210)*	—	2×10^{-7}
Manganese (Mn–52)	—	3×10^{-4}
(Mn–54)	—	1×10^{-3}
Mercury (Hg–197m)	—	2×10^{-3}
(Hg–197)	—	3×10^{-3}
Neptunium (Np–237)*	—	4×10^{-7}
Palladium (Pd–103)	—	3×10^{-3}
Platinum (Pt–191)	—	1×10^{-3}
(Pt–193m)	—	1×10^{-2}
(Pt–197m)	—	1×10^{-2}
Radium (Ra–226)*	—	1.2×10^{-6}
(Ra–228)	—	4×10^{-11}
Rhenium (Re–183)	—	6×10^{-3}
Rubidium (Rb–81)*	—	1×10^{-2}
(Rb–83)*	—	1.8×10^{-4}
(Rb–84)*	—	1.4×10^{-4}
Ruthenium (Ru–97)	—	4×10^{-4}
Samarium (Sm–153)	—	8×10^{-4}
Scandium (Sc–48)	—	3×10^{-4}
Silver (Ag–105)	—	1×10^{-3}
(Ag–111)	—	4×10^{-4}
Sodium (Na–22)*	—	1.2×10^{-4}
Tantalum (Ta–179)*	—	6×10^{-3}
Technetium (Tc–96)	—	1×10^{-3}
Thallium (Tl–200)	—	4×10^{-3}
(Tl–201)	—	3×10^{-3}
(Tl–202)	—	1×10^{-3}
**Thorium (Th–228)*	—	4×10^{-6}
(Th–230)*	—	2×10^{-6}
(Th–232)*	—	6×10^{-7}
(Th–234)*	—	1×10^{-4}
Thulium (Tm–170)	—	5×10^{-4}
Tungsten (Wolfram) (W–181)	—	4×10^{-3}
**Uranium (U–234)*	—	6×10^{-6}
(U–235)*	—	6×10^{-6}
(U–238)*	—	6×10^{-6}
Vanadium (V–48)	—	3×10^{-4}
Yttrium (Y–88)*	—	2×10^{-4}
(Y–92)	—	6×10^{-4}
Zinc (Zn–69m)	—	7×10^{-4}
Any other beta/gamma emitter with half-life < 3 years	1×10^{-10}	1×10^{-6}

*The values for those NARM nuclides, including TENORM, that are followed by a single asterisk(*) are based upon multiplying 20 times the most restrictive release concentrations specified in 10 CFR 20 Appendix B, Table 2, Columns 1 (air) and 2 (water).

**These concentrations do not apply to source material as defined by the NRC for thorium and uranium.
***uCi/g for solids

1. Many radioisotopes disintegrate into isotopes which are also radioactive. In expressing the concentrations in this section, the value given is that of the parent isotope and takes into account the radioactivity of the daughters.

2. For purposes of N.J.A.C. 7:28–4.3(a)3, where a combination of isotopes is involved, the limit for the combination shall be computed as follows:

i. Determine for each isotope in the product the ratio between the concentration present in the product and the exempt concentration established in this section for the specific isotope when not in combination. The sum of such ratios may not exceed "1" (unity).

Example:

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

(c) If a person manufactures, produces, transfers, distributes or arranges for the distribution, sells, leases, receives, acquires, owns, possesses or uses NARM, including TENORM, in quantities less than those listed in N.J.A.C. 7:28–4.5(c), they are exempt from the requirement for a license.

Amended by R.2005 d.156, effective May 16, 2005.
See: 36 N.J.R. 2336(a), 37 N.J.R. 1826(a).
Rewrote the section.

7:28–4.4 Types of licenses for manufacture, production, transfer, distribution or arrangement for distribution, sale, lease, receipt, acquisition, ownership, possession or use of all naturally occurring or accelerator produced radioactive materials

(a) General State licenses described in N.J.A.C. 7:28–4.5 are effective without the filing of an application with the Department or the issuance of licensing documents to particular persons.

(b) Specific State licenses are issued to named persons upon application filed pursuant to the requirements of this subchapter.

Amended by R.2005 d.156, effective May 16, 2005.
See: 36 N.J.R. 2336(a), 37 N.J.R. 1826(a).

7:28–4.5 General licenses for the transfer, distribution or arrangement for distribution, sale, lease, receipt, acquisition, ownership, possession or use of naturally occurring or accelerator produced radioactive materials and certain devices and equipment

(a) Any person who uses, transfers, distributes or arranges for the distribution, sells, leases, receives, acquires, owns or possesses the following devices and equipment incorporating naturally occurring or accelerator produced radioactive material, when manufactured, tested and labeled by the manufacturer in accordance with the specifications contained in a specific license issued by the Department, or a specific license of a Federal agency or any other state, shall be deemed to have a general State license:

1. Devices designed for use as static eliminators and which contain, as a sealed source or sources, radioactive material consisting of a total of not more than 500 microcuries of Polonium 210 or 50 microcuries of Radium 226 per device;

2. Spark gap tubes and electronic tubes which contain radioactive material consisting of not more than one microcurie of Radium per tube;

3. Devices designed for ionizing of air and which contain, as a sealed source or sources, radioactive material consisting of a total of not more than 500 microcuries of Polonium 210 or 50 microcuries of Radium 226 per device.

(b) The devices described in (a) above shall not be transferred, abandoned or disposed of except by transfer to a person duly authorized to receive such device by a specific State license issued by the Department, a Federal agency, or any other state.

(c) The following quantities of radioactive substances, when obtained from naturally occurring materials or when produced by an accelerator, are generally licensed provided that no person shall at any one time possess or use more than a total of 10 such quantities:

Radioactive Material	Column A Not as a Sealed Source (microcuries)	Column B As a Sealed Source (microcuries)
Beryllium (Be–7)	50	50
Bismuth 207 (Bi–207)	1	10
Cadmium 109–Silver 109 (Cd 109 + Ag 109)	10	10
Cerium 141 (Ce–141)	1	10
Chromium 51 (Cr–51)	50	50
Cobalt 57 (Co–57)	20	20
Germanium 68 (Ge–68)	1	10
Iron 55 (Fe–55)	50	50
Manganese 52 (Mn–52)	1	10
Polonium 210 (Po–210)	0.1	1
Radium and daughters	0.1	1
Sodium 22 (Na–22)	10	10
Vanadium 48 (V–48)	1	10
Zinc 65 (Zn–65)	10	10
Beta and/or gamma emitting radioactive material not listed above	1	10

(d) There are no generally licensed quantities for alpha-emitting materials other than those set forth in N.J.A.C. 7:28–4.5(c).

(e) Any person who owns, receives, acquires, possesses or uses radioactive material when contained in a device designed and manufactured for the purpose of detecting, measuring, gauging or controlling thickness, density, level, interface location, radiation, leakage, or qualitative or quantitative chemical composition or for producing light or an ionized atmosphere, when such devices are manufactured in accordance with the specifications contained in a specific license authorizing distribution under a general license issued to the supplier by the Department, a Federal agency, or any other state, is deemed to have a general State license, provided that:

1. The device is labeled in accordance with the provisions of the specific license which authorizes the distribution of the devices;

2. The device bears a label containing the following or a substantially similar statement:

"This device contains radioactive material and has been manufactured for distribution as a generally licensed device pursuant to

_____

(identify appropriate section of the rules)

_____

(name of licensing agency and state)

License No. _____ by _____ (name of supplier)

This device shall not be transferred, abandoned or disposed of except by transfer to a person duly authorized to receive such device by a specific license issued by the Department, a Federal agency, or any other state.

Removal of this label is prohibited."; and

3. The devices requiring special installation shall be installed on the premises of the general licensee by a person authorized to install the devices under a specific license issued to the installer by the Department, a Federal agency, or any other state.

(f) Persons who transfer, distribute or arrange for the distribution, sell, lease, receive, acquire, own, possess or use items and quantities of radioactive materials set forth in N.J.A.C. 7:28–4.5(a) and (c) pursuant to a general State license shall not:

1. Effect an increase in the radioactivity of such scheduled items or quantities by adding other radioactive material thereto, by combining radioactive material from two or more such items or quantities, or by altering them in any other manner so as to increase the rate of radiation emission;

2. Administer or direct the administration of the scheduled items or quantities or any part thereof to a human being, either externally or internally, for any purpose, including, but not limited to, diagnostic, therapeutic and research purposes;

3. Add or direct the addition of the scheduled items or quantities or any part thereof to any food, beverage, cosmetic, drug or other product designed for ingestion or inhalation by, or application to, a human being; or

4. Include the scheduled items or quantities or any part thereof in any device, instrument, apparatus, including component parts and accessories intended for use in diagnosis, treatment or prevention of disease in human beings or animals or otherwise intended to affect the structure or any function of the body of human beings or animals.

(g) Persons who receive, acquire, possess or use a device pursuant to a general license specified in N.J.A.C. 7:28–4.5(a):

1. Shall not transfer, abandon or dispose of the device except by transfer to a person duly authorized to receive such device by a specific license issued by the Department, a Federal agency, or any other state;

2. Shall assure that all labels affixed to the device at the time of receipt and bearing the statement, "Removal of this label is prohibited", are maintained thereon and shall comply with the instructions contained in such labels;

3. Shall have the device tested for leakage of radioactive material and proper operation of the on-off mechanism and indicator, if any, at intervals not to exceed six months except that devices containing only tritium need not be tested for any purpose and devices containing only krypton need not be tested for leakage;

4. Shall have the tests required by N.J.A.C. 7:28–4.5(g)3 and all other services involving the radioactive material, its shielding and containment, performed by the supplier or other person duly authorized by a specific license issued by the Department, a Federal agency, or any other state to manufacture, install or service such devices;

5. Shall maintain records of all tests performed on the devices as required under N.J.A.C. 7:28–4.5(g)3, including the dates and results of the tests and the names and addresses of the persons conducting the tests;

6. Upon the occurrence of a failure of or damage to, or any indication of a possible failure of or damage to, the shielding or containment of the radioactive material or the on-off mechanism or indicator, shall immediately suspend operation of the device until it has been either:

i. Repaired by a supplier, manufacturer, or other person holding a specific license issued by the Department, a Federal agency, or any other state to manufacture, install or service such devices; or

ii. Disposed of by transfer to a person holding a specific license issued by the Department, a Federal agency, or any other state to receive the radioactive material contained in the device; and

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 all pertinent U.S. Department of Transportation regulations.

Amended by R.2000 d.120, effective March 20, 2000.
See: 31 N.J.R. 3007(a), 32 N.J.R. 1016(a).
In (b), deleted N.J.A.C. reference.

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. DOSE LIMITS

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.

(e) Except as authorized by the Department in writing, no allowance shall be made in subsection (d) of this Section or the use of protective clothing or equipment, or particle size.

1. The Department may authorize an owner to expose an individual in a controlled area to airborne concentrations in excess of the limits specified in Section 6.5(a) of this Chapter, Column B, upon receipt of an application demonstrating that the concentration is composed in whole or in part of particles of such size that such particles are not respirable and that the individual will not inhale concentrations in excess of the limits established in Section 6.5(a) of this Chapter, Column B. Each application under this paragraph shall include an analysis of particle size in the concentrations and a description of the methods used in determining the particle size.

2. The Department may authorize an owner to expose an individual in a controlled area to airborne concentrations in excess of the limits specified in Section 6.5(a) of this Chapter, Column B, upon receipt of an application demonstrating that the individual will wear appropriate protective equipment and that the individual will not inhale, ingest, or absorb quantities of radioactive material in excess of those which might otherwise be permitted under this Chapter for individuals in controlled areas during a 40–hour week. Each application under this paragraph shall contain the following information:

i. A description of the protective equipment to be employed, including the efficiency of the equipment for the material involved;

ii. Procedures for the fitting, maintenance, and cleaning of the protective equipment;

iii. Procedures governing the use of the protective equipment, including supervisory procedures and length of time the equipment will be used by the individuals in each workweek. The proposed periods for use of the equipment by an individual shall not be of such duration as would discourage observance by the individual of the proposed procedures; and

iv. The average concentrations present in the areas occupied by the individuals.

(f) The dose received by any individual under 18 years of age shall not exceed 10 percent of the limits established in (a) above nor shall such an individual be exposed to concentrations of radioactive material greater than those listed in N.J.A.C. 7:28–11 Appendix, Table 1, Column 1.

Amended by R.2005 d.156, effective may 16, 2005.
See: 36 N.J.R. 2336(a), 37 N.J.R. 1826(a).
Rewrote (f).

Case Notes

Successors to radium processor which disposed waste product on property were absolute liable to subsequent purchaser of property for damages caused by gamma radiation and radon gas from radium tailings. T & E Industries, Inc. v. Safety Light Corp., 227 N.J.Super. 228, 546 A.2d 570 (A.D.1988), certification granted 117 N.J. 118, 564 A.2d 848, certification granted 117 N.J. 119, 564 A.2d 848, affirmed as modified 123 N.J. 371, 587 A.2d 1249.

Processor is absolutely liable for damages resulting from processing of radium and disposal of its waste product. T & E Industries, Inc. v. Safety Light Corp., 227 N.J.Super. 228, 546 A.2d 570 (A.D.1988), certification granted 117 N.J. 118, 564 A.2d 848, certification granted 117 N.J. 119, 564 A.2d 848, affirmed as modified 123 N.J. 371, 587 A.2d 1249.

Absolute liability for damages resulting from processing of radium and disposal of its waste product is not limited to situations in which processing and disposal interferes with rights of neighboring property owners. T & E Industries, Inc. v. Safety Light Corp., 227 N.J.Super. 228, 546 A.2d 570 (A.D.1988), certification granted 117 N.J. 118, 564 A.2d 848, certification granted 117 N.J. 119, 564 A.2d 848, affirmed as modified 123 N.J. 371, 587 A.2d 1249.

Doctrine of caveat emptor is not defense to absolute liability claim by purchaser against prior landowner for damages unless purchaser knowingly accepts such burden. T & E Industries, Inc. v. Safety Light Corp., 227 N.J.Super. 228, 546 A.2d 570 (A.D.1988), certification granted 117 N.J. 118, 564 A.2d 848, certification granted 117 N.J. 119, 564 A.2d 848, affirmed as modified 123 N.J. 371, 587 A.2d 1249.

7:28–6.2 Dose limits for individual members of the public

(a) Each State licensee or registrant shall conduct operations as follows:

1. The total effective dose equivalent to individual members of the public from the State licensed or registered operation does not exceed 0.1 rem (one millisievert (mSv)) in a year, exclusive of the dose contributions from background radiation, from any medical administration the individual has received, from exposure to individuals administered radioactive material and released in accordance with Federal regulations at 10 CFR 35.75, and from the State licensee's disposal of radioactive material into a sanitary sewer system in accordance with N.J.A.C. 7:28–11.2; and

2. The dose in any unrestricted area from external sources, exclusive of the dose contribution from patients administered radioactive materials and released in accordance with Federal regulations at 10 CFR 35.75, does not exceed 0.002 rem (0.02 millisievert) in any one hour.

(b) If the State licensee or registrant permits members of the public to have access to controlled areas, the limits for members of the public as set forth in (a) above continue to apply to those individuals.

(c) Notwithstanding (a)1 above, a State licensee may permit visitors to a patient who cannot be released under 10 CFR 35.75 to receive a radiation dose greater than 0.1 rem (one mSv) per year if:

1. The radiation dose received does not exceed 0.5 rem (five mSv) annually; and

2. The authorized user, as defined in 10 CFR 35.2, has determined before the visit that it is appropriate.

(d) A registrant or State licensee may apply to the Department, which may approve upon recommendation from

the Commission, for authorization to conduct operations in such a manner that the annual dose received by an individual member of the public does not exceed 0.5 rem (five mSv). The registrant or State licensee shall include the following information in this application:

1. Demonstration of the need for and expected duration of operations in excess of the limit in (a) above;

2. A description of the registrant's or State licensee's program to assess and control dose within the 0.5 rem (five mSv) annual limit; and

3. The procedures to be followed to maintain the dose as low as is reasonably achievable.

(e) Transportation and packaging of radioactive materials must comply with all regulations of the U.S. Department of Transportation and all other agencies of the United States having jurisdiction.

(f) The Department may impose in a State license additional restrictions on radiation levels in unrestricted areas and on the total quantity of radionuclides that a State licensee may release in effluents (see N.J.A.C. 7:28–11 Appendix, Tables 1 and 2) in order to prevent exceedence of the collective dose.

Repeal and New Rule, R.2005 d.156, effective May 16, 2005.
See: 36 N.J.R. 2336(a), 37 N.J.R. 1826(a).
Section was "Radiation levels outside controlled areas".

7:28–6.3 Concentrations in effluents from controlled areas

Concentrations of radioactive materials in effluents from controlled areas shall meet the requirements of Sections 11.2 (Disposal by release into sanitary sewerage systems) and 11.3 (Disposal by discharges into the air, ground waters or surface waters) of this Chapter.

7:28–6.4 Exposures in the event of radiation incidents or emergencies

In the event of a radiation incident in which an employee or emergency worker receives more than the limits specified in Section 6.1(a) (Exposure of individuals in controlled areas) of this Chapter or in the event of emergency conditions in which immediate action required to minimize danger to life results in an employee or emergency worker receiving doses beyond the limits specified in Section 6.1(a) (Exposure of individuals in controlled areas) of this Chapter. Each employer shall take measures to limit additional exposures of his employees to an extent and for a period, which shall be subject to approval by the Department. All such doses shall be reported as required by Subchapter 13 (Reports of Thefts and Radiation Incidents) of this Chapter and shall be included in the records required by Subchapter 8 (Records) of this Chapter.

7:28–6.5 Average concentrations

(a) Maximum permissible average concentrations of radioactive materials in air and water shall be as follows:

Radionuclide		Occupational 40-hr. Week Water uc/ml	Air uc/ml
Column		**A**	**B**
Actinium 227	(sol.)	$6x10^{-5}$	$2x10^{-12}$
	(insol.)	$9x10^{-3}$	$3x10^{-11}$
Actinium 228	(sol.)	$3x10^{-3}$	$8x10^{-8}$
	(insol.)	$3x10^{-3}$	$2x10^{-8}$
Americium 241	(sol.)	10^{-4}	$6x10^{-12}$
	(insol.)	$8x10^{-4}$	10^{-10}
Americium 242m	(sol.)	$1x10^{-4}$	$6x10^{-12}$
	(insol.)	$3x10^{-3}$	$3x10^{-10}$
Americium 242	(sol.)	$4x10^{-3}$	$4x10^{-8}$
	(insol.)	$4x10^{-3}$	$5x10^{-8}$
Americium 243	(sol.)	10^{-4}	$6x10^{-12}$
	(insol.)	$8x10^{-4}$	10^{-10}
Americium 244	(sol.)	$1x10^{-1}$	$4x10^{-6}$
	(insol.)	$1x10^{-1}$	$2x10^{-5}$
Antimony 122	(sol.)	$8x10^{-4}$	$2x10^{-7}$
	(insol.)	$8x10^{-4}$	10^{-7}
Antimony 124	(sol.)	$7x10^{-4}$	$2x10^{-7}$
	(insol.)	$7x10^{-4}$	$2x10^{-8}$
Antimony 125	(sol.)	$3x10^{-3}$	$5x10^{-7}$
	(insol.)	$3x10^{-3}$	$3x10^{-8}$
Argon 37	(imm.)	. . .	$6x10^{-3}$
Argon 41	(imm.)	. . .	$2x10^{-6}$
Arsenic 73	(sol.)	0.01	$2x10^{-6}$
	(insol.)	0.01	$4x10^{-7}$
Arsenic 74	(sol.)	$2x10^{-3}$	$3x10^{-7}$
	(insol.)	$2x10^{-3}$	10^{-7}
Arsenic 76	(sol.)	$6x10^{-4}$	10^{-7}
	(insol.)	$6x10^{-4}$	10^{-7}
Arsenic	(sol.)	$2x10^{-3}$	$5x10^{-7}$
	(insol.)	$2x10^{-3}$	$4x10^{-7}$
Astatine 211	(sol.)	$5x10^{-5}$	$7x10^{-9}$
	(insol.)	$2x10^{-3}$	$3x10^{-8}$
Barium 131	(sol.)	$5x10^{-3}$	10^{-6}
	(insol.)	$5x10^{-3}$	$4x10^{-7}$
Barium 140	(sol.)	$8x10^{-4}$	10^{-7}
	(insol.)	$7x10^{-4}$	$4x10^{-8}$
Berkelium 249	(sol.)	0.02	$9x10^{-10}$
	(insol.)	0.02	10^{-7}
Berkelium 250	(sol.)	$6x10^{-3}$	$1x10^{-7}$
	(insol.)	$6x10^{-3}$	$1x10^{-6}$
Beryllium 7	(sol.)	0.05	$6x10^{-6}$
	(insol.)	0.05	10^{-6}
Bismuth 206	(sol.)	10^{-3}	$2x10^{-7}$
	(insol.)	10^{-3}	10^{-7}
Bismuth 207	(sol.)	$2x10^{-3}$	$2x10^{-7}$
	(insol.)	$2x10^{-3}$	10^{-8}
Bismuth 210	(sol.)	10^{-3}	$6x10^{-9}$
	(insol.)	10^{-3}	$6x10^{-9}$

99	Einsteinium-253	W, all compounds	2E-12	2E-6	2E-5
99	Einsteinium-254m	W, all compounds	1E-11	—	—
		LLI wall	—	4E-6	4E-5
99	Einsteinium-254	W, all compounds	—	—	—
		Bone surf	2E-13	2E-7	2E-6
100	Fermium-252	W, all compounds	2E-11	6E-6	6E-5
100	Fermium-253	W, all compounds	1E-11	1E-5	1E-4
100	Fermium-254	W, all compounds	1E-10	4E-5	4E-4
100	Fermium-255	W, all compounds	3E-11	7E-6	7E-5
100	Fermium-257	W, all compounds	—	—	—
		Bone surf	3E-13	5E-7	5E-6
101	Mendelevium-257	W, all compounds	—	1E-4	1E-3
		Bone surf	1E-10	—	—
101	Mendelevium-258	W, all compounds	—	—	—
		Bone surf	5E-13	6E-7	6E-6
—	Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life less than 2 hours	Submersion[a]	1E-9	—	—
—	Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life greater than 2 hours		1E-12	1E-8	1E-7
—	Any single radionuclide not listed above that decays by alpha emission or spontaneous fission, or any mixture for which either the identity or the concentration of any radionuclide in the mixture is not known. . . .		1E-15	2E-9	2E-8

Footnotes:

[a] *"Submersion" means that values given are for submersion in a hemispherical semi-infinite cloud of airborne material.*

Note:

1. If the identity of each radionuclide in the mixture is not known, but it is known that certain radionuclides specified in this section are not present in the mixture, the effluent and sewage concentrations for the mixture are the lowest values specified in this section for any radionuclide that is not known to be absent from the mixture; or

If it is known that Ac-227-D,W,Y, Th-229-W,Y, Th-232-W,Y, Pa-231-W,Y, Cm-248-W, and Cm-250-W are not present	1E-14	—	—
If, in addition, it is known that Sm-146-W, Gd-148-D,W, Gd-152-D, Th-228-W,Y, Th-230-W,Y, U-232-Y, U-233-Y, U-234-Y, U-235-Y, U-236-Y, U-238-Y, U-Nat-Y, Np-236-W, Np-237-W, Pu-236-W,Y, Pu-238-W,Y, Pu-239-W,Y, Pu-240-W,Y, Pu-242-W,Y, Pu-244-W,Y, Am-241-W, Am-242m-W, Am-243-W, Cm-243-W, Cm-244-W, Cm-245-W, Cm-246-W, Cm-247-W, Bk-247-W, Cf-249-W,Y, Cf-250-W,Y, Cf-251-W,Y, Cf-252-W,Y, and Cf-254-W,Y are not present	1E-13	—	—
If, in addition, it is known that Sm-147-W, Gd-152-W, Pb-210-D, Bi-210m-W, Po-210-D,W, Ra-223-W, Ra-225-W, Ra-226-W, Ac-225-D,W,Y, Th-227-W,Y, U-230-D,W,Y, U-232-D,W, U-Nat-W, Pu-241-W, Cm-240-W, Cm-242-W, Cf-248-W,Y, Es-254-W, Fm-257-W, and Md-258-W are not present	1E-12	—	—
If, in addition it is known that Fe-60, Sr-90, Cd-113m, Cd-113, In-115, I-129, Cs-134, Sm-145, Sm-147, Gd-148, Gd-152, Hg-194 (organic), Bi-210m, Ra-223, Ra-224, Ra-225, Ac-225, Th-228, Th-230, U-233, U-234, U-235, U-236, U-238, U-Nat, Cm-242, Cf-248, Es-254, Fm-257, and Md-258 are not present	—	1E-6	1E-5

2. If the identity and concentration of each radionuclide in a mixture are known, the limiting values should be derived as follows: determine, for each radionuclide in the mixture, the ratio between the concentration present in the mixture and the concentration otherwise established in Appendix A for the specific radionuclide when not in a mixture. The sum of such ratios for all of the radionuclides in the mixture may not exceed "1" (i.e., "unity").

Example: If radionuclides "A," "B," and "C" are present in concentrations C_A, C_B, and C_C, and if the applicable effluent concentrations (EC) are EC_A, EC_B, and EC_C, respectively, then the concentrations shall be limited so that the following relationship exists:

$$\frac{C_A}{EC_A} + \frac{C_B}{EC_B} + \frac{C_C}{EC_C} \leq 1$$

New Rule, R.2005 d.156, effective May 16, 2005.
See: 36 N.J.R. 2336(a), 37 N.J.R. 1826(a).

SUBCHAPTER 12. REMEDIATION STANDARDS FOR RADIOACTIVE MATERIALS

Authority

N.J.S.A. 26:2D–1 et seq. and 58:10B–1 et seq.

Source and Effective Date

R.2000 d.314, effective August 7, 2000.
See: 31 N.J.R. 1723(a), 32 N.J.R. 2866(a).

7:28–12.1 Purpose and scope

The purpose of this subchapter is to establish minimum standards for the remediation of real property contaminated by radioactive materials. This subchapter also provides direction on remediating a site contaminated with radioactive materials with regard to sampling, surveying, and laboratory requirements, remedial action selection, and remedial action requirements.

7:28–12.2 Applicability

(a) The standards in this subchapter are applicable to:

1. Remediation of radioactive contamination of real property by any technologically enhanced naturally occurring radioactive materials;

2. Remediation of radioactive contamination of real property by accelerator-produced radionuclides; and

3. Any other remediation of radioactive contamination including, without limitation, any remediation pursuant to: the Spill Compensation and Control Act, N.J.S.A. 58:10–23.11 et seq.; the Water Pollution Control Act; N.J.S.A. 58:10A–1 et seq.; the Industrial Site Recovery Act, N.J.S.A. 13:1K–6 et seq.; the Solid Waste Management Act, N.J.S.A. 13:1E–1 et seq.; the Comprehensive Regulated Medical Waste Management Act, N.J.S.A. 13:1E–48.1 et seq.; the Major Hazardous Waste Facilities Siting Act, N.J.S.A. 13:1E–49 et seq.; the Sanitary Landfill Facility Closure and Contingency Fund Act, N.J.S.A. 13:1E–100 et seq.; the Regional Low Level Radioactive Waste Disposal Facility Siting Act, N.J.S.A. 13:1E–177 et seq.; any law or regulation by which the State may compel a person to perform remediation activities; or N.J.A.C. 7:26C.

(b) The standards in this subchapter are not applicable to:

1. Materials containing naturally occurring radionuclides whose concentrations have not been technologically enhanced; or

2. Coal ash that has been or is being used in:

i. The manufacture of construction materials including, but not limited to, cinder blocks, concrete products and roofing materials;

ii. Road construction materials including, but not limited to, asphalt filler or road base material; or

iii. Landfill cover.

(c) The Department shall apply the radiation soil standards in this chapter at applicable sites as "Applicable or Relevant and Appropriate Requirements" as defined in the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§ 9601 et seq.

7:28–12.3 Definitions

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

"Appropriate period of time" means the length of time required for the radionuclide to decay seven half-lives.

"Committed dose equivalent" means the total dose equivalent averaged throughout any body tissue in the 50 years after intake of a radionuclide into the body.

"Committed effective dose equivalent" means the sum of the products of the committed dose equivalents to individual tissues resulting from an intake of a radionuclide multiplied by the appropriate weighting factor (W_T) indicated below:

Organ or Tissue	W_T
Gonads	0.25
Breast	0.15
Red bone marrow	0.12
Lung	0.12
Thyroid	0.03
Bone Surfaces	0.03
Remainder	0.30*
Whole Body (external)	1.00

*0.30 results from 0.06 for each of five "remainder" organs (excluding the skin and the lens of the eye) that receive the highest doses.

"Deep-dose equivalent" means, applied to external whole-body exposure, the dose equivalent at a tissue depth of one centimeter.

"Derived concentration guideline level" means the radionuclide-specific activity concentration corresponding to the release criterion.

"Design features" means those features of a remediation that do not rely on additional expenditures after installation to achieve their intended purpose.

"Dose equivalent" means the product of the absorbed dose (D), the quality factor (Q), and other modifying factors (N). For purposes of this definition, N = 1.

"Engineering controls" means any mechanism to contain or stabilize contamination or ensure the effectiveness of a remedial action. Engineering controls under this subchapter may include, without limitation, caps, covers, dikes, trenches, leachate collection systems, radon remediation systems, signs, fences and physical access controls.

"Final status survey" is a survey or analysis, performed after remediation, which provides data that demonstrates that all radiological parameters satisfy the remediation standards.

vii. An analysis of both continued use of existing structures and future use scenarios. Future use scenarios shall include, if applicable, the construction of buildings for either unrestricted use remedial actions or limited restricted use remedial actions, including excavations for basements and/or footings.

(g) Engineering controls or institutional controls may be incorporated as part of a petition for an alternative remediation standard provided that these controls will be durable and implemented for an appropriate period of time to achieve their intended purpose.

(h) Computer models acceptable to the Department may be used by the petitioner for an alternative soil standard to confirm that the requirements of N.J.A.C. 7:28–12.9 have been and will continue to be met.

7:28–12.11 Requirements pertaining to engineering or institutional controls

(a) All remediation proposals shall designate the intended use(s) of the property. Such intended use(s) shall be restricted as necessary to prevent future exposure, and shall otherwise be consistent with current and projected State and local zoning designations or land uses. For sites not remediated to the unrestricted use standards in N.J.A.C. 7:28–12.9, the Department shall define the nature and duration of all appropriate engineering or institutional controls necessary to meet the standards in N.J.A.C. 7:28–12.9 or 12.10(a), based upon the particular conditions of the site.

(b) In order for any remediation under this subchapter requiring engineering controls or institutional controls to meet the standards in N.J.A.C. 7:28–12.9 or 12.10(a), the person responsible for conducting the remediation shall, in addition to meeting the provisions of N.J.S.A. 58:10B–13:

1. Implement all necessary actions, as determined by the Department, to assure that such engineering or institutional controls are being implemented and maintained for an appropriate period of time; and

2. Provide for the costs of implementing and maintaining the requisite active engineered or institutional controls for an appropriate period of time.

7:28–12.12 Requirements pertaining to a change in land use

(a) Any subsequent proposed use of a property that is different from the intended use (other than unrestricted use remedial actions) described in the original remediation proposal shall require a prior review and prior approval by the Department. To initiate this review, 90 calendar days prior to a proposed change in land use, the person proposing such use shall prepare and submit to the Department, at the Bureau of Environmental Radiation, PO Box 415, Trenton, NJ 08625–0415, and to each affected municipality, a brief written description of the new proposed use as compared to the intended use upon which the original remediation was based including all planned soil excavations, and any additional remedial actions to be implemented.

(b) If the Department determines that the proposed new use may cause the dose limitations of N.J.A.C. 7:28–12.8 to be exceeded, the person requesting the use change shall be required to prepare and submit to the Department's Bureau of Environmental Radiation, PO Box 415, Trenton, NJ 08625–0415, a dose assessment analysis, containing the information required under N.J.A.C. 7:28–12.10(f)2, (g), and (h), to ascertain whether the dose limitation requirements of N.J.A.C. 7:28–12.8 will be met for the proposed new use.

(c) In preparing the dose assessment analysis, the person may incorporate into the new use plan new remedial measures such as different radionuclide in soil concentrations, or radioactive contamination vertical extents, and/or new engineering or institutional controls, provided that for engineering or institutional controls, the person responsible for conducting the remediation provides for the cost of implementing and maintaining them as specified in N.J.A.C. 7:28–12.11(c)3.

7:28–12.13 Requirements pertaining to the final status survey

The final status survey is performed to demonstrate that a site meets the remediation standards. It shall be done in accordance with that version of the Department of Environmental Protection's Field Sampling Manual's section on Radiological Assessment, which is incorporated herein by reference, in effect at the time of the survey which may be obtained by calling the Bureau of Environmental Radiation at (609) 984–5400 or from the Radiation Protection Program's web site at http://www.state.nj.us/dep/rpp/index.htm. Chapter 12 of the Department's Field Sampling Procedures Manual follows the methodology provided in MARSSIM with some modifications.

APPENDIX A

Allowed Incremental Derived Concentration Guideline Levels (pCi/g) for the Gamma and Intake Pathways[1]

Nuclide	Feet of Vertical Extent of Residual Radionuclides (VE)								
	VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8	VE9
Ra226 Unrestricted Use Standards	3	2	2	2	2	2	2	2	2

Ra226 Limited Restricted Use Standards		5	5	5	5	5	5	5	4	4

Allowed Incremental Derived Concentration Guideline Levels (pCi/g) for the Gamma and Intake Pathways(1)

Feet of Uncontaminated Surface Soil (USS)		Feet of Vertical Extent of Residual Radionuclide (VE)								
		VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8	VE9
Ra226 Restricted Use Standards	USS 1	22	15	10	8	6	5	5	4	4
	USS 2	28	15	10	8	6	5	5	5	5
	USS 3	28	15	10	8	6	6	6	6	6
	USS 4	28	15	10	8	7	7	7	7	7
	USS 5	28	15	10	9	9	9	9	9	9

Allowed Incremental Derived Concentration Guideline Levels (pCi/g) for the Gamma and Intake Pathways(1)

Nuclide	Feet of Vertical Extent of Residual Radionuclides (VE)								
	VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8	VE9
Ra226 Unrestricted Use Standards	0.13	0.09	0.09	0.09	0.09	0.09	0.09	0.08	0.08
Ra226 Limited Restricted Use Standards	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.15	0.15

Allowed Incremental Derived Concentration Guideline Levels (Bq/g) for the Gamma and Intake Pathways(1)

Feet of Uncontaminated Surface Soil (USS)		Feet of Vertical Extent of Residual Radionuclide (VE)								
		VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8	VE9
Ra226 Restricted Use Standards	USS 1	0.81	0.55	0.37	0.30	0.22	0.18	0.18	0.15	0.15
	USS 2	1.04	0.56	0.37	0.30	0.22	0.18	0.18	0.18	0.18
	USS 3	1.04	0.56	0.37	0.30	0.22	0.22	0.22	0.22	0.22
	USS 4	1.04	0.56	0.37	0.30	0.26	0.26	0.26	0.26	0.26
	USS 5	1.04	0.56	0.37	0.33	0.33	0.33	0.33	0.33	0.33

(1) These Ra226 concentration numbers may be used only when more than one radionuclide is present for the sum of the fractions rule at N.J.A.C. 7:28–12.9(b).

APPENDIX B

Allowed Incremental Derived Concentration Guideline Levels (pCi/g) for the Gamma and Intake Pathways(1)

Feet of Uncontaminated Surface Soil (USS)		Feet of Vertical Extent of Residual Radionuclide (VE)								
		VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8	VE9
Ra226 Unrestricted Use Pre-mixing Values	USS 1	5*	3*	3	3	3	3	2	2	2
	USS 2	7*	4*	4*	3*	3	3	2	2	2
	USS 3	7	5*	4*	4	3	3	3	3	3
	USS 4	11	7*	5*	4	3	3	3	3	3
	USS 5	13*	8	6	4	4	4	4	4	4
Ra226 Limited Restricted Use Pre-mixing Values	USS 1	11*	8*	7*	7*	6*	6*	5*	5*	5*
	USS 2	16*	11*	9*	8*	7*	6*	6*	5*	5*
	USS 3	21*	13*	10*	9*	7*	6*	6*	6*	6*
	USS 4	26*	16*	12*	9*	8*	7*	7*	6*	6*
	USS 5	31*	18*	11*	10*	9*	8*	7*	7*	7*

* Back-calculated to ensure 15 mrem/yr TEDE after mixing

Allowed Incremental Derived Concentration Guideline Levels (Bq/g) for the Gamma and Intake Pathways(1)

Feet of Uncontaminated Surface Soil (USS)		Feet of Vertical Extent of Residual Radionuclide (VE)								
		VE1	VE2	VE3	VE4	VE5	VE6	VE7	VE8	VE9
Ra226 Unrestricted	USS 1	0.18*	0.12*	0.12*	0.12*	0.12	0.10	0.09	0.08	0.08

Use	USS 2	0.25*	0.15*	0.15*	0.15*	0.12*	0.11	0.09	0.09	0.09
Pre-mixing	USS 3	0.25*	0.18*	0.17*	0.17	0.14	0.11	0.11	0.11	0.11
Values	USS 4	0.40*	0.25*	0.18*	0.17	0.13	0.13	0.13	0.13	0.13
	USS 5	0.48*	0.32	0.22	0.16	0.16	0.16	0.16	0.16	0.16
Ra226										
Limited	USS 1	0.40*	0.30*	0.26*	0.26*	0.22*	0.22*	0.18*	0.18*	0.18*
Restricted	USS 2	0.59*	0.40*	0.33*	0.30*	0.26*	0.22*	0.22*	0.18*	0.18*
Use	USS 3	0.77*	0.48*	0.37*	0.33*	0.26*	0.22*	0.22*	0.22*	0.22*
Pre-mixing	USS 4	0.96*	0.59*	0.44*	0.33*	0.30*	0.26*	0.26*	0.22*	0.22*
Values	USS 5	1.15*	0.67*	0.41*	0.37*	0.33*	0.30*	0.26*	0.26*	0.26*

* Back-calculated to ensure 15 mrem/yr TEDE after mixing

(1) These Ra226 concentration numbers may be used only when more than one radionuclide is present for the sum of the fractions rule at N.J.A.C. 7:28–12.9(b).

SUBCHAPTER 13. REPORTS OF THEFTS AND RADIATION INCIDENTS

7:28–13.1 Reports of theft or loss

A State licensee, radioactive materials registrant or registrant shall immediately notify the Department by telephone, telefax or telegraph of any theft or loss of any source of radiation including machine sources and any naturally occurring or accelerator produced radioactive material, including TENORM, in such quantities and under such circumstances that a substantial radiation hazard and/or contamination hazard may result.

Amended by R.2005 d.156, effective May 16, 2005.
See: 36 N.J.R. 2336(a), 37 N.J.R. 1826(a).
Rewrote the section.

7:28–13.2 Reportable radiation incidents

(a) A State licensee, radioactive materials registrant or registrant shall immediately notify the Department by telephone, telefax or 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 N.J.A.C. 7:28–11 Appendix, Table 1, 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) A State licensee, radioactive materials registrant or registrant shall notify the Department within 24 hours by telephone, telefax or 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 N.J.A.C. 7:28–11 Appendix, Table 1, 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) A State licensee, radioactive materials registrant or registrant 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 N.J.A.C. 7:28–6, or of a State 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 of N.J.A.C. 7:28–6 outside a controlled area in excess of 10 times the limits of N.J.A.C. 7:28–6.2 and 11 or of a State 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."

Amended by R.2005 d.156, effective May 16, 2005.
See: 36 N.J.R. 2336(a), 37 N.J.R. 1826(a).
Rewrote (a), (c), and (e).

SUBCHAPTER 14. THERAPEUTIC INSTALLATIONS

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;

ii. Filters cannot be accidentally displaced from the useful beam at any possible tube orientation;

iii. Each filter is marked as to its material of construction and its thickness or wedge angle for wedge filters;

iv. It shall be possible for the operator to determine the presence or absence of any filter in the useful beam when the operator is at the control panel, either by display at the control panel or by direct observation;

v. For equipment installed prior to October 1, 1987, the radiation at five centimeters from the filter insertion slot opening does not exceed 30 roentgens per hour under any operating conditions; and

vi. For equipment listed on or after October 1, 1987, the radiation from the filter slot shall not exceed the leakage radiation specified in (a)1 above.

4. A means shall be provided to immobilize the tube housing assembly during stationary treatments;

5. The tube housing assembly shall be so marked that it is possible to determine the location of the focal spot to within five millimeters, and such marking shall be readily accessible for use during calibration procedures;

6. Equipment employing Beryllium or other low-filtration windows shall have a removable shield of at least 0.5 millimeter lead equivalency at 100 kVp that can be positioned over the entire useful beam exit port during periods when the beam is not in use;

7. Radiotherapy systems of greater than 150 kVp installed on or after October 1, 1987 shall be provided with a beam monitor system which shall:

i. Include a radiation detector which is placed on the patient side of any fixed added filters other than a wedge filter;

ii. Have the radiation detector interlocked to prevent its incorrect positioning in the useful beam;

iii. Not allow irradiation until a pre-selected value of exposure or pre-selected number of dose monitor units has been made at the treatment control panel;

iv. Independently terminate irradiation when the pre-selected value of exposure or dose monitor units has been reached;

v. Be so designed that, in the event of a system malfunction or electrical power failure, the dose administered to a patient prior to the system malfunction or power failure can be accurately determined;

vi. Have a display at the control panel, reading in roentgens, or coulombs per kilogram from which the dose at a reference point in the treatment volume can be calculated;

(1) The reading shall be maintained in the display at the control panel until intentionally reset to zero; and

vii. Have a control panel display which does not have scale multiplying factors and utilizes a design such that an increasing dose is displayed by increasing numbers.

8. The following are the equipment requirements for timer systems:

i. A timer system shall be provided which has a display at the treatment control panel. It shall be graduated in minutes and seconds and/or fractions of minutes. It shall have a pre-set time selector. For equipment installed on or after October 1, 1987, it shall also have an elapsed time indicator;

ii. The timer shall terminate irradiation when a preselected time has elapsed;

iii. The timer shall permit pre-setting and determination of exposure times to an accuracy of one second or less;

iv. The timer shall not permit an exposure if set at zero;

v. When patient irradiation is controlled by a shutter mechanism the timer shall not begin to run until the shutter is opened;

vi. Equipment installed on or after October 1, 1987 shall have an elapsed-time indicator which is activated when radiation is emitted and retains its reading after irradiation is interrupted or terminated; and

vii. After irradiation is terminated and before irradiation can be reinitiated, it shall be necessary to cycle the pre-set time selector through zero time.

9. In addition to the control panel displays required in other provisions of this subsection, the control panel shall have:

i. An indication of whether electrical power is available at the control panel and if activation of the x-ray tube is possible;

ii. An indication of whether x-rays are being produced;

iii. Means for indicating kVp and x-ray tube current; and

iv. The means for terminating an exposure at any time.

10. There shall be a means of determining the source-to-patient distance to within 10 percent or one centimeter, whichever is smaller; and

11. Unless it is possible to bring the x-ray output to the prescribed exposure parameters within five seconds, the entire useful beam shall be attenuated automatically

by a shutter having a lead equivalency not less than that of the tube housing assembly. In addition:

i. After the unit is at operating parameters, the shutter shall be controlled electrically from the control panel by the operator; and

ii. An indication of shutter position shall appear at the control panel.

(b) In addition to shielding adequate to meet the requirements of N.J.A.C. 7:28–5 and 6, the treatment room design and shielding requirements for systems capable of operating above 50 kVp, shall be the following:

1. There shall be warning lights in treatment rooms to which access is possible through more than one entrance. The warning lights shall be placed in readily observable positions near the outside of all access doors and shall indicate when the useful beam is "on";

2. There shall be means for two-way aural communication between the patient and the operator at the control panel at all times when the system is in operation;

3. A window, mirror, closed-circuit television, or an equivalent system shall be provided to permit continuous observation of the patient during irradiation and shall be so located that the operator can observe the patient from the control panel. When the primary viewing system is by electronic means (for example, television), a secondary viewing system shall be available for use in the event of failure of the primary viewing system;

4. Treatment rooms which contain an x-ray system capable of operating above 150 kVp shall meet the following additional requirements:

i. All required shielding, except for any beam interceptor, shall be provided by fixed barriers;

ii. The control panel shall be outside the treatment room;

iii. All entrance doors of the treatment room shall be electrically connected to the control panel in such a way that x-ray production cannot occur unless all doors are closed;

iv. When any entrance door of the treatment room is opened while the x-ray tube is activated, x-ray production shall terminate within one second; and

v. After the radiation output of the x-ray tube has been terminated by the opening of any door of the treatment room, it shall be possible to restore the x-ray system to full operation only upon closing the door, and subsequently, reinitiating the exposure at the control panel.

(c) The following are the calibration requirements for therapeutic x-ray systems with energies less than one MeV:

1. System calibrations 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 significantly alter the calibration or other characteristic of the therapy beam;

2. The calibration of the radiation output of the x-ray system shall be performed by a qualified radiological physicist;

3. Calibration of the radiation output of an x-ray system shall be performed with an instrument whose calibration shall be directly traceable to a national standard and which shall have been calibrated within the preceding three years;

4. The calibration shall be such that the dose at a reference point in soft tissue can be calculated to within ± 5 percent;

5. The calibration of the x-ray system shall include, but not be limited to, the following determinations;

i. Verification that the x-ray system is operating in compliance with the radiological design specifications;

ii. The exposure rates for each combination of field size, technique factors, filter, and treatment distance used;

iii. The congruence between the radiation field and the field indicated by the localizing device if such device is present; and

iv. The uniformity of the radiation field symmetry for representative field sizes used.

6. Records of 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.

(d) Spot checks shall be performed on therapeutic x-ray systems with energies greater than 0.018 MeV and less than one MeV and shall meet the following requirements:

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 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. 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;

4. 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; and

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

(e) The following procedures shall be followed when operating therapeutic x-ray systems with energies less than one MeV:

1. A therapeutic x-ray system 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 unless such individual is protected by a barrier meeting the requirements of N.J.A.C. 7:28–6. No individual other than the patient shall be in the treatment room during exposure when the kVp exceeds 50;

3. When a patient must be held in position for radiation therapy, mechanical supporting or restraining devices shall be used; and

4. Except for contact therapy devices, the tube housing assembly shall not be held by an individual during exposure.

(f) The x-ray system shall not be used in the administration of radiation therapy unless the requirements of this section have been met.

Correction: Therapeutic x-ray systems with energies less than one MeV for 0–150 kVp systems which are installed prior to October instead of January.
See: 19 N.J.R. 1917(c).

7:28–14.4 Therapeutic x-ray and therapeutic accelerator installations with energies of one MeV and above

(a) The following are the equipment requirements related to leakage radiation to the patient area:

1. Leakage radiation shall be measured under conditions producing maximum leakage radiation and shall be reported as absorbed dose in rads or grays in water. For equipment installed on or after October 1, 1987, measurements shall include x-rays, electrons and neutrons. For equipment incapable of operating at energies greater than 10 MeV, measurements shall exclude neutrons. For equipment installed before October 1, 1987, measurements shall exclude neutrons. The leakage radiation shall be measured in a plane perpendicular to the central axis of the beam located at the normal treatment distance or passing through the isocenter. The leakage radiation at any point on this plane outside the useful beam but within two meters of the central axis of the beam shall not exceed 0.1 percent of the maximum radiation of the useful beam, measured at the point of intersection of the central axis and the plane;

2. Measurements for leakage radiation shall be averaged over an area up to, but not exceeding, 100 square centimeters at the positions specified. For equipment installed on or after October 1, 1987, measurements of the portion of the leakage radiation dose contributed by neutrons shall be averaged over an area up to, but not exceeding, 400 square centimeters. For equipment incapable of operating at energies greater than 10 MeV, measurements shall exclude neutrons. For equipment installed before October 1, 1987, measurements shall exclude neutrons;

3. For each system the registrant shall determine, or obtain from the manufacturer, the amount of leakage radiation at the positions specified in 1 above. Records of leakage radiation shall be maintained at the facility for inspection by the Department.

(b) The following are the equipment requirements for leakage radiation outside the patient area:

1. Except in the area specified in (a) above as the patient area, the x-ray leakage measured as absorbed dose in rads or grays in water, at any location averaged over 100 square centimeters one meter from the path of the charged particles before they strike the target or the window, shall not exceed 0.1 percent of the maximum absorbed dose in the circular plane specified in (a) above;

2. Except in the area specified in (a) above as the patient area, neutron leakage measured as absorbed dose in rads or grays in water, at any point one meter from the path of the charged particles before they strike the target or the window, shall not exceed 0.05 percent of the maximum absorbed dose in the circular plane specified in (a) above;

3. The registrant shall determine, or obtain from the manufacturer, the actual leakage radiation existing at the positions specified in 1 and 2 above for specified operating conditions. Radiation measurements excluding neutrons shall be averaged over an area up to, but not exceeding, 100 square centimeters at the positions specified. For equipment installed on or after October 1, 1987, neutron measurement shall be averaged over an area up to, but not exceeding, 400 square centimeters. For equipment incapable of operating at energies greater than 10 MeV, measurements shall include neutrons. For

equipment installed prior to October 1, 1987, measurement of neutrons shall be excluded.

(c) The following are the equipment requirements for beam limiting devices:

1. For equipment installed on or after October 1, 1987, adjustable or interchangeable beam limiting devices shall be provided and such devices shall transmit no more than one percent of the useful beam at the normal treatment distance for the portion of the useful beam which is to be attenuated by the beam limiting device. The neutron component of the useful beam shall not be included in this requirement; and

2. For equipment installed prior to October 1, 1987, the beam limiting device shall meet the requirements of (a)1 above except that such device shall transmit no more than two percent of the useful beam.

(d) The following are the equipment requirements for filters:

1. If the absorbed dose rate information required by (p) below relates exclusively to operation with a field flattening or beam scattering filter in place, such filter shall be removable only by the use of tools;

2. In systems installed on or after October 1, 1987, which utilize a system of wedge filters, interchangeable field flattening filters or interchangeable beam scattering filters:

i. Irradiation shall not be possible until a selection of a filter has been made at the treatment control panel;

ii. An interlock system shall be provided to prevent irradiation if the filter selected is not in the correct position;

iii. A display shall be provided at the treatment control panel showing the filter in use;

iv. Each filter which is removable from the system without the use of tools shall be clearly marked with an identification number and accompanying documents shall contain a corresponding drawing or other description of the filter, showing dimensions and materials. The identification number shall appear on the wedge filter as well as on its tray. The identification number shall be referable to wedge angle and wedge factor; and

v. An interlock shall be provided to prevent irradiation if any filter selection operation carried out in the treatment room does not agree with the filter selection operation carried out at the treatment control panel.

3. The only filter requirement for equipment installed prior to October 1, 1987 shall be that required by (d)2iv above.

(e) Beam quality data sufficient to assure that the following beam quality requirements are met shall be determined or obtained from the manufacturer by the registrant:

1. For radiotherapy systems capable of electron beam therapy the absorbed dose in water resulting from x-rays in a useful electron beam shall be determined at a point on the central axis of the beam 10 centimeters greater than the practical range of the electrons. This shall not exceed the values stated in the following table. Linear interpolation shall be used for values not stated;

TABLE

Maximum Energy of Electron Beam in MeV	X–Ray absorbed Dose as a Fraction of Maximum Absorbed Dose
1	0.03
15	0.05
35	0.10
50	0.20

2. Compliance with 1 above shall be determined using:

i. A measurement within a phantom with the incident surface of the phantom at the normal treatment distance and normal to the central axis of the beam;

ii. The largest field size available which does not exceed 15 centimeters by 15 centimeters; and

iii. A phantom whose cross-sectional dimensions exceed the measurement radiation field by at least five centimeters and whose depth is sufficient to perform the required measurement.

3. The absorbed dose at a surface located at the normal treatment distance, at the point of intersection of that surface with the central axis of the useful beam during x-ray irradiation, shall be measured at intervals not to exceed 12 months and the results of such measurements shall be maintained with the records of calibration;

4. The measurements required by (e)3 above shall conform to the following requirements:

i. Measurements shall be made within a phantom using an instrument which will allow extrapolation to the surface absorbed dose;

ii. Measurements shall be made using a phantom whose size and placement meet the requirements of 2iii above;

iii. Measurements shall be made after removal of all beam modifying devices which can be removed without the use of tools, except for beam scattering or beam flattening filters; and

iv. Measurements shall be made over the range of field sizes clinically used.

2. Has received copies of and instruction in the applicable sections of this Chapter and the owner's operating and emergency procedures required pursuant to (d) below, and demonstrated an understanding of this Chapter and the procedures specified therein; and

3. Has demonstrated competence to use the ionizing radiation-producing machines, radiographic-exposure devices, sealed sources, related handling tools and survey instruments which will be employed in his assignment.

(b) The outline of the course for radiographer's training is as follows:

1. Fundamentals of radiation safety:

i. Characteristics of gamma and x-radiation;

ii. Units of radiation dose and quantity of radioactivity;

iii. Hazards of excessive exposure to radiation;

iv. Levels of radiation from ionizing radiation-producing machines and radioactive materials;

v. Methods of controlling radiation dose:

(1) Working time;

(2) Working distances;

(3) Shielding.

2. Radiation detection instrumentation to be used:

i. Use of ionizing radiation survey instruments:

(1) Operation;

(2) Calibration;

(3) Limitations.

ii. Survey techniques;

iii. Use of personnel-monitoring equipment:

(1) Film badges;

(2) Pocket dosimeters;

(3) Pocket chambers;

3. Radiographic equipment to be used:

i. Ionizing radiation-producing machines;

ii. Radiographic-exposure devices;

iii. Storage containers;

iv. Remote handling equipment.

4. The requirements of pertinent Federal and State regulations;

5. The owner's written operating and emergency procedures.

(c) The owner shall not permit any person to act as a radiographer's assistant until such person:

1. Has received copies of and instruction in the owner's operating and emergency procedures, required pursuant to (d) below, and has demonstrated an understanding of the procedures; and

2. Has demonstrated competence to use under the personal supervision of the radiographer the ionizing radiation-producing machines, radiographic-exposure devices, sealed sources, related handling tools and radiation-survey instruments which will be employed in his assignment; and

3. Has been instructed by a qualified individual in the subjects outlined in (b) above, and has demonstrated an understanding of those subjects by written examination given by a qualified individual.

(d) The owner shall prepare written operating and emergency procedures which shall include instructions in at least the following:

1. The handling and the use of ionzing radiation-producing machines, sealed sources and radiographic-exposure devices to be employed such that no person is likely to be exposed to radiation doses in excess of the limits established in N.J.A.C. 7:28–6;

2. Methods and occasions for conducting radiation surveys;

3. Methods for controlling access to radiographic areas;

4. Methods and occasions for locking and securing ionizing radiation-producing machines, radiographic-exposure devices, storage containers and sealed sources;

5. Personnel monitoring and the use of personnel-monitoring equipment;

6. Transporting sealed sources to field locations, including packing of radiographic-exposure devices and storage containers in the vehicles, posting of vehicles, and control of the sealed sources during transportation;

7. Minimizing exposure of persons in the event of an accident;

8. The procedure for notifying proper persons in the event of an accident; and

9. Maintenance of records.

(e) The owner shall not permit any person to act as a radiographer or as a radiographer's assistant unless the owner has supplied to each such person and requires that each such person shall wear a film badge and either a pocket dosimeter or pocket chamber. The requirement for use of film badges, pocket dosimeters, and pocket chambers are as follows:

1. Pocket dosimeters and pocket chambers shall be capable of measuring doses from zero to at least 200 milliroentgens.

2. Pocket dosimeters and pocket chambers shall be read and doses recorded daily.

3. A film badge will be assigned to and worn by only one person.

4. A film badge shall be immediately processed if a pocket chamber or pocket dosimeter is discharged beyond its range.

5. The film badge reports received from the film badge processor and records of pocket dosimeter and pocket chamber readings shall be maintained for inspection by the Department.

Amended by R.1985 d.502, effective October 7, 1985.
See: 17 N.J.R. 1626(a), 17 N.J.R. 2389(a).
Recodified from 17.4 with substantive changes.

7:28–17.6 Precautionary procedures in radiographic operations

(a) During each radiographic operation the radiographer or radiographer's assistant shall maintain a direct surveillance of the operation to protect against unauthorized entry into a high radiation area, except as follows:

1. Where the high radiation area is equipped with a control device which shall either cause the level of radiation to be reduced below that at which an individual might receive a dose of 100 millirems in one hour upon entry into the area, or shall energize a conspicuous visible and audible alarm signal in such a manner that the individual entering and the owner or the supervisor of the activity are made aware of the entry; or

2. Where the high radiation area is locked to protect against unauthorized or accidental entry.

(b) Notwithstanding any provisions in N.J.A.C. 7:28–10.8, areas in which radiography is being performed shall be conspicuously posted as required by N.J.A.C. 7:28–10.2 and 7:28–10.3.

(c) No radiographic operation shall be conducted unless calibrated and operable ionizing radiation-survey instrumentation as described in N.J.A.C. 7:28–17.4(e) is available and used at each site where radiographic exposures are made.

(d) In addition to the requirements of N.J.A.C. 7:28–7, no radiographic operation shall be conducted unless the owner ensures that radiation surveys are made and recorded as follows:

1. Physical radiation surveys shall be made as necessary during radiographic exposures to determine compliance with N.J.A.C. 7:28–6.

2. A physical radiation survey shall be made after each radiographic exposure employing a sealed source to determine that the sealed source has been returned to its shielded condition.

3. After radiographic operations employing a sealed source or sources have been completed, a physical radiation survey shall be made to determine that each sealed source is in its shielded condition prior to securing the radiographic-exposure device and storage container as specified in N.J.A.C. 7:28–17.4(a) and (c).

4. Clear and legible records shall be kept of the surveys that are required by (d)1 and 3 above and maintained for inspection by the Department.

Amended by R.1985 d.502, effective October 7, 1985.
See: 17 N.J.R. 1626(a), 17 N.J.R. 2389(a).
Recodified from 17.5 with substantive changes.
Amended by R.2004 d.44, effective January 20, 2004.
See: 35 N.J.R. 2008(a), 36 N.J.R. 445(a).
Inserted new (d).

7:28–17.7 Cabinet x-rays systems

(a) No person shall operate or permit the operation of a cabinet x-ray system unless such system meets the requirement of N.J.A.C. 7:28–17.1, 7:28–17.2, 7:28–17.3, and 7:28–17.7.

(b) No person shall operate or permit any other person to operate a cabinet x-ray system until the operator has received a copy of the operator's manual, has been trained in the operating procedures for the system, and has demonstrated competence in operating the system. The owner shall maintain a copy of the operator's manual in the proximity of the system.

(c) Each owner shall supply appropriate personnel monitoring equipment to and shall require that it be used by every individual who operates, makes "set-ups", or performs maintenance on a cabinet radiography unit.

(d) Radiation emitted from the cabinet x-ray system shall not exceed an exposure of 0.5 milliroentgen in one hour at any point five centimeters outside the external surface.

(e) No cabinet x-ray system shall be placed into operation until a radiation survey is made by a qualified individual demonstrating that the exposure level in (d) above is not exceeded. Where an operating system is subsequently modified, repaired or moved to a new location an additional survey shall be performed, and operation shall not resume until a survey demonstrates compliance with this limit. The owner shall perform such additional surveys as required by the Department or as determined by a qualified individual. The owner shall maintain a record of all surveys performed and shall make such records available to the Department for inspection.

(f) Safety interlocks shall be provided on cabinet x-ray systems as follows:

1. Each door of a cabinet x-ray system shall have a minimum of two safety interlocks installed in such a manner that the opening of any door would disconnect the energy supply circuit to the high-voltage generator.

2. Each access panel on a cabinet x-ray system shall have at least one safety interlock.

3. Following interruption of x-ray generation by the functioning of any safety interlock, a manually reset control button shall be activated before x-ray generation can resume.

4. Failure of any single component of the cabinet x-ray system shall not cause failure of more than one required safety interlock.

5. Safety interlocks shall be tested for operation at intervals not to exceed six months. A record of these tests shall be maintained for inspection by the Department.

(g) A cabinet x-ray system shall have a permanent floor. Any support surface to which a cabinet x-ray system is permanently affixed may be deemed the floor of the system.

(h) Warning labels shall be provided on cabinet x-ray systems and shall meet the following requirements:

1. There shall be permanently affixed or inscribed on the cabinet x-ray system at the location of any controls which can be used to initiate x-ray generation a clearly legible and visible label bearing the statement or words having a similar meaning: "CAUTION: X–RAYS PRODUCED WHEN ENERGIZED"; and

2. There shall be permanently affixed or inscribed on the cabinet x-ray system adjacent to each port a clearly legible and visible label bearing the statement or words having a similar meaning: "CAUTION: DO NOT INSERT ANY PART OF THE BODY WHEN SYSTEM IS ENERGIZED: X–RAY HAZARD".

(i) All cabinet x-ray systems shall be provided with the following controls and indicators:

1. A key-actuated control to insure that x-ray generation is not possible with the key removed;

2. A control button or control switch to initiate and terminate the generation of x-rays other than by the functioning of a safety interlock or the main power control;

3. A warning light at the control button or control switch that indicates when and only when x-rays are being generated. This light shall be clearly labeled with the words: "X–RAY ON";

4. A warning light which indicates when and only when x-rays are being generated. This warning light shall be visible from each door, access panel, and port and shall be clearly labeled with words: "X–RAY ON".

5. A meter which indicates the kilovoltage and current during the generation of x-rays at each x-ray control button or control switch unless the x-ray tube current is preset.

(j) Cabinet x-ray systems designed primarily for the inspection of carry-on baggage at airline, railroad, and bus terminals, and similar facilities, shall be provided with means to insure that an operator is present at the control area in a position which permits surveillance of the ports and doors during the generation of x-radiation as follows:

1. During an exposure or preset succession of exposures of one-half second or greater duration, the system shall contain a mechanism to enable the operator to terminate the exposure or preset succession of exposures at any time.

2. During an exposure or preset succession of exposures of less than one-half second duration, there shall be a mechanism provided to allow completion of the exposure in progress but shall enable the operator to prevent additional exposures.

New Rule, R.1985 d.502, effective October 7, 1985.
See: 17 N.J.R. 1626(a), 17 N.J.R. 2389(a).

7:28–17.8 Shielded room radiography

(a) No person shall operate or permit the operation of any ionizing radiation-producing machine, radiographic-exposure device, or sealed source used in shielded room radiography unless the equipment, installation, and personnel meet the requirements of N.J.A.C. 7:28–17.1 through 7:28–17.6 and 7:28–17.8.

(b) No person shall operate or permit any person to operate an ionizing radiation-producing machine, radiographic-exposure device, or sealed source used in shielded room radiography until such operator has completed the following requirements:

1. The operator has met the requirements of N.J.A.C. 7:28–17.5;

2. The operator has received a copy of and instruction in N.J.A.C. 7:28–1 through 7:28–13 and 7:28–17 and a copy of the owner's operating and emergency procedures as required by N.J.A.C. 7:28–17.5(d) and has demonstrated an understanding of the procedures and regulations by written examination given by a qualified individual; and

3. The operator has demonstrated competence to operate appropriate safety systems.

(c) Each owner shall supply appropriate personnel monitoring equipment and shall require that it be used by every individual who operates, makes "set-ups," or performs maintenance on an ionizing radiation-producing machine, radiographic-exposure device, or sealed source used in shielded room radiography.

(d) The enclosed room in which shielded room radiography is conducted shall be shielded so that no location on the exterior exceeds the radiation levels and limits established in N.J.A.C. 7:28–6. No industrial radiography shall be conducted in a shielded room until a radiation survey is first made to insure compliance with these radiation levels and limits. A record of this survey shall be maintained and a copy shall be available for inspection by the Department.

(e) No person shall enter an enclosed room in which shielded room radiography is performed until after a physical radiation survey is conducted to determine whether the ionizing radiation producing machine is off or the radiographic-exposure device or the sealed source is in the shielded or "off" position. A record shall be maintained of the date and exposure rate measured for each physical radiation survey and shall be made available for inspection by the Department.

(f) The radiation surveys required in (d) and (e) above shall be made with a radiation survey instrument measuring radiation at the energies and at the exposure rates to be encountered. This instrument shall have an operational check source test conducted prior to each use and shall be calibrated at intervals not to exceed one year and shall be recalibrated after each servicing other than a battery replacement. Records shall be maintained of each date of calibration and the daily operational check and shall be made available for inspection by the Department.

(g) Adequate methods shall be provided to restrict the access of personnel and the public to any and all shielded room radiography areas to prevent the exposure of any person to radiation in excess of the level limits of N.J.A.C. 7:28–5, 7:28–6 and 7:28–17. No person is permitted to remain within the enclosed room where shielded room radiography is being performed.

(h) All ionizing radiation-producing machines, radiographic-exposure devices, and sealed sources used in shielded room radiography and all objects exposed thereto shall be confined within an installation or structure designed or intended for radiography and in which radiography is regularly performed in accordance with the following requirements:

1. A reliable interlock or other mechanism shall be installed at each means of access to the shielded room which will turn off the source(s) of radiation if a person tries to enter or open the door to the shielded room.

2. A door-fastening mechanism shall be installed so that the door to the shielded room can be opened from the inside at all times in case of emergency.

3. A visible and audible signal alarm system shall be installed within the shielded room which will be actuated at a reasonable length of time before the power to the radiation source can be activated which enables persons in the vicinity of the shielded room to take appropriate protective actions.

4. One or more scram or emergency buttons shall be installed at a highly visible and easily accessible location or locations within the shielded room that will terminate the power to the source of radiation. This scram or emergency button shall be installed so that it shall require manual resetting before the power to the source of radiation can be reactivated.

5. Each source of radiation used in shielded room radiography shall be provided with a lock at the control panel to prevent unauthorized use of the source.

6. If more than one source of radiation is used in the same shielded room, all such sources of radiation shall meet the requirements of 1–5 above.

New Rule, R.1985 d.502, effective October 7, 1985.
See: 17 N.J.R. 1626(a), 17 N.J.R. 2389(a).

SUBCHAPTER 18. MAJOR NUCLEAR FACILITIES

7:28–18.1 Scope

(a) The special requirements of this Subchapter shall apply to major nuclear facilities including nuclear reactors, nuclear fuel fabrication plants, nuclear fuel reprocessing plants, and nuclear waste handling or disposal facilities.

(b) These requirements are in addition to the requirements of other applicable Sections of this Chapter.

(c) The intent of this Section is to insure that individuals outside of these facilities receive no radiation exposures from environmental or direct radiation that are in excess of the limits of Sections 6.1 (Exposure of individuals in controlled areas) and 6.2 (Radiation levels outside controlled areas) of this Chapter.

7:28–18.2 Facility description and required monitoring program

(a) Any person desiring to construct a major nuclear facility within this State shall submit a general description of the proposed facility with a discussion of probable and maximum potential radioactive discharges. This description shall be submitted to the Department for evaluation, as early as possible, but not less than six months prior to the start of construction, and shall include the following:

1. A general description of the proposed facility;

2. The nature of and the proposed rates of discharge of radioactive contaminants to the environment and/or the nature of and amounts of radioactive materials subject to temporary or permanent storage;

3. The proposed methods of limiting the discharge of radioactive contaminants to the atmosphere;

4. The proposed methods of limiting the discharge of radioactive contaminants to ground or surface waters;

5. The proposed methods of disposal of radioactive or radioactively contaminated materials; and

6. Preliminary description of the proposed radiological monitoring program.

(b) As used in this section, the term "construction" includes pouring the foundation for, or the installation of, any portion of the permanent facility on the site, but does not include the following:

1. Site exploration, site excavation, preparation of the site for construction of the facility, including the driving of piles, and construction of roadways, railroad spurs, and transmission lines;

2. Procurement or manufacture of components of the facility; or

3. Construction of non-nuclear facilities (such as construction equipment storage sheds) for use in connection with the construction of the facility.

(c) Any person desiring to operate a major nuclear facility within this State shall develop an adequate program of radiological monitoring consistent with the hazard from actual or potential discharges. The proposed program shall be submitted to the Department for evaluation as to its adequacy as early as possible but at least six months prior to the start of operation. The proposed radiological monitoring program shall include revised statements of the information required in (a) and (b) above, and it shall also include:

(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
PO Box 402
Trenton, New Jersey 08625–0402

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

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.

7:28–20.4 General requirements for a particle accelerator facility

(a) Particle accelerators not capable of operating at more than 30 kVp shall be exempt from the requirements of (b) through (f) below and N.J.A.C. 7:28–20.5 through 20.12 provided that the initial or repeat radiation protection survey does not yield radiation levels greater than 0.5 millirem per hour using maximum operating conditions of operation as measured five centimeters from any accessible surface.

(b) A registrant shall not permit a particle accelerator to be operated unless the person operating the particle accelerator has met the requirements of N.J.A.C. 7:28–20.6(a).

(c) A registrant shall not use a particle accelerator or cause it to be used unless the equipment, facilities, operating procedures and emergency procedures are adequate to minimize danger to property and to public health and safety.

(d) The registrant of a particle accelerator facility shall appoint a Particle Accelerator Safety Officer (PASO) who is authorized to act on behalf of the registrant to implement and maintain a radiation safety program for the particle accelerator facility. The PASO may be either a full-time employee of the registrant or a consultant hired by the registrant. The registrant shall hold the final responsibility for the safe operation of the facility in accordance with all pertinent provisions of this chapter.

(e) A particle accelerator safety officer shall meet at least one of the following five criteria:

1. Certification in health physics by the American Board of Health Physics or certification in therapy physics and/or radiological physics by the American Board of Radiology;

2. A bachelor's degree from an accredited college in biology, chemistry, radiation sciences, physics, engineering or mathematics and six years of professional technical experience in the field of radiological health or in a radiation protection activity. At least one year of the required health physics experience shall have been with a particle accelerator of a type similar to that with which the PASO will be working;

3. A master's degree in radiological health, radiation sciences, physics, chemistry, environmental sciences, engineering or a related field and at least five years of professional technical experience in the field of radiological health or in a radiation protection activity. At least one year of the required health physics experience shall have been with a particle accelerator of a type similar to that with which the PASO will be working;

4. A doctorate degree in radiological health, radiation sciences, physics, chemistry, environmental sciences, engineering or a related field plus four years of professional technical experience in the field of radiological health or in a radiation protection activity. At least one year of the required health physics experience shall have been with a particle accelerator of a type similar to that with which the PASO will be working; or

5. Ten years of professional technical experience in the field of radiological health or in a radiation protection activity. At least five years of the required health physics experience shall have been with a particle accelerator of a type similar to that with which the PASO will be working.

(f) A particle accelerator safety officer in a facility where the particle accelerators are only electron microscopes shall comply with the requirements set forth in (e) above or shall have received a bachelor's degree from an accredited college in a biological or physical science and shall have passed at least one course in radiation safety offered by an accredited college.

(g) The registrant of a particle accelerator shall appoint a radiation protection committee whose approval shall be required for implementation of procedures for the use of each particle accelerator. The PASO shall be a member of this committee.

7:28–20.5 Use of particle accelerators on humans

(a) A registrant shall not use a particle accelerator or cause it to be used for the intentional irradiation of humans without first sending to the Department a written request stating the registrant's reasons for this use of the particle accelerator and the manner in which it will be used, and obtaining written approval from the Department.

(b) A registrant shall not use a particle accelerator or cause it to be used for the intentional irradiation of humans unless the equipment meets the requirements of this subchapter and N.J.A.C. 7:28–14.

7:28–20.6 Training program on the safe use of each particle accelerator

(a) The registrant shall establish and maintain a training program on the safe use of each particle accelerator. The registrant shall not permit any person to operate the particle accelerator until that person has successfully completed the training program consisting of the 10 items set out below. The registrant shall ensure that the training program is conducted under the direction of the PASO or an individual with equivalent qualifications in conjunction with the qualified machine operator and that the program shall include all of the following:

1. Instruction in the types, characteristics, location, and levels of radiation produced by the particle accelerator;

2. Instruction in the units of radiation exposure, dose, dose equivalent, and quantity of radioactivity associated with the particle accelerator;

3. Instruction in the biological effects of ionizing radiation;

4. Instruction in the methods used to prevent radiation exposure at the particle accelerator facility, including, but not limited to, time, distance, shielding, interlock system, safety procedures and radiation monitoring equipment;

5. Instruction in the use and care of personnel monitoring equipment employed at the particle accelerator facility;

6. Instruction on the location and use of all operating controls for the particle accelerator;

7. Instruction on the requirements of this subchapter and N.J.A.C. 7:28–1 through 11 and 13;

8. Instruction in the facility's written operating and emergency procedures;

9. An examination testing the operator's knowledge of the requirements of (a)1 through 8 above. The examination shall be of sufficient depth to demonstrate that the operator has received instruction in each of the items listed above and has an understanding of the items at a level which permits the operator to use the particle accelerator in a manner consistent with the overriding goal of minimizing danger to public health and safety; and

10. At least 100 documented hours of on-the-job training under the direct supervision of a qualified machine operator and certified in writing by the PASO. The registrant shall maintain this documentation and certification for five years at the particle accelerator facility. These records shall be produced for review by the Department during an inspection and shall be submitted to the Department upon request. If, in the opinion of the PASO, the requirement of 100 hours of on-the-job training is too stringent for a particular particle accelerator, then the PASO shall submit a report documenting the number of hours of on-the-job training needed to become a qualified operator to the Department for approval.

(b) The registrant shall require each operator to become requalified not less than once every three years by completing a refresher training course covering the requirements of (a)1 through 9 above. The registrant shall maintain a record of each individual's completion of the refresher training course for five years at the particle accelerator facility. These records shall be produced for review by the Department during an inspection and shall be submitted to the Department upon request.

(c) A registrant may permit a person to function as an operator's assistant under the direct supervision of a qualified machine operator until that person has completed a training course covering the requirements of (a)1 through 10 above.

(d) The registrant shall maintain records of the operator's training program, including a copy of the examination, for at least five years at the particle accelerator facility. These records shall be produced for review by the Department during an inspection and shall be submitted to the Department upon request.

(e) Prior to operation of any particle accelerator after February 3, 1992, the registrant shall document in writing the name of each individual who operated a particle accelerator prior to February 3, 1992 and whom the PASO and the Radiation Protection Committee have certified as the first qualified machine operator for each particle accelerator. The registrant shall maintain this documentation for five years at the particle accelerator facility and shall produce it for review by the Department during an inspection. After February 3, 1992, an individual is required to complete all items in (a) above in order to become a qualified machine operator.

(f) When a new particle accelerator facility commences operation or places into operation a newly invented particle accelerator, the PASO and the Radiation Protection Committee shall document in writing the name and qualifications of the individual whom they have certified as the first qualified machine operator. Any subsequent machine operator shall be subject to the provisions of (a) above.

7:28–20.7 Shielding design and radiation area survey requirements for a particle accelerator

(a) A person shall consult with an individual with qualifications equivalent to those specified in N.J.A.C. 7:28–20.4(e) with respect to the health physics considerations in the design of a particle accelerator installation. The original record of this consultation, including the shielding design, shall be maintained at the particle accelerator facility for the life of the unit and shall be produced for review by the Department during an inspection and a copy submitted to the Department along with the registration form. This section shall apply to those particle accelerators planned for installation after February 3, 1992.

(b) A registrant shall not install a particle accelerator unless such unit is designed and constructed with primary and/or secondary protective barriers as are necessary to comply with the permissible dose rates, radiation levels and concentrations specified in N.J.A.C. 7:28–6.

(c) A registrant shall ensure that a radiation survey of controlled areas and of adjacent areas is performed by the PASO or by a qualified individual under the supervision of the PASO to ensure that radiation exposure of individuals conforms to the requirements of N.J.A.C. 7:28–6, and an inspection is performed of the health physics aspects of the facility when the particle accelerator is first capable of producing radiation, but before the particle accelerator is used for any purpose other than installation or assembly of the particle accelerator, or the conducting of radiation surveys and health physics inspections.

(d) The registrant shall ensure that a written report of the radiation survey and health physics inspection is prepared by the PASO or by a qualified individual under the supervision of the PASO for review by the registrant. The registrant shall maintain these reports for the duration of the life of the machine at the particle accelerator facility.

(e) Prior to operation of the particle accelerator, the registrant shall implement or cause to be implemented the recommendations listed in the radiation survey and health physics report, including any special limitations which are necessary to comply with the requirements of this chapter. The registrant shall ensure that a follow-up radiation area survey of controlled areas and of adjacent areas is performed by the PASO or by a qualified individual under the supervision of the PASO and a follow-up health physics inspection is conducted to ensure that the recommendations as implemented meet the requirements of this chapter. The registrant shall ensure that a written report of the follow-up radiation survey and the follow-up health physics inspection is prepared by the PASO or under the supervision of the PASO for review by the registrant.

(f) The registrant shall submit a copy of the radiation survey and health physics inspection report required by (d) and (e) above to the Department within 30 days of the date of the survey and health physics inspection report, and shall maintain the original radiation survey and health physics inspection report for the duration of the life of the machine at the particle accelerator facility. The radiation survey and health physics inspection reports shall be produced for review by the Department upon request.

(g) The requirements of (c) above shall be followed when changes have been made in shielding, operation, equipment, or occupancy of adjacent areas which could affect radiation exposure of any individual and at intervals not to exceed one year.

(h) The registrant shall maintain at least two radiation survey instruments suitable for measuring all levels and energies of radiation capable of being produced by the particle accelerator. At last one of these radiation survey instruments shall be calibrated, operable, and easily accessible at the facility for use at all times.

(i) A registrant shall not use or cause a radiation survey instrument to be used unless:

1. A performance test is conducted on the survey instrument prior to each day's use;

2. The survey instrument is calibrated at intervals not exceeding one year using a nationally recognized calibration criteria;

3. The survey instrument is recalibrated each time it is serviced or repaired. If the service involved only a battery replacement, the survey instrument does not have to be recalibrated; and

4. The calibration procedure has been performed by a qualified individual using nationally recognized calibration procedures which conform to those of the National Institute of Standards and Technology. These procedures shall identify the calibration source used. Results of each calibration of the survey instrument shall be maintained at the particle accelerator facility for five years. The record of these results shall be produced for review by the Department during an inspection and shall be submitted to the Department upon request.

7:28–20.8 Particle accelerator controls and interlock systems

(a) A registrant shall not operate or cause a particle accelerator to be operated unless each personnel entrance into a particle accelerator's high radiation area or exclusion area has been provided with the safety features listed below:

1. Clearly identified and easily discernible instrumentation, readouts and controls pertinent to the production of radiation;

2. A clearly identifiable switch on the accelerator control console which requires a positive, intentional action on the part of the operator for routine use in turning the particle accelerator beam on and off;

3. A personnel safety interlock system designed with a personnel safety interlock circuit. The personnel safety interlock system shall include a visual search procedure to clear personnel from the controlled area and high radiation areas prior to the production of radiation;

4. Personnel safety interlocks on all entrances into a controlled area and other high radiation areas that automatically terminate the production of radiation upon entry;

5. Circuitry such that when a safety interlock has been tripped, it shall only be possible to resume operation of the particle accelerator by manually resetting the controls, first at the position where the interlock has been tripped, and thereafter at the main control console;

6. Circuitry such that each personnel safety interlock shall allow its individual operation independent of all other interlocks;

7. Safety interlocks designed with fail-safe characteristics so that any defect or component failure in the interlock system prevents the production of radiation; and

8. A clearly identifiable emergency radiation cut-off switch shall be located in all high radiation areas and at the control console. Each cut-off switch shall include a manual reset switch so that the particle accelerator cannot be restarted from the accelerator control console without resetting the cut-off switch.

(b) A registrant shall not cause or allow a person to bypass intentionally an interlock which permits the produc-

tion of radiation, unless such bypass fulfills all of the following conditions:

1. It is authorized for and limited to a specified time period by the radiation protection committee or PASO in writing prior to the by-pass;

2. It is recorded in a permanent log;

3. It is accompanied by the posting of a prominent notice at the particle accelerator control console and at each personnel entrance being bypassed; and

4. It is terminated as soon as the need for the by-pass no longer exists as determined by the PASO.

7:28–20.9 Warning devices

(a) A particle accelerator shall not be operated unless the registrant has equipped all locations designated as high radiation areas and all entrances to such locations with clearly observable warning lights that operate when, and only when, radiation is being produced, and which shall be labeled to indicate that, when lit, radiation is being produced. The warning lights shall be included in the electrical circuitry of the particle accelerator such that when a warning light is not lit radiation cannot be produced in any area where personnel may be present.

(b) A particle accelerator shall not be operated unless the registrant has provided in each high radiation area audible and visual warning devices which shall be interlocked and activated for at least 30 seconds prior to production of radiation by the particle accelerator. Such warning devices shall be clearly discernible and labeled as to their function. The audible warning device alarm may be terminated once the high radiation area has been secured. Particle accelerator facilities designed and approved for human exposure are excluded from this requirement.

(c) A particle accelerator shall not be operated unless the registrant has identified barriers, temporary or otherwise, and pathways leading to high radiation areas in accordance with the labeling, posting and control requirements of N.J.A.C. 7:28–10.

7:28–20.10 Operating procedures

(a) A registrant shall not operate or permit the operation of a particle accelerator unless all of the following requirements have been met:

1. The particle accelerator is equipped with a means (such as, but not limited to, a locked console or a locked room) to prevent its unauthorized use;

2. The safety interlock system is not used to turn off the particle accelerator beam except in an emergency or for testing the operation of the interlock;

3. The operation of all safety and warning devices, including interlocks, is tested by the qualified machine operator and the test results recorded at intervals not to exceed 30 days and such testing is verified in writing by the PASO at intervals not to exceed 90 days; each safety and warning device shall be listed separately in a log in which the test results are recorded, and the log shall be maintained for five years at the particle accelerator facility and shall be produced for review by the Department during an inspection;

4. Electrical circuit diagrams accurately reflecting the current status of the particle accelerator and the associated interlock systems are available to the operator and for inspection by the Department. The electrical circuit diagrams shall be reviewed and/or revised at intervals not to exceed one year by the qualified machine operator and the PASO shall verify in writing at intervals not to exceed one year that the review and/or revision was performed; the registrant shall maintain a record of such review for five years at the particle accelerator facility, and the record shall be produced for review by the Department during an inspection;

5. A copy of the current operating and emergency procedures is prepared under the direction of the PASO and maintained at the particle accelerator control panel. These operating and emergency procedures shall be reviewed and/or revised under the direction of the PASO at intervals not to exceed one year. The registrant shall maintain a record of such review with the current operating and emergency procedures at the accelerator facility for the life of the particle accelerator. This record shall be produced for review by the Department during an inspection; and

6. The written operating and emergency procedures address the methods used to prevent radiation exposure at the particle accelerator facility. The procedures shall include, but not be limited to, the following topics:

i. The location and operation of the interlock systems;

ii. The safety procedures that apply to each particle accelerator;

iii. The types and use of personnel monitoring equipment;

iv. The procedures and personnel requirements for changing the target;

v. The handling and disposal procedures for disposing of a target;

vi. The procedures for surveys and wipe tests; and

vii. The emergency procedures regarding personnel and machine operations applicable to each particle accelerator.

"Analytical x-ray equipment" means any device or combination of devices used to determine the microscopic structure or composition of material utilizing x-rays, including but not limited to x-ray diffraction, x-ray spectroscopy, x-ray fluorescence, or fluorescence x-ray spectroscopy equipment.

"Enclosed beam x-ray system" means analytical x-ray equipment in which all possible x-ray paths are fully enclosed according to the requirements of N.J.A.C. 7:28–21.5, so that any part of the body cannot enter the enclosure.

"Fail-safe characteristics" means that all failures of warning and safety systems that can reasonably be anticipated will cause the equipment to fail in a mode such that personnel are safe from exposure to radiation.

"Open beam x-ray system" means analytical x-ray equipment other than enclosed beam x-ray system.

"Safety interlock" means a device or system of devices intended to prevent either the generation of x-rays or the emergence of the primary beam from the tube housing.

"X-ray accessory apparatus" means any portion of an analytical x-ray installation which is external to the x-ray tube housing and into which an x-ray beam is directed for making x-ray measurements or for other uses.

7:28–21.3 General equipment requirements

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

1. A clearly visible label bearing the conventional radiation symbol and the words: "CAUTION: THIS EQUIPMENT PRODUCES X–RAYS WHEN ENERGIZED—TO BE OPERATED ONLY BY AUTHORIZED PERSONNEL" or other words having similar meaning which shall be attached near any switch which energizes an x-ray tube.

2. A clearly visible label bearing the conventional radiation symbol and the words: "CAUTION: HIGH INTENSITY X–RAY BEAM" or other words having similar meaning which shall be located in a conspicuous location near the x-ray tube housing.

3. A clearly visible warning light with fail-safe characteristics labeled with the words: "X–RAY ON" or other words having similar meaning which shall be located near any switch that energizes an x-ray tube and shall be illuminated only when the tube is energized. The provisions of this paragraph shall be effective February 1, 1980.

4. A clearly visible warning light or indicator with fail-safe characteristics which shall indicate when the x-ray tube is producing x-rays or the port of the radioactive source is open. The warning light or indicator shall be located in a conspicuous position near the x-ray tube, and shall be clearly visible to any person aligning or adjusting the x-ray accessory equipment. The provisions of this paragraph shall be effective February 1, 1980.

5. A clearly visible label bearing the conventional radiation symbol and the words: "CAUTION: THIS EQUIPMENT CONTAINS RADIOACTIVE MATERIAL—TO BE OPERATED ONLY BY QUALIFIED PERSONNEL" or other words having similar meaning which shall be attached to any switch which energizes analytical x-ray equipment which contains a radioactive source.

6. A clearly visible label which shall be attached to each radiation source housing that contains a radioactive source. The label shall include the following information:

i. The conventional radiation symbol; and

ii. The type of radioactive material; and

iii. The activity in curies or millicuries; and

iv. The date of measurement of activity.

(b) No person shall cause, suffer, allow or permit the possession or use of any analytical x-ray equipment unless such operation is in accordance with the following procedures and within the following dose rates:

1. Written operating and alignment procedures provided by the manufacturer of the x-ray system, or by the person in charge of use of the system if the radiation source housing and x-ray accessory apparatus are not compatible components supplied by the same manufacturer.

2. Written operating procedures shall be such that a qualified operator following instructions will not receive in any one hour a dose equivalent in excess of 37.5 mrem to the hands and forearms or 2.5 mrem to the whole body, gonads, blood-forming organs or lens of the eye.

3. Alignment procedures shall be such that a qualified worker aware of the radiation hazards will not receive in any one hour a dose equivalent in excess of 37.5 mrem to the hands and forearms or 2.5 mrem to the whole body, gonads, blood-forming organs, or lens of the eye while following these instructions. If either of these dose rates is likely to be exceeded, a definite warning shall be included in the alignment instructions.

4. The dose due to unwanted radiation from components such as high voltage rectifiers shall not exceed 10 mrem in a week in any accessible region 5 cm from the outside surface of the generator cabinet. Where an individual may be in the vicinity of the equipment while it is operating for as long as 40 hours per week, the dose rate shall not exceed 0.25 mrem/hr.

5. The x-ray accessory apparatus shall include a beam trap or other barrier with sufficient shielding so that the dose rate due to the transmitted primary beam does not exceed 0.25 mrem/hr under normal operating conditions. In the presence of scattered radiation this requirement

shall be considered met for x-ray tube sources if the inherent shielding of the trap or barrier is at least equivalent to the thickness of lead specified in the following table for the maximum rated anode current and potential. In the case of isotope sources that required barrier thickness shall be determined by a qualified expert.

Thickness of lead Required for a Primary

Beam Barrier Located 5 cm from the Focal Spot

Anode Current (ma)	Thickness of lead (mm)		
	50kVp	70kVp	100kVp
20	1.5	5.6	7.7
40	1.6	5.8	7.9
80	1.6	5.9	
160	1.7		

7:28–21.4 Additional equipment requirements for open beam x-ray systems

(a) No person shall cause, suffer, allow or permit the possession or use of any open beam analytical x-ray equipment unless it is equipped with the following in addition to the requirements of section 3 of this subchapter:

1. A clearly visible warning light or indicator which shall be located near each individual x-ray tube shutter and shall indicate when the shutter is open.

2. A suitable barrier to clearly delineate the boundary between the radiation area and the controlled area.

3. A system barrier surrounding each radiation area with sufficient inherent shielding so that the dose equivalent received by individuals in the surrounding controlled area does not exceed five mrem in any one hour or 100 mrem in any five consecutive days.

4. A beam shutter for each port of the radiation source housing. Such beam shutter shall be interlocked with the x-ray accessory apparatus coupling, or collimator, in such a way that the port will be open only when the collimator or coupling is in place. Shutters at unused ports shall be secured to prevent casual opening.

5. A guard or interlock which prevents entry of any part of the body into the primary beam path.

6. The provisions of paragraphs 3, 4 and 5 of this subsection shall apply to new open beam analytical x-ray equipment after February 1, 1980. Open beam analytical x-ray equipment in use prior to February 1, 1980 shall be exempt from the provisions of paragraphs 3, 4 and 5 unless such equipment is sold, leased, loaned or otherwise transferred from one user to another whether gratuitously or for consideration.

(b) No person shall cause, suffer, allow or permit the possession or use of any open beam analytical x-ray equipment unless it is operated in accordance with the following procedures and within the following dose rates:

1. The x-ray generator, the control panel and all other parts of the analytical x-ray system, except the x-ray tube housing, shall be so constructed that with all the shutters closed, the stray radiation measured at a distance of five centimeters from its surface is not capable of producing a dose in excess of 0.25 millirem in one hour at any specified tube rating.

2. The x-ray tube housing shall be so constructed that with all shutters closed, the leakage radiation measured at a distance of 5 centimeters from its surface is not capable of producing a dose in excess of 2.5 millirem in one hour at any specified tube rating.

3. Radiation exposure levels in the vicinity of controls and adjustments of the x-ray accessory apparatus used during routine operation shall not exceed 37.5 mrem/hr to the hands or 2.5 mrem/hr to the whole body, gonads, blood-forming organs, or lens of the eye.

7:28–21.5 Additional equipment requirements for enclosed beam X-ray systems

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

1. A sufficient number of safety interlocks so that the opening of any section of the enclosure during normal operation, or routine alignment, or routine maintenance will prevent either the generation of x-rays or the emergence of the primary beam from any x-ray tube housing port.

2. A chamber or coupled chambers to enclose the radiation source, sample, detector and analyzing crystal. Any such chamber shall be constructed so that it can not be entered by any part of the body during normal operation. The provisions of this paragraph shall be effective February 1, 1980.

3. A sample chamber closure which shall be interlocked with either the x-ray tube high voltage supply or with a shutter in the primary beam so that no x-ray beam can enter the sample chamber while it is open. Such interlock shall be of fail-safe design. The provisions of this paragraph shall be effective February 1, 1980.

(b) No person shall cause, suffer, allow or permit the possession or use of any enclosed beam analytical x-ray equipment unless it is constructed in such manner as to limit the leakage x-rays at a distance of 5 centimeters from any accessible surface during normal operation to less than 0.25 millirem in one hour at any specified tube rating.

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).

SUBCHAPTER 22. QUALITY ASSURANCE PROGRAMS FOR MEDICAL DIAGNOSTIC X–RAY INSTALLATIONS

Authority

N.J.S.A. 26:2D–1 et seq.

Source & Effective Date

R.2001 d.37, effective January 16, 2001.
See: 32 N.J.R. 1459(a), 33 N.J.R. 292(b).

7:28–22.1 Purpose, scope and applicability

(a) The purpose of this subchapter is to increase protection to the public and radiation workers from unnecessary exposure to radiation and to reduce the occurrence of misdiagnosis caused by faulty equipment and operator error.

(b) This subchapter establishes requirements for the development and implementation of quality assurance programs to ensure that registrants of diagnostic x-ray equipment who perform diagnostic x-ray procedures in the healing arts achieve consistent high quality imaging and improve diagnosis while reducing unnecessary radiation to the patients and workers. This subchapter further establishes certain responsibilities of registrants of radiation sources used in the practice of diagnostic radiology. This subchapter also establishes the qualifications and training requirements for medical physicists, medical physicist assistants and qualified individuals designing or implementing quality assurance programs in accordance with this subchapter. Certification requirements and associated fees are also established for medical physicists and medical physicist assistants.

(c) All registrants of medical diagnostic x-ray imaging equipment and computed tomography equipment, which is used for performing diagnostic radiography, fluoroscopy, x-ray bone densitometry, or computed tomography in the healing arts, are required to develop and continually implement quality assurance programs. Such equipment includes, but is not limited to, equipment used in performing diagnostic radiology procedures in hospital, medical, podiatric, chiropractic, industrial, school, and government facilities.

(d) The provisions of this subchapter are not applicable to diagnostic radiographic mammography equipment that must comply with the Federal Mammography Quality Standards Act, 42 U.S.C.A. § 263(b), or N.J.A.C. 7:28–15.4.

7:28–22.2 Definitions

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

"CT" means computed tomography.

"Dedicated interventional special procedure suite" means a room dedicated to the performance of fluoroscopic interventional special procedures. These procedures include, but are not limited to, angioplasty, angiography, cardiac catheterization, etc.

"Immediate supervision" means in-room supervision.

"Initially" means no later than the date of the required implementation of the quality assurance program specified in N.J.A.C. 7:28–22.14 or within 60 days of the date the x-ray machine is acquired.

"QA" means quality assurance.

"QC" means quality control.

"Qualified medical physicist for the supervision of quality assurance programs for computed tomography equipment" means an individual who meets the qualifications for a "qualified medical physicist for the supervision of quality assurance programs for computed tomography equipment" in N.J.A.C. 7:28–22.12(b).

"Qualified medical physicist for the supervision of quality assurance programs for diagnostic x-ray imaging" means an individual who meets the qualifications for a "qualified medical physicist for the supervision of quality assurance programs for diagnostic x-ray imaging" in N.J.A.C. 7:28–22.12(a).

"Qualified medical physicist assistant in fluoroscopy" means an individual who meets the qualifications for a "qualified medical physicist assistant in fluoroscopy" in N.J.A.C. 7:28–22.12(d).

"Qualified medical physicist assistant in radiography" means an individual who meets the qualifications for a "qualified medical physicist assistant in radiography" in N.J.A.C. 7:28–22.12(c).

"Registrant" means a person who is required to register a source of radiation with the Department pursuant to this chapter.

7:28–22.3 General provisions

(a) No person shall perform or permit the performance of a diagnostic x-ray procedure in the healing arts using radiographic, fluoroscopic, x-ray bone densitometry, or computed tomography (CT) equipment unless the registrant has developed and continues to implement a quality assurance program in accordance with the compliance schedule in N.J.A.C. 7:28–22.14 and that satisfies the requirements of this subchapter.

(b) Subject to (c) below, the quality assurance program shall contain the following elements:

1. A quality assurance program manual as specified in N.J.A.C. 7:28–22.4;

2. Quality control tests as specified in N.J.A.C. 7:28–22.5, 22.6 or 22.7 (as appropriate for the diagnostic x-ray equipment);

3. An initial and annual (not to exceed 14 months) Medical Physicist's QC Survey as specified in N.J.A.C. 7:28–22.8, 22.9, or 22.10; and

4. For item 13 in Table 6, Medical Physicist's Computed Tomography QC Survey, above, the medical physicist shall review the completed QC test records that have been performed by the registrant for the previous year to ensure the tests were performed properly and corrective actions taken.

5. For item 14 in Table 6, Medical Physicist's Computed Tomography QC Survey, below, the medical physicist shall prepare a report that reviews the overall quality assurance program being carried out by the registrant and contains:

i. Raw data, results and recommendations of the medical physicist's equipment tests performed in accordance with items 1 through 12 in Table 6, Medical Physicist's Computed Tomography QC Survey, above; and

ii. Results and recommendations of the medical physicist's review performed in accordance with item 14 in Table 6, Medical Physicist's Computed Tomography QC Survey, above.

7:28–22.11 Quality assurance for x-ray bone densitometer equipment

(a) The registrant of any x-ray bone densitometer shall continuously carry out a quality assurance program consistent with the equipment manufacturer's recommendations.

(b) The registrant shall ensure that the items listed below describing the operation and calibration of the equipment are maintained at the facility:

1. A copy of the manufacturer's specific quality assurance program recommendations and the operating manual;

2. Documentation of the quality assurance program and quality control tests for the x-ray bone densitometer;

3. Instructions on the use of the phantom(s), or testing appropriate for the system and allowable variations for the indicated parameters; and

4. A radiation safety manual as required in N.J.A.C. 7:28–15.9(a)8.

(c) The registrant shall ensure that the manufacturer's recommended test procedures and frequencies for the x-ray bone densitometer are followed and the test results are recorded.

(d) The registrant shall ensure that the records of tests required by (c) above are maintained for at least one year.

7:28–22.12 Qualifications of medical physicists and medical physicist assistants

(a) Only a person who holds a valid certificate issued by the Department in accordance with N.J.A.C. 7:28–22.13(a) and meets at least one of the following criteria may perform the duties of a "qualified medical physicist for the supervision of quality assurance programs for diagnostic x-ray imaging" as required in this subchapter:

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 Medical Physics in Diagnostic Imaging Physics;

iii. Certification issued by the Fellowship in the Canadian College of Physicists in Medicine that is equivalent to (a)1i or ii above; or

iv. Certification by other national certifying boards, which may be recognized by the Commission, where the person seeking recognition as a qualified medical physicist for the supervision of quality assurance programs for diagnostic x-ray imaging has petitioned the Commission in writing and where the Commission has issued a written determination that the certification in question meets the criteria of a qualified medical physicist pursuant to this section;

2. A master's or doctorate degree from an accredited college in radiological health, radiation sciences, physics, chemistry, environmental sciences, engineering or a related field and at least three years of professional, clinical and technical experience in the field of radiological physics, including the performance of quality control tests of diagnostic x-ray imaging, that was obtained under the supervision of an individual who meets the requirements of this section, except the requirement to hold a certificate issued by the Department; or

3. Any individual who does not meet at least one of the foregoing criteria may petition the Commission for recognition as a qualified medical physicist for the supervision of quality assurance programs for diagnostic x-ray imaging. The individual shall submit a written petition to the Commission that contains sufficient information on his or her educational, professional, clinical, technical, employment and/or any other relevant experience. The Commission may approve any such petition based on its determination that the individual demonstrates competence to act as a qualified medical physicist for the supervision of quality assurance programs for diagnostic x-ray imaging.

(b) Only a person who holds a valid certificate issued by the Department in accordance with N.J.A.C. 7:28–22.13(a) and meets at least one of the following criteria may perform the duties of a "qualified medical physicist for the supervision of quality assurance programs for computed tomography equipment" as required in this subchapter:

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 Medical Physics in Diagnostic Imaging Physics;

iii. Certification issued by the Fellowship in the Canadian College of Physicists in Medicine that is equivalent to (b)1i or ii above; or

iv. Certification by other national certifying boards, which may be recognized by the Commission, where the person seeking recognition as a qualified medical physicist for the supervision of quality assurance programs for computed tomography x-ray equipment has petitioned the Commission in writing and where the Commission has issued a written determination that the certification in question meets the criteria of a qualified medical physicist pursuant to this section;

2. A master's or doctorate degree from an accredited college in radiological health, radiation sciences, physics, chemistry, environmental sciences, engineering or a related field and at least three years of professional, clinical and technical experience in the field of radiological physics, including the performance testing of computed tomography equipment that was obtained under the supervision of an individual who meets the requirements of this section, except the requirement to hold a certificate issued by the Department; or

3. Any individual who does not meet at least one of the foregoing criteria may petition the Commission for recognition as a qualified medical physicist for the supervision of quality assurance programs for computed tomography equipment. The individual shall submit a written petition to the Commission that contains sufficient information on his or her educational, professional, clinical, technical, employment and/or any other relevant experience. The Commission may approve any such petition based on its determination that the individual demonstrates competence to act as a qualified medical physicist for the supervision of quality assurance programs for computed tomography equipment.

(c) Only a person who holds a valid certificate issued by the Department in accordance with N.J.A.C. 7:28–22.13(a), meets one of the criteria contained in (c)1 through 5 below and also meets the criterion in (c)6 below may perform the duties of a "qualified medical physicist assistant in radiography":

1. Is currently ARRT certified in general radiography or holds a current New Jersey license as a diagnostic radiologic technologist and has five years of experience as a practicing diagnostic technologist, one year of which shall include performing quality control tests on radiographic equipment;

2. Is currently ARRT certified in both general radiography and in quality management with three years of experience as a practicing diagnostic radiologic technologist;

3. Has a bachelors degree from an accredited college or university in biology, chemistry, radiation sciences, physics, engineering or mathematics and four years of technical experience performing quality control tests on radiographic equipment in the field of radiological health;

4. Has a master's degree or a doctorate degree from an accredited college or university in radiological health, radiation sciences, physics, chemistry, environmental sciences, engineering or a related field and two years of technical experience performing quality control tests on radiographic equipment in the field of radiological health; or

5. Any individual who does not meet at least one of the foregoing criterion may petition the Commission for recognition as a qualified medical physicist assistant in radiography. The individual shall submit a written petition to the Commission that contains sufficient information on his or her educational, professional, clinical, technical, employment and/or any other relevant experience. The Commission may approve any such petition based on its determination that the individual demonstrates competence to act as a qualified medical physicist assistant in radiography.

6. In addition to the criteria in (a)1 through 5 above, the individual shall document to the satisfaction of the Department, that the individual has received, at a minimum, training and instruction on performing QC tests and has performed quality control tests 1 through 9 of Table 4, Medical Physicist's Radiographic QC Survey, in N.J.A.C. 7:28–22.8 on at least five radiographic units while under the immediate supervision of a qualified medical physicist for the supervision of quality assurance programs for diagnostic x-ray imaging.

(d) Only a person who holds a valid certificate issued by the Department in accordance with N.J.A.C. 7:28–22.13(a), meets one of the criteria contained in (d)1 through 5 below and also meets the criterion in (d)6 below may perform the duties of a "qualified medical physicist assistant in fluoroscopy":

1. Is currently ARRT certified in general radiography or holds a current New Jersey license as a diagnostic radiologic technologist and has five years of experience as a practicing diagnostic technologist, one year of which shall include performing quality control tests in fluoroscopy;

2. Is currently ARRT certified in both general radiography and in quality management with three years of experience as a practicing diagnostic radiologic technologist;

3. Has a bachelors degree from an accredited college or university in biology, chemistry, radiation sciences, physics, engineering or mathematics and four years of technical experience performing quality control tests on fluoroscopic equipment in the field of radiological health;

4. Has a master's degree or a doctorate degree from an accredited college or university in radiological health, radiation sciences, physics, chemistry, environmental sciences, engineering or a related field and two years of technical experience performing quality control tests on fluoroscopic equipment in the field of radiological health; or

5. Any individual who does not meet at least one of he foregoing criterion may petition the Commission for recognition as a qualified medical physicist assistant in fluoroscopy. The individual shall submit a written petition to the Commission that contains sufficient information on his or her educational, professional, clinical, technical, employment and/or any other relevant experience. The Commission may approve any such petition based on its determination that the individual demonstrates competence to act as a qualified medical physicist assistant in fluoroscopy.

6. In addition to the criteria in (d)1 through 5 above, the individual shall document to the satisfaction of the Department, that the individual has received, at a minimum, training and instruction on performing QC tests and has performed quality control tests 1 through 6, and 9 of Table 5, Medical Physicist's Fluoroscopic QC Survey in N.J.A.C. 7:28–22.9 on at least five fluoroscopic units while under the immediate supervision of a qualified medical physicist for the supervision of quality assurance programs for diagnostic x-ray imaging.

7:28–22.13 Certification and decertification of qualified medical physicists and qualified medical physicist assistants

(a) The Department may issue a certificate valid for up to two years to persons who submit an application to the Department documenting to the satisfaction of the Department that the person meets the qualifications specified in N.J.A.C. 7:28–22.12(a), (b), (c) or (d).

(b) No person shall perform any QC test that is part of the Medical Physicist's Radiographic, Fluoroscopic or Computed Tomography QC Survey without a current certificate issued by the Department, pursuant to this subchapter.

(c) Each certificate shall expire on December 31 of the first odd numbered year following the year of issuance. A certificate may be renewed for a biennial term commencing January 1 of every even numbered year and expiring on December 31 of the following year.

(d) Any person who was issued a certificate pursuant to (a) above, shall display the certificate upon request.

(e) In order to maintain a current certificate, a person shall renew his or her certificate by submitting a completed renewal application to the Department at least 30 days prior to the date of expiration.

(f) A person who wishes to renew an expired certificate shall submit a renewal application to the Department. Such certificate shall be renewed for a period extending from the date of renewal to midnight, December 31 of the next odd number year.

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

1. Initial certification fee:

   i. $50.00 for one category;

   ii. $25.00 for each additional category;

2. Renewal fee:

   i. $25.00 for each category.

(h) The fees accompanying the application or biennial renewal application shall be in the form of a check or money order made payable to the Treasurer, State of New Jersey. Fees are non-refundable. Applications for certification are available from the Bureau of Radiological Health, PO Box 415, Trenton, NJ 08625–0415.

(i) A person certified by this subchapter shall inform the Department of any change in the address of record within 30 days of such change.

(j) The Department, in addition to any penalties authorized by the Act, may deny an application for a certificate and may revoke or suspend a certificate if the person has:

1. Violated any provision of this chapter;

2. Disregarded the safety, health and welfare of the public in the performance of his or her professional duties;

3. Developed or implemented a QA/QC program or performed a Medical Physicist's QC Survey that is not in conformance with standards in this subchapter; or

4. Affixed his or her signature to any QA/QC program, report or QC survey, which was not prepared by him or her.

7:28–22.14 Compliance schedule

(a) Registrants required to develop and implement quality assurance programs in accordance with N.J.A.C. 7:28–22.3 shall comply with the following schedule:

1. All out-of-State registrants and registrants whose x-ray equipment is registered in Essex and Gloucester counties shall have quality assurance programs fully im-

plemented, including a completed initial Medical Physicist QC Survey, by February 28, 2001.

2. Registrants whose x-ray equipment is registered in Bergen County shall have quality assurance programs fully implemented, including a completed initial Medical Physicist QC Survey, by March 31, 2001.

3. Registrants whose x-ray equipment is registered in Hudson, Somerset, and Burlington counties shall have quality assurance programs fully implemented, including a completed initial Medical Physicist QC Survey, by April 30, 2001.

4. Registrants whose x-ray equipment is registered in Union, Mercer and Cape May counties shall have quality assurance programs fully implemented, including a completed initial Medical Physicist QC Survey, by June 30, 2001.

5. Registrants whose x-ray equipment is registered in Morris and Ocean counties shall have quality assurance programs fully implemented, including a completed initial Medical Physicist QC Survey, by July 31, 2001.

6. Registrants whose x-ray equipment is registered in Passaic and Camden counties shall have quality assurance programs fully implemented, including a completed initial Medical Physicist QC Survey, by August 31, 2001.

7. Registrants whose x-ray equipment is registered in Sussex, Monmouth, Salem, and Cumberland counties shall have quality assurance programs fully implemented, including a completed initial Medical Physicist QC Survey, by October 31, 2001.

8. Registrants whose x-ray equipment is registered in Middlesex, Warren, Hunterdon, and Atlantic counties shall have quality assurance programs fully implemented, including a completed initial Medical Physicist QC Survey, by November 30, 2001.

7:28–22.15 Severability

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

SUBCHAPTER 23. (RESERVED)

SUBCHAPTER 24. NUCLEAR MEDICINE TECHNOLOGY

Authority

N.J.S.A. 26:2D–1 et seq., specifically 26:2D–7 and 26:2D–9(*l*).

Source and Effective Date

R.2000 d.171, effective April 17, 2000.
See: 31 N.J.R. 3012(a), 32 N.J.R. 1388(a).

Subchapter Historical Note

Subchapter 24, Nuclear Medicine Technology, was repealed and Subchapter 24, Nuclear Medicine Technology, was adopted as new rules by R.2000 d.171, effective April 17, 2000. See: Source and Effective Date.

7:28–24.1 Purpose, scope and applicability

(a) This subchapter establishes educational and licensure requirements, as well as delineating the scope of practice, for persons engaged in the practice of nuclear medicine technology. This subchapter further establishes certain responsibilities of authorized medical users, owners, and registrants of radiation sources used in the practice of nuclear medicine technology. This subchapter also establishes standards for the operation of, and the Department's approval of, educational programs in nuclear medicine technology.

(b) This subchapter shall not be interpreted as precluding persons specializing in nuclear medicine physics, computer science, or engineering from manipulating data under the supervision of an authorized medical user.

(c) The following are exempt from the requirement to possess a nuclear medicine technology license:

1. Authorized medical users;

2. Hospital residents, hospital interns or hospital fellows specializing in nuclear medicine, who are under the direction of an authorized medical user;

3. Hospital residents, hospital interns or hospital fellows involved in nuclear medicine procedures but not specializing therein, provided that they are acting under the direct supervision of either an authorized medical user or a licensed nuclear medicine technologist who is under the direction of an authorized medical user;

4. Students enrolled in and attending a school or college of medicine or osteopathy, who are acting within the school's curriculum, provided that students are under the direct supervision of either an authorized medical user or a licensed nuclear medicine technologist who is under the direction of an authorized medical user; and

5. Students enrolled in and attending a school of nuclear medicine technology, who are acting within the school's approved curriculum, provided that such students are identified on the student list filed by the school with the Department, and are acting in a clinical affiliation approved by the Department, upon the recommendation of the Commission, and are under the direct or immediate supervision of either an authorized medical user or a licensed nuclear medicine technologist who is under the direction of an authorized medical user.

(d) The requirements of this subchapter shall not apply to a licensed radiopharmacy operating within the scope of its Department radioactive materials license, New Jersey Board of Pharmacy license, and Nuclear Regulatory Commission license.

(e) The provisions of this subchapter do not apply to the therapeutic use of sealed sources of ionizing radiation.

7:28–24.2 Definitions

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

"Authorized medical user" means a licensed physician who is identified as an authorized user on a Department radioactive materials license that authorizes the medical use of naturally occurring or accelerator produced radioactive materials or on a Nuclear Regulatory Commission license that authorizes the medical use of by-product materials.

"Diagnostic dose" means a radionuclide or radiopharmaceutical which is intended for diagnostic purposes.

"Direct supervision" means guidance, direction and instruction by an authorized medical user or license nuclear medicine technologist who is personally aware of, and maintains independent professional responsibility for, the procedure intended for a given patient, and is present in the facility and is available for immediate assistance.

"Immediate supervision" means in-room presence for instruction, direction and guidance by an authorized medical user or a licensed nuclear medicine technologist, who is available to assume control of the given procedure.

"Initial application" means the first application submitted by an individual to the Department for a license to practice nuclear medicine technology.

"Licensed nuclear medicine technologist" (LNMT) means a person who possesses a valid license issued by the Department to engage in the practice of nuclear medicine technology.

"Licensed physician" means an individual who holds a plenary license to practice medicine issued by the New Jersey State Board of Medical Examiners.

"Practice of nuclear medicine technology" means preparing radiopharmaceuticals for administration to humans, administering radiopharmaceuticals to humans, positioning of patients for examinations which require the administration of radiopharmaceuticals to humans, setting technical factors for examinations which require the administration of radiopharmaceuticals to humans, operating imaging and/or measuring equipment for examinations which require the administration of radiopharmaceuticals to humans, or acquiring and manipulating patient data, other than demographic and clinical data, with or without the use of computers for procedures requiring the administration of radiopharmaceuticals.

4. Has passed, more than three years prior to the application for a license, a nuclear medicine technology examination approved by the Commission, and has legally engaged in the practice of nuclear medicine technology for at least 1,000 hours during the three years preceding the application for a license in a manner consistent with this chapter.

(b) The Department may deny a license application if the applicant has committed any act or omission specified at N.J.A.C. 7:28–24.9(a).

7:28–24.6 Temporary, conditional and restricted licenses

(a) The Department may issue a temporary license to any person who has graduated from a nuclear medicine technology educational program approved by the Department pursuant to N.J.A.C. 7:28–24.11. A temporary license shall be issued only if the Department finds that its issuance will not violate the purposes of the Act or tend to endanger public health and safety.

(b) A temporary license shall expire 60 calendar days after the date of graduation. A single 30 calendar day extension may be granted provided that the applicant has taken an approved licensing examination and is awaiting the results of the examination.

(c) The Department, at its discretion, may issue a conditional or restricted license including, but not limited to, a condition or restriction limiting the scope of practice of a licensed nuclear medicine technologist.

(d) No person who possesses a conditional or restricted license shall practice outside of the conditions or restrictions as listed on the license.

7:28–24.7 License expiration and license renewal

(a) No nuclear medicine technologist shall practice without a valid New Jersey nuclear medicine technology license.

(b) A nuclear medicine technologist shall inform the Department of any change in the address of record within 30 calendar days of the change.

(c) In order to maintain a valid license, a nuclear medicine technologist shall renew his or her license biennially by submitting a renewal application for a nuclear medicine technology license and the required renewal fee specified in N.J.A.C. 7:28–24.8.

(d) Each license expires on December 31 of the first even numbered year following the year of its issuance. A license may be renewed for a biennial term commencing January 1 of every odd numbered year and expiring on December 31 of the following year.

(e) A nuclear medicine technologist who possesses an expired license may renew the license, provided that the license has not been expired for more than three years. An individual who wishes to renew an expired license shall submit a renewal application and the current renewal fee to the Department. Such licenses shall be renewed for a period extending from date of renewal to midnight, December 31 of the next even numbered year.

(f) A nuclear medicine technologist who possesses a license which has been expired for more than three years may not have that license renewed, but may apply for a new license through re-examination and other applicable requirements for initial license applications at N.J.A.C. 7:28–24.4 or, if applicable, at N.J.A.C. 7:28–24.5.

7:28–24.8 Fees

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

1. Examination application fee: $75.00;
2. Initial license application fee: $40.00;
3. Biennial license renewal fee: $40.00.

(b) All fees shall be in the form of a check or money order made payable to the Treasurer, State of New Jersey.

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

2. All examination and initial license applications and associated fees shall be mailed to:

State of New Jersey
Department of Environmental Protection
Bureau of Radiological Health
PO Box 415
Trenton, New Jersey 08625–0415

3. All biennial license renewal applications and associated fee shall be mailed to:

State of New Jersey
Department of Treasury
Division of Revenue
PO Box 417
Trenton, New Jersey 08625–0417

7:28–24.9 Examination application or license application denial, license revocation and suspension

(a) The Department, in addition to any penalties authorized by the Act, may deny any examination or license application, and may revoke or suspend a nuclear medicine technology license, when the applicant or licensed nuclear medicine technologist has:

1. Violated any of the provisions contained in N.J.A.C. 7:28–24.3(b), (c), (d), (f), (h), (i), (j), (k) or (*l*);

2. Been convicted of, any crime which relates, or could relate, adversely to the practice of nuclear medicine technology. For the purpose of this section, a plea of guilty, non vult, no contest, or any other such disposition of alleged criminal activity shall be deemed a conviction;

3. Has been admitted to a pretrial intervention program or the substantial equivalent thereof based upon alleged conduct which relates, or could relate, adversely to the practice of nuclear medicine technology;

4. Has had his or her certification, registration, or license to practice nuclear medicine technology revoked or suspended by any other state or certifying agency for reasons consistent with this chapter; or

5. Is incapable, for medical or any other good cause, of discharging the functions of a licensee in a manner consistent with the health, safety and welfare of the public.

(b) Any revocation or suspension issued pursuant to this section shall be in accordance with the following:

1. Revocation or suspension of a nuclear medicine technologist's license shall be initiated by the Department through issuance of a Notice of Revocation or Notice of Suspension. The Notice shall include the findings of the Department upon which the revocation or suspension is based. The Notice shall also include the date upon which the revocation or suspension shall become effective. The Notice may be accompanied by an Order requiring compliance with the Radiation Protection Act, N.J.S.A. 26:2D–1 et seq. or any rule promulgated pursuant thereto. Within 20 days of delivery of the Notice, an individual whose license is to be revoked or suspended may deliver to the Commissioner a written request for an administrative hearing, pursuant to the Administrative Procedure Act, N.J.S.A. 52:14B–1 et seq. and the Uniform Administrative Procedure Rules, N.J.A.C. 1:1, to contest such revocation or suspension. The individual's request for an administrative hearing shall include a written statement of all issues of fact or law contained within the Notice which are disputed by the individual.

2. If the Commissioner determines the matter to be a contested case, he shall refer the matter to the Office of Administrative Law for hearing before an administrative law judge, pursuant to the Administrative Procedure Act and the Uniform Administrative Procedure Rules. Upon review of the record of the administrative hearing in contested cases the Commissioner may affirm, modify or reject the initial decision of the administrative law judge and/or the findings of the Department. If the Commissioner finds that the charges in a contested case have not been proven, he shall order them dismissed. If the Department's findings are found to be true, the Commissioner may, in his or her discretion, issue an order suspending or revoking the license of the individual. In uncontested cases, the revocation or suspension of the individual's license shall be effective as of the date specified in the Notice of Revocation or Notice of Suspension.

(c) This subchapter shall not in any way affect or abridge the powers of the Department to issue emergency orders pursuant to N.J.S.A. 26:2D–12 or to bring an action in Superior Court, pursuant to N.J.S.A. 26:2D–13.

7:28–24.10 School of nuclear medicine technology: standards for approval

(a) A school of nuclear medicine technology shall be approved by the Department if:

1. The curriculum includes the following minimum content areas or prerequisites:

i. Basic anatomy, physiology, and pathology;

ii. Intravenous injections, both direct and peripheral, and other methods shall include, but not limited to, into existing urinary catheters (indwelling and other), into existing nasogastric tubes or other gastric or intestinal feeding tubes, into existing central intravenous lines, through existing spinal needles placed into the subarachnoid space;

iii. Radiation physics and nuclear medicine physics;

iv. Radionuclide chemistry and pharmacology to include adverse reactions to radiopharmaceuticals and other pharmaceuticals used in nuclear medicine;

v. Statistics;

vi. Nuclear medicine departmental organization and function;

vii. Nuclear instrumentation;

viii. Radiation biology;

ix. Radionuclide therapy;

x. Radiation safety and radiation protection standards and codes;

xi. Laboratory procedures and techniques;

xii. Clinical application of radionuclides, for both diagnostic and therapeutic purposes;

xiii. Records and administrative procedures;

xiv. Methods of patient care;

xv. Medical law and ethics;

xvi. Computer applications;

xvii. Quality assurance; and

xviii. State and Federal regulations;

2. The curriculum includes a valid plan for well-structured competency-based clinical education; and

3. The school of nuclear medicine technology additionally complies with the Essentials and Guidelines of an Accredited Educational Program for the Nuclear Medicine Technologist (1997), which have been jointly adopted, jointly revised and published by the American College of Radiology, American Society of Radiologic Technologists, Society of Nuclear Medicine and Society of Nuclear Medicine—Technologist Section or their successors. These Essentials and Guidelines are incorporated into this rule by reference herein, as amended and supplemented, and may be obtained by contacting the Department.

7:28–24.11 School of nuclear medicine technology: process for approval; provisional approval; probationary approval; withdraw of approval and other general provisions

(a) The Department, upon recommendation of the Commission, shall approve a school of nuclear medicine technology if it has been determined that the school has complied with the requirements of this subchapter.

(b) In order to become an approved school, a school of nuclear medicine technology shall apply to the Department. Along with the application, a school of nuclear medicine technology applying for approval shall also submit to the Department a self-study document which shall include, but is not limited to, information regarding the school's instructional curriculum, faculty, classroom and clinical facilities, student policies and administrative organization. After review of the school's application and self-study document and a determination that the school substantially meets the standards set forth in this subchapter, the Department, upon the recommendation of the Commission, may provisionally approve the school. When the Department has determined that the school is in full compliance with the requirements of this subchapter, full approval may be issued.

(c) No school of nuclear medicine technology shall enroll students until provisional approval has been received from the Department.

(d) No school shall hold itself out to be an approved school of nuclear medicine technology until the school is approved by the Department.

(e) Upon the request of the Department and/or Commission, a school of nuclear medicine technology or its affiliates shall:

1. Demonstrate, to the satisfaction of the Department and/or Commission, that it complies with the requirements of this subchapter;

2. Permit an appointee of the Commission and/or an employee of the Department to conduct a site inspection. The Department, upon the recommendation of the Commission, may accept a site inspection or accreditation by a national accreditation agency recognized by the Commission; and

3. Make available to the Department and/or Commission such information or records as the Department or Commission, or their representatives, shall request.

(f) The Department, upon the recommendation of the Commission, may reduce the status of a school of nuclear medicine technology's approval to probationary approval for failure to comply with the provisions contained in this subchapter. A school on probationary approval shall:

1. Within a period of time determined by the Department, correct all specified deficiencies contained in a written agreement approved by the Department as recommended by the Commission;

2. Within 15 calendar days of receipt of notification, notify all enrolled students and all applicants via certified mail of the school's probationary approval status; and

3. Within 15 calendar days of receipt of notification, submit to the Department a copy of the probationary notice supplied to students.

(g) Any school of nuclear medicine technology subject to this subchapter shall:

1. Prepare and maintain a current and accurate written course syllabus for each content area delineated in N.J.A.C. 7:28–24.10(a). These documents shall include, but are not limited to: lesson plans, learning objectives, classroom schedules, and the student evaluation instruments. These documents shall be on file at the school and shall be produced for review by the Department or its representative during an inspection and shall be submitted to the Department upon request;

2. Issue to each candidate prior to admission a course catalog, bulletin, or other written statement which shall be currently dated and include a description of the curriculum as a whole, course descriptions, and information concerning amounts and terms for payment of any tuition or other fees or expenses to be incurred. The information contained in these documents shall accurately reflect the program being offered;

3. Report in writing to the Department, within 30 calendar days of any student's matriculation date, the name and address of each new student enrolled and, within 30 calendar days of any student's completion date, the name and address of each student who has successfully completed the course of study;

4. Assign students only to clinical affiliates which have been approved by the Department, upon the recommendation of the Commission;

5. Ensure that, while assigned to clinical education, students shall have on their person visible identification name badges which indicate that they are student nuclear medicine technologists;

6. Have and adhere to an educational plan for clinical assignments with clinical objectives relating to the practice of nuclear medicine technology. Students shall not take the responsibility or the place of licensed nuclear medicine technologists;

7. Ensure that prior to a student's demonstration of clinical competency in a given nuclear medicine technology activity that the activity is performed with immediate supervision. After clinical competency in the activity has been determined, the activity may be performed under direct supervision;

8. Ensure that radiation monitoring devices are worn by students, while assigned to any controlled area;

9. Ensure that all students are provided with whole body and finger radiation monitoring devices, during their period of attendance. Student exposure to radiation shall not exceed the occupational limits prescribed in this chapter. Within 30 days of the school's receipt of the radiation dosimetry report, the school shall inform all students of their most recent exposure readings. In the event that a student receives a high exposure reading, the school shall begin an investigation within 14 days of the school's receipt of a high exposure reading to find the cause and prevent recurrence of exposure which is deemed to be unnecessary. The results of this investigation and any action taken by the school shall be maintained in the student's file. Within 90 calendar days of departure from the school, students shall be provided with a record of their exposure history;

10. Inform the Department within 30 calendar days of any change that could adversely affect the program's ability to fulfill its commitment to students or has altered how the program operates since its last review and approval by the Department. Such changes include, but are not limited to: a change in any program official or faculty member, curriculum, loss of a clinical affiliate, the sequencing of courses, length of the program, sponsorship of the program; and

11. Continue to comply with all standards for approval in N.J.A.C. 7:28–24.10.

(h) A school of nuclear medicine technology may have its approval, provisional approval and/or probationary approval denied or withdrawn by the Department, upon the recommendation of the Commission, for failure to continue to comply with all provisions of this subchapter.

(i) The Department shall notify a school of nuclear medicine technology, by certified mail, of any violation or deficiency resulting in denial, withdraw, or withholding of approval or a change in approval status.

(j) The effective date of any notice issued pursuant to (f) or (h) above shall be 20 days following receipt of the Department's notice, unless otherwise stated in the notice.

(k) A school of nuclear medicine technology's approval may be terminated if the school does not have any students enrolled for a period of two successive years.

(*l*) A school of nuclear medicine technology whose approval has been terminated or has been withdrawn may apply for approval as a new school of nuclear medicine technology as provided in this subsection.

7:28–24.12 List of approved schools

A list of approved schools of nuclear medicine technology and their approval status shall be available from the Department, and may be obtained by contacting the Department. (See N.J.A.C. 7:28–24.8(b)2 for the Department's address.)

SUBCHAPTER 25 THROUGH 26. (RESERVED)

SUBCHAPTER 27. CERTIFICATION OF RADON TESTERS AND MITIGATORS

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.

1. Any person certified to perform radon measurement and/or mitigation who does not perform so in accordance with this subchapter shall be subject to the suspension and revocation provisions set forth in N.J.A.C. 7:28–27.25.

(e) A certified person shall conduct his or her activities in accordance with the approved certification and the provisions of the Act, this subchapter, and all other applicable municipal, county, state, and federal regulations and codes.

(f) A certified business shall submit to the Department, in writing, changes in the information provided in the original application including changes in client reporting forms, quality assurance/quality control plans, measurement or mitigation techniques 30 days prior to their use by the certified business. No fee is charged for such application amendments. The certified business shall also report to the Department, in writing, changes in certified personnel 14 days prior to their use.

(g) A person who wishes to be certified in any or all of the categories described in this subchapter, shall submit an application and the appropriate fee to the New Jersey Department of Environmental Protection, Division of Fiscal and Support Services, Bureau of Revenue, CN 402, Trenton, New Jersey, 08625, (609) 530–5767 prior to the Department issuing the approved certification. A person who wishes to add a category to an existing certification shall submit an application to the Bureau of Environmental Radiation, Radon Certification Program, New Jersey Department of Environmental Protection, CN 415, Trenton, New Jersey, 08625.

(h) A person shall be guilty of a crime of the third degree if he or she tests for or mitigates against radon/radon progeny in air unless he or she is certified for activities performed pursuant to N.J.A.C. 7:18 or this subchapter.

(i) Unless otherwise specified, any questions concerning the requirements of this subchapter and requests for application forms should be directed to the Bureau of Environmental Radiation, Radon Certification Program, New Jersey Department of Environmental Protection, CN 415, Trenton, New Jersey 08625, (609) 987–6396.

(j) It is the responsibility of the certified businesses to obtain the appropriate certificates, to maintain certified professionals in employment, to develop the quality assurance/quality control and radiological safety plan required by and in accordance with N.J.A.C. 7:28–27.33 and N.J.A.C. 7:28–27.34 and to report results of all measurement and/or mitigation activity to the Department.

7:28–27.4 Signatories

(a) All applicants shall, upon submission of initial or renewal applications, sign the following certification on the application forms:

1. "I certify under penalty of law that the information provided in this document is true, accurate and complete. I am aware that there are significant civil and criminal penalties for submitting false, inaccurate or incomplete information, including fines and/or imprisonment."

i. The certification set forth in (a)1 above shall be signed by the individual seeking certification and the highest ranking individual at the facility with overall responsibility for that facility.

2. "I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil and criminal penalties for submitting false, inaccurate or incomplete information, including the possibility of fine and/or imprisonment."

i. The certification required by (a)2 above shall be signed as follows:

(1) For a corporation, by a principal executive officer of at least the level of vice president;

(2) For a partnership or sole proprietorship, by a general partner or the proprietor, respectively; or

(3) For a municipality, State, Federal or other public agency, by either the principal executive officer or ranking elected official.

(b) In cases where the highest ranking corporate, partnership, or governmental officer or official at the facility as required in (a)1i above is the same person as the official required to certify in (a)2i, only the certification in (a)1 need be made. In all other cases, the certifications of (a)1 and 2 shall be completed.

(c) All signatures required by this section shall be notarized.

7:28–27.5 Certification requirements for radon measurement business

(a) A certified radon measurement business shall at all times maintain on staff or retain as a consultant a certified radon measurement specialist.

1. The certified radon measurement specialist shall direct the measurement activities of the measurement business and shall sign and be responsible for the review, approval, and verification of the reports required in N.J.A.C. 7:28–27.28.

2. The certified radon measurement specialist shall assess quality assurance and quality control measures of the measurement business, evaluate operating procedures, and ensure compliance with State and Federal regulations.

(b) Radon or radon progeny testing may only be performed by certified radon measurement specialists or certified radon measurement technicians.

1. Any person who wishes to test or analyze for radon in water must be certified pursuant to N.J.A.C. 7:18.

(c) The certified radon measurement business shall develop and adhere to a plan of quality assurance and quality control for each type of measurement equipment employed in order to assure the reliability and validity of radon measurements. Such plan shall contain the elements of N.J.A.C. 7:28–27.33, be submitted and approved by the Department and, at a minimum, include the requirements of the authorized measurement protocols.

(d) The certified radon measurement business shall develop and comply with a radiological safety plan designed to keep each employee's exposure to radon and radon progeny as low as reasonably achievable. Such plan shall be submitted and approved by the Department and include the requirements of N.J.A.C. 7:28–27.34.

(e) A certified radon measurement business shall secure the services of a certified radon laboratory certified pursuant to N.J.A.C. 7:18 to analyze samples for the presence and level of radon and/or radon progeny when the analysis requires the use of non-portable equipment in a facility separate from where the sample was taken.

(f) A certified radon measurement business which analyzes samples using non-portable equipment such as carbon canisters, alpha track detectors, or radon progeny integrated sampling units shall also be certified pursuant to N.J.A.C. 7:18.

(g) The use of portable radon or radon progeny measurement equipment such as a continuous radon monitor or a continuous working level monitor, does not require laboratory certification pursuant to N.J.A.C. 7:18.

(h) A certified radon measurement business shall have its Department radon certification number prominently displayed on each measurement device and/or package it utilizes.

(i) A certified radon measurement business shall at all times have on staff a certified radon measurement technician who has currently passed the authorized proficiency test required for initial and renewal certification.

1. In the case where a certified radon measurement business loses the services of the technician who passed the proficiency test, the business shall have no more than 45 days to either employ another technician who has passed the most recent proficiency test or have a currently employed technician take and pass a proficiency test.

i. In the case where no proficiency testing is available through an authorized proficiency program within the 45 day period, the certified radon measurement business shall be subject to the requirements of N.J.A.C. 7:28–27.6(a), 9iii, iv, and v.

7:28–27.6 Application requirements for a radon measurement business

(a) A person applying for certification as a radon measurement business shall submit the following information on forms provided by the Department:

1. The name, business location, address, and telephone number of the applicant;

2. The applicant's status as a corporation, company, association, society, firm, partnership, joint stock company or sole proprietorship;

3. The name and address of owners, officers, general and limited partners, directors, and principal shareholders;

4. For the persons listed in (a)3 above, the nature of any interest, financial or otherwise, in radon mitigation businesses or services;

5. For corporations, the state of domestic incorporation, and the names and principal places of business of any parent corporations of the applicant;

6. An identification of the type of radon and/or radon progeny measurement equipment for which certification is sought, as defined in the authorized measurement protocols;

7. An identification of the certified radon measurement specialists and certified radon measurement technicians employed by the business as staff members or consultants to be utilized by the applicant;

8. An identification of all instrumentation to be used in radon or radon progeny measurement: by manufacturer, model number, and serial number, or for non-portable measurement equipment, the analytical laboratory name, address, and relevant Department laboratory certification number;

9. Proof of successful completion of a proficiency test for each type of measurement equipment to be offered;

i. This requirement may be met by applicants who have devices such as carbon canisters, alpha track detectors, charcoal liquid scintillation, radon progeny integrating sampling units, and pump carbon radon grab samples or other devices analyzed by certified radon laboratories by submitting reports indicating that laboratory's successful completion of proficiency tests.

ii. Businesses which utilize portable instrumentation such as continuous working level monitors, continuous radon monitors, electret ion chambers, evacuated scintillation cells, pump-collapsible bag devices, flask grab samples, and radon progency grab samples shall participate in an authorized proficiency program and demonstrate proficiency for each type of equipment utilized.

iii. If an applicant, which utilizes portable instrumentation, submits proof that he or she has applied to an authorized proficiency program but testing will not be available within six months after he or she applied to the program, then the proficiency requirement is met provisionally, until the applicant takes and passes the next proficiency test, provided the applicant shows proof of at least two equipment/instrument calibrations during the six month period directly prior to applying for certification and all other requirements of this subchapter are fulfilled.

iv. If the applicant takes and does not pass the next proficiency test or does not take the next proficiency test, the provisional certification is void and he or she must re-apply for certification in accordance with the provisions of this subchapter.

v. If a proficiency test is not available during the provisional period, the final certification will be based on an on-site inspection of the business;

10. A copy of the quality assurance plan specified in N.J.A.C. 7:28–27.33;

11. A copy of the radiological safety plan specified in N.J.A.C. 7:28–27.34; and

12. A copy of all reporting forms used to report results to clients.

7:28–27.7 Certification requirements for a radon mitigation business

(a) The certified radon mitigation business shall employ as a staff member or consultant a certified radon mitigation specialist who shall be responsible for evaluating diagnostic tests in buildings and designing mitigation systems for those buildings.

(b) The certified radon mitigation business shall obtain all necessary permits for installation of mitigation systems from the appropriate construction code enforcing agency or other pertinent authorities prior to initiating any activity requiring the permit.

(c) The certified radon mitigation business shall assure that radon mitigation system installations are performed under the direct supervision of a certified radon mitigation specialist or certified radon mitigation technician.

(d) The certified radon mitigation specialist shall perform a visual inspection and diagnostic tests, as appropriate, prior to system installation to determine the appropriate mitigation system to be installed. Observations and test results made during inspections shall be documented by the specialist.

(e) The certified radon mitigation business shall provide all warranty information on the reduction of the radon level, and the proper functioning of mitigation equipment in writing to clients prior to installation of the system. When a business warrants a system, the warranty shall be honored and the precise coverage shall be explicitly stated in the contract offered to the client.

(f) The certified radon mitigation business shall have each building tested for radon levels before and after mitigation work is performed. Such tests shall be of comparable duration and sufficient type and consistency to allow for comparison of before and after mitigation radon levels, and shall be performed by a certified measurement business. The post mitigation test shall be started no sooner than 12 hours following mitigation.

(g) The mitigation system or material installed shall have been demonstrated to the Department to be effective in reducing radon levels in buildings or water supplies.

(h) The certified radon mitigation business, prior to commencing any work, shall provide the client, in writing, a description of any adverse effects produced by the operation of the mitigation system including a discussion of the possible types of energy costs to be incurred in operating the system. Immediately upon completion of the installation of the mitigation system, the certified radon mitigation business shall provide the client, in writing, instructions on the operation and maintenance of the system.

1. The certified radon mitigation business shall also affix a statement on the installed equipment. This statement shall disclose the purpose and correct operating and maintenance procedures of the system.

(i) The certified radon mitigation business shall develop and adhere to a radiological safety plan submitted and approved by the Department designed to keep each employee's exposure to radon as low as is reasonably achievable. Such plan shall, at a minimum, include the requirements in N.J.A.C. 7:28–27.34.

7:28–27.8 Application requirements for radon mitigation business

(a) A person applying for certification as a radon mitigation business shall submit the following information on forms provided by the Department:

1. The name, business location, address, and telephone number of the applicant;

2. The applicant's status as a corporation, company, association, society, firm, partnership, joint stock company or sole proprietorship;

3. The names and addresses of owners, officers, general and limited partners, directors, and the principal shareholders;

4. For the persons listed in (a)3 above, the nature of any interests, financial or otherwise, in radon measurement businesses or services;

5. For corporations, the state of domestic incorporation and the names and principal places of business of the parent corporation of any applicant;

6. A description of all mitigation systems offered, and types of diagnostic evaluations performed;

i. Proof that the systems and the diagnostic evaluations offered have been effective in reducing radon levels;

7. An identification of the certified radon mitigation specialists and the certified radon mitigation technicians employed by the business as staff or consultants to be utilized by the business;

8. An identification of the certified radon measurement businesses to be utilized by the certified radon mitigation business to perform radon and/or radon progeny testing prior to and following the radon mitigation;

9. An identification of all procedures and instrumentation used in performing diagnostic tests;

10. A copy of the forms to be used when reporting to the client; and

11. A copy of the radiological safety plan meeting, at a minimum, the requirements specified in N.J.A.C. 7:28–27.34.

7:28–27.9 Certification requirements for radon measurement specialists

(a) Prior to applying for certification as a radon measurement specialist:

1. An applicant shall possess a Bachelor's degree from an accredited institution in biological sciences, chemistry, physics, geology, or other natural science or engineering and at least one year of radiation work experience.

i. Persons currently certified in the United States as a Certified Health Physicist are considered to have met the degree requirements and radiation experience of this section.

ii. Radiation work experience shall include documentable experience in two or more of the following areas:

(1) Establishment and/or evaluation of a radiation protection program;

(2) Design and/or the evaluation of the design of the radiation protection aspects of a facility;

(3) Design and implementation of a radiation protection training course or program;

(4) Development of an experimental and/or measurement program designed to answer questions related to radiation protection;

(5) Evaluation of measurement data;

(6) Analysis and solution of radiation protection problems; and

(7) Preparation, interpretation, and implementation of recommendations and regulations.

2. An applicant shall have at least six months of measurement work experience within the State or in a reciprocal agreement state administering radon and/or radon progeny measurement activities and evaluating the results of radon tests;

3. An applicant shall have successfully completed a course or seminar consisting of at least 24 hours of training approved by the Department, covering radiation with emphasis on radon; and

4. An applicant shall pass a written examination offered or approved by the Department.

(b) Certification as a radon measurement specialist qualifies a person as a certified radon measurement technician.

(c) If a certified radon measurement specialist wishes to function as a measurement business, he or she must be certified as a radon measurement business.

7:28–27.10 Application requirements for radon measurement specialists

(a) A person applying for certification as a radon measurement specialist shall submit the following information on forms provided by the Department:

1. The name, address, and telephone number of the applicant;

2. Proof, such as a certified true copy of a transcript, showing that he or she holds a bachelor's degree from an accredited institution in a natural science or engineering;

3. Proof of at least one year of radiation work experience;

4. Proof of at least six months of measurement work experience within the State or in a reciprocal agreement state;

5. Proof that he or she has successfully completed a Department approved course with emphasis on radon;

6. Proof of passing a written examination offered or approved by the Department; and

7. A list of all certified radon measurement businesses for which the applicant will be a certified radon measurement specialist.

7:28–27.27 Request for adjudicatory hearing

(a) Within 20 calendar days from receipt of a certification denial, refusal to renew or revocation issued by the Department pursuant to N.J.A.C. 7:28–27.25, the applicant may request an adjudicatory hearing to contest such action by submitting a written request to the Department which shall include the following information:

1. Name, address, and telephone number of the applicant;

2. Identification of the applicant's certification category, that is, radon measurement business, specialist, or technician or radon mitigation business, specialist, or technician;

3. The applicant's factual position on each question alleged to be at issue, its relevance to the Department's decision, specific reference to the contested conditions as well as suggested or revised or alternative conditions;

4. Information supporting the applicant's factual position and proposed conditions and a copy of other written documents relied upon to support the request for a hearing;

5. An estimate of the time required for the hearing (in days and/or hours); and

6. A request if necessary for a barrier free hearing location for disabled persons.

(b) A hearing request not received within 20 days after receipt by the applicant of a certification denial or revocation issued by the Department pursuant to N.J.A.C. 7:28–27.25, shall be denied by the Department.

(c) If the applicant fails to include all of the information required by (a) above, the Department may deny the hearing request.

(d) If it grants the request for a hearing, the Department shall file the request for a hearing with the Office of Administrative Law. The hearing shall be held in accordance with the Administrative Procedure Act, N.J.S.A. 52:14B–1 et seq., and the Uniform Administrative Procedure Rules, N.J.A.C. 1:1.

7:28–27.28 Reporting requirements

(a) A certified radon measurement business shall submit to the Department by the first day of each month the results of all radon and radon progeny measurements performed during the second previous month. For example, the results from May testing are to be submitted July 1. Data shall be submitted in the format and the media required by the Department. For each test conducted, this data shall include, but not necessarily be limited to:

1. Name of owner and resident, street address, municipality, county and zip code of location where testing was performed;

2. The type of equipment used for radon and/or radon decay product testing according to the authorized measurement protocols, media tested, and conditions under which testing was performed;

3. The level or floor of the building where tests were conducted;

4. The results of the test in picocuries/liter (pCi/l) of radon gas or working level (WL) of radon decay products;

5. The date and start and completion times when the test was conducted;

6. The purpose of the test, for example, screening, follow-up, diagnostics, pre-mitigation, post-mitigation;

7. The certified radon laboratory performing analysis of the sample devices;

8. The type of building the test was performed in: residential or non-residential;

9. Who performed the sampling: building owner or certified radon professional; and

10. Whether the test was conducted as part of a real estate transaction.

(b) The certified radon measurement business shall report test results for radon and radon progeny directly to the owner of the building and the Department. Radon results shall be reported in picocuries per liter (pCi/l), decay product results shall be reported in working levels (WL). The report provided to the owner shall include the following statements:

"This notice is provided to you by an organization or individual certified by the New Jersey Department of Environmental Protection to perform radon and/or radon progeny measurements. N.J.S.A. 26:2D–73 requires that no certified person disclose to any individual, except the Department of Environmental Protection or the Department of Health the address or owner of a nonpublic building that the person has tested or treated for the presence of radon gas and radon progeny, unless the owner of the building waives, in writing, this right of confidentiality. In the case of a prospective sale of a building which has been tested for radon gas and/or radon progeny, the seller shall provide the buyer, at the time the contract of sale is entered into, with a copy of the results of that test and evidence of any subsequent mitigation or treatment, and any prospective buyer who contracts for the testing shall have the right to receive the results of that testing. Any questions, comments, or complaints regarding the persons performing these measurements, or related mitigation, or safeguarding services should be directed to the New Jersey Department of Environmental Protection. Attention: Radon Section, Bureau of Environmental Radiation (1–800–648–0394)."

1. Notwithstanding other remedies available to the Department, a person shall be guilty of a crime of the third degree for reporting radon/radon progeny test results to any person other than the owner of the building tested, the Department or, in the case of a prospective sale, the buyer who contracts for the testing.

(c) A certified radon measurement business and certified radon mitigation business, prior to any mitigation work, shall provide to each client or his/her a copy of the most recent version of the Department's publication titled "Guidance on Performing Screening and Follow-up Measurement Tests."

(d) A certified radon measurement business shall clearly identify to his or her clients the certified radon laboratory used, if any, to analyze the devices. The certified radon measurement business may either send a copy of the original laboratory results to the client or clearly state next to the results reported to the client, the name of the certified radon laboratory and its Department certification number.

(e) A radon mitigation business shall submit to the Department by the first day of each month a report on all mitigation work performed during the second previous month. Reports shall be submitted on forms provided by the Department and shall include at a minimum:

1. The name and address of the owner and resident of the building in which mitigation work was performed and the type of building that was mitigated, either residential or non-residential;

2. A description of the mitigation work performed in each building, specifying the type of mitigation systems installed and the date of installation;

3. All pre- and post-mitigation radon test results, test dates, methods of measurements, and level of building on which tests were performed and the name of the certified measurement business performing tests; and

4. The certified radon mitigation business shall include in all mitigation contracts the following statement:

"This notice is provided to you by an organization or individual certified by the New Jersey Department of Environmental Protection to perform radon mitigation or safeguarding services.

At some time in the near future, a representative of the Department of Environmental Protection may contact you to ask your permission to visit your building. The purpose of this visit would be to inspect the recently installed mitigation system.

Any questions, comments or complaints regarding the persons performing these mitigation or safeguarding services should be directed to the New Jersey Department of Environmental Protection, Attention: Radon Projects Section, Bureau of Environmental Radiation (1–800–648–0394)."

(f) The certified radon mitigation business shall include in all mitigation contracts a statement on the possible adverse side effects produced by the operation of the proposed mitigation system. This statement shall include a discussion of the possible types of energy costs incurred in operating the system.

7:28–27.29 Liability of certified radon measurement or radon mitigation business for actions of employees

Notwithstanding the responsibility of any other person or the exemption from the provisions of any other section of this subchapter, any certified radon measurement or radon mitigation business shall be responsible for any violation of the Act committed by an employee in the scope of his or her employment. This responsibility shall be joint and several.

7:28–27.30 Fees

(a) All persons wishing to become certified or renew their certification shall submit to the Department a non-refundable application fee and annual application renewal fee in accordance with Certification Fee Schedule A below.

(b) All persons taking the certification examination shall submit a non-refundable examination fee in accordance with Certification Fee Schedule A below.

(c) All persons taking a course offered by the Department shall submit a non-refundable course fee in accordance with Certification Fee Schedule A below.

(d) In addition to the fees in Schedule A, a program administration fee shall be submitted to the Department by a certified radon measurement business in accordance with Fee Schedule B below.

(e) In addition to the fees in Schedule A, a program administrative fee shall be submitted to the Department by a certified radon mitigation business in accordance with Fee Schedule C below.

(f) Fees specified in (d) and (e) above shall be submitted semi-annually to the Department at the address specified on the certification application.

(g) The above fees shall be used to cover the cost of Department implementation of the certification provisions of this subchapter.

8. A description of procedures for calibration and maintenance of portable instruments including:

i. The calibration equipment and procedures used for both pumps and measurement equipment, and formulas for calculating calibration factors;

ii. The frequency at which calibrations of each piece of equipment, both pumps and measurement, are performed shall be given. Said calibrations of equipment, both pumps and measurement, shall occur at least twice a year;

iii. The calibration standards or sources used and their traceability. Include whether calibrations are performed in a radon chamber and/or by other methods; and

iv. Equipment maintenance procedures;

9. A description of internal quality control procedures for portable instruments;

10. Data reduction and reporting procedures including:

i. The data reduction scheme planned for all analytical data from portable instruments;

ii. Methods used to identify and treat anomalous data; and

iii. The names or positions of key individuals who will handle data and be responsible for reporting results to clients and maintaining appropriate confidentiality;

11. Corrective action procedures including:

i. The predetermined limits for data acceptability beyond which corrective action is necessary;

ii. The corrective action to be taken; and

iii. The names or positions of individuals responsible for initiating and approving the corrective actions; and

12. A brief description of the quality assurance reports that will be submitted to the businesses' management including:

i. The periodic assessment of measurement accuracy and precision;

ii. Results of intercomparisons and calibrations;

iii. The results of any internal or external audits; and

iv. All significant quality assurance/quality control problems encountered and recommended solutions.

7:28–27.34 Minimum requirements for radiological safety plans

(a) All new employees or consultants of a certified radon measurement business or certified radon mitigation business who will be entering structures with unknown radon levels or radon levels above four picocuries per liter (pCi/l) for purposes of radon or radon progeny measurement, or designing, installing or repairing radon mitigation systems shall be instructed by the certified radon measurement specialist or certified radon mitigation specialist of the business on proper radiation safety practices prior to entering such a structure, in accordance with the businesses' radiological safety plan. Each new employee shall be required to take and pass a test on radiation safety developed by the certified radon measurement or certified radon mitigation specialist. The passing level of the test shall be determined by the certified radon measurement or mitigation specialist.

(b) The certified radon measurement or certified radon mitigation business is responsible for the radiological safety of all their employees.

(c) Refresher radiation safety training of workers shall be conducted at a minimum of once annually.

(d) At a minimum, the practices identified below shall be followed by all radon testers and mitigation workers entering buildings where the radon level is unknown or above 4 pCi/l.

1. For radon testing:

i. Limit the amount of time spent in elevated radon areas, for example, basements, crawl spaces;

ii. Respond to questions or concerns of clients in a low radon area, for example, upper floors or patios during field visits;

iii. Analyze samples in a low radon area. An exception would be those cases in which continuous real time monitoring is used to monitor mitigation system performance or to alert workers to the presence of high radon levels; and

iv. Calibrate/set up radon testing equipment prior to entering an elevated radon area.

2. For radon mitigation work:

i. The pre-mitigation radon test result from the building in which a mitigation system is being installed shall be made known to all mitigation workers by the certified radon mitigation specialist prior to beginning mitigation work. The radon or radon progeny level from this test shall be entered on the Radon Exposure Tracking Form specified in (n) below;

ii. Building areas where mitigation work is being performed shall be ventilated during the work period to the extent practicable;

iii. The time spent in areas with potentially high radon concentrations, for example, crawl spaces, and other confined spaces should be limited, to the extent consistent with performing diagnostic work;

iv. Work breaks/lunches shall not be taken in elevated radon areas;

v. Exhaust gases from subslab suction systems shall be vented outdoors, preferably above roof eaves and away from potentially occupied areas;

vi. Only the number of persons necessary to carry out mitigation work shall be present in the building being mitigated; and

vii. Smoking by employees shall not be permitted in buildings being mitigated.

(e) Each certified radon measurement and mitigation specialist and technician shall track their exposure to radon progeny if a potential for exposure exceeds one working level month per year (WLM/year). This may be done by wearing a passive long term, meaning greater than three months, radon detector during work periods or keeping records in accordance with the Radon Exposure Tracking Form set forth in (*o*) below.

(f) The certified radon mitigation specialist or certified radon measurement specialist shall be responsible for tracking exposures of workers utilized by the business if there is potential for exceeding one WLM/year exposure.

(g) The certified radon mitigation specialist or certified radon measurement specialist shall review exposures on a quarterly basis and compute estimated exposures for each person cited in (e) and (f) above. Annual cumulative exposures shall also be estimated.

(h) Individual workers with estimated work related exposures exceeding two WLM/year shall not be assigned mitigation work in higher radon level buildings on a continuing basis.

(i) The certified radon mitigation specialist shall notify workers in writing of estimated exposures quarterly. At any time when estimated exposure of a worker could potentially exceed four WLM/year, an investigation shall be conducted and actions shall be taken to reduce exposure to the worker.

(j) No employee shall be permitted to receive exposure from inhalation of radon progeny in excess of four WLM/year in one calendar year.

(k) Exposure records shall be maintained by the business for each worker exposed to elevated radon levels, on a continuing basis. Cumulative exposures for each quarter and each year of employment shall be recorded.

(*l*) Records of worker radiation safety training and annual refresher courses shall be maintained by the business during and at least one year after the employee terminates his or her employment. These records shall include date of training, instructor, length of session, and topics covered.

(m) Records which indicate each employee's performance on the radiation safety test shall be maintained by the business along with copies of the test which was given.

(n) Safety records shall be available for inspection by the Department during normal business hours at the place of business.

(*o*) RADON EXPOSURE TRACKING FORM

DATE OF MEASUREMENT	RADON/RADON PROGENY LEVEL (pCi/l or WL)	DATE OF EXPOSURE	TIME EXPOSED (HRS)	VENTILATION CONDITIONS DURING EXPOSURE (windows open/fan/closed house)

7:28–27.35 Temporary certification

(a) The Department may allow for a radon measurement business, N.J.A.C. 7:28–27.5 and 6, and a radon mitigation business, N.J.A.C. 7:28–27.7 and 8, a temporary certification for up to one year if that business is listed, as of January 1, 1990, on the Department's list of approved radon testing and mitigation firms, the firm submits a complete application for certification within 90 days (January 13, 1991) of the date of adoption of this subchapter, and the firm submits proof that it employs certified individuals.

(b) The period of temporary certification shall start at the end of the 90 day period and extend for one year, or until the Department completes its review of the application and approves or denies a certification or provisional certification in accordance with the requirements of this subchapter, whichever occurs sooner.

(c) To receive a temporary certification pursuant to (a) above, an applicant must agree, in writing, to cease any radon measurement or mitigation activity without prior hearing if so instructed by the Department at any time during the period of temporary certification. The applicant must further acknowledge its understanding that this temporary certification confers on it no permanent rights to operate a radon measurement or mitigation business and agrees to cease any radon measurement or mitigation activity upon expiration of the temporary certification or when the application for full or provisional certification is denied.

SUBCHAPTERS 28 THROUGH 40. (RESERVED)

SUBCHAPTER 41. MERCURY VAPOR LAMPS

7:28–41.1 Purpose and scope

This subchapter applies to indoor and outdoor facilities using mercury vapor lamps for illumination and establishes safety requirements for their use.

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

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.

"Dispose" or "disposal" means the discarding or destroying of a nonionizing radiation producing source.

"Gigahertz" (GHz) means 1,000,000,000 hertz or cycles per second.

"Kilohertz" (kHz) means 1,000 hertz or cycles per second.

"Megahertz" (MHz) means 1,000,000 hertz or cycles per second.

"Microwave heater, sealer and industrial oven" means any source which uses microwave radiation between the frequencies of 300 MHz and 100 GHz to heat, melt, dry, cure, sanitize, disinfect or alter the chemical composition of materials such as, but not limited to, plastics, rubber, glue, wood, dyes or food.

"Microwave radiation" means, for the purposes of this subchapter, nonionizing radiation between the frequencies of 300 MHz and 100 GHz. (By convention, microwave radiation describes all the frequencies between 300 MHz and 300 GHz. Microwave radiation is a subset of the radiofrequency radiation spectrum.)

"Nonionizing radiation" means radiation which does not have the capability of ionizing the medium through which it is passing.

"Nonionizing radiation producing source" or "source" means, for the purposes of this subchapter, any equipment, machine or device capable of emitting nonionizing radiation between the frequencies of 300 kHz and 100 GHz.

"Owner" means a person who has title to a radiation source or who possesses a radiation source as a lessee, bailee or pursuant to the terms of a registration issued by the Department, by a Federal agency, or by any other state.

"Person" includes an individual, corporation, partnership, firm, association, trust, estate, public or private institution, group, municipality, any state or other legal entity; and any legal successor, representative agent, or agency of the foregoing.

"Radiation Assessment Document" means a form or series of forms issued by the Department requiring information such as, but not limited to, radiation frequency, duty cycle of each source, the source operator's position in relation to each source and any additional information which will be used to predict radiation levels in the areas surrounding nonionizing radiation producing sources.

"Radiofrequency radiation" means, for the purposes of this subchapter, nonionizing radiation between the frequencies of 300 kHz and 100 GHz. (By convention, radiofrequency radiation described all the frequencies below 300 GHz, with microwave radiation as a subset of the radiofrequency radiation spectrum.)

"Radiofrequency heater and sealer" means any source, including induction and dielectric heaters, which uses radiofrequency radiation between the frequencies of 300 kHz and 299 MHz to heat, melt, dry, cure, sanitize, disinfect or alter the chemical composition of materials such as, but not limited to, plastics, rubber, glue, wood, dyes or food.

"Registration" means the submission by the owner and receipt by the Department of the completed registration form and Radiation Assessment Document, and the payment of fees.

"Transferee" means a person who obtains either:

1. Ownership of a nonionizing radiation producing source; or

2. A controlling interest in the owner of such a source.

"Transferor" means a person who sells or otherwise transfers either:

1. A nonionizing radiation producing source; or

2. A controlling interest in the owner of such a source.

7:28–48.3 Registration of a nonionizing radiation producing source

(a) (Reserved)

(b) No owner shall operate a nonionizing radiation producing source listed in (b)1 or 2 below unless the owner completes the registration form and it is received by the Department by March 4, 1995. Thereafter, no owner shall operate the sources listed in (b)1 or 2 below unless the owner completes the registration form and it is received by the Department 30 calendar days after the owner takes possession of any of the sources listed below:

1. Radiofrequency heaters and sealers; or

2. Microwave heaters, sealers and industrial ovens.

(c) An owner shall register on forms made available by the Department. The registration form shall include the following information:

1. The owner's name, address and telephone number;

2. The type of source(s);

3. The number of source(s);

4. The location of source(s);

5. The frequency or frequency range of radiation emitted from each source; and

6. Any additional information which is reasonably necessary to identify the source or the owner of the source.

(d) An owner shall produce immediately, upon request by the Department, a copy of the completed registration form.

(e) If an owner of a nonionizing radiation producing source fails to register that source with the Department, and the Department has reason to believe that the source is a radiofrequency or microwave heater, sealer, or industrial oven, the Department may require the owner to provide information on the source and may conduct an inspection of the source, facility and any documents or records pertaining thereto.

7:28–48.4 Amendments to the registration of a nonionizing radiation producing source

An owner shall notify the Department in writing within 30 calendar days of any change in the information on the registration form.

7:28–48.5 Radiation Assessment Document

(a) An owner shall submit to the Department a Radiation Assessment Document, on forms made available by the Department, no later than 60 calendar days after the owner's receipt of the bill for the initial registration fee.

(b) (Reserved)

(c) For sources listed in N.J.A.C. 7:28–48.3(b), the Radiation Assessment Document shall include the following information:

1. The owner's name, address and telephone number;
2. The type of source(s);
3. The number of source(s);
4. The location of each source;
5. The frequency or frequency range of radiation emitted from each source;
6. The duty cycle of each source;
7. The source operator's position in relation to each source; and
8. Any additional information which is reasonably necessary to assess compliance of the sources with the provisions of N.J.A.C. 7:28–42.

7:28–48.6 Amendments to Radiation Assessment Documents

An owner shall notify the Department in writing within 30 calendar days of any change in the information contained in the Radiation Assessment Document.

7:28–48.7 Initial registration fee and annual renewal fee for nonionizing radiation producing sources

(a) An owner shall remit to the Department the initial registration fee or annual renewal fee no later than 30 calendar days after the owner's receipt of the bill issued by the Department.

(b) An owner shall pay the fees for initial registration and annual renewal as follows:

Source Category	Initial Registration Fee	Annual Renewal Fee
1. Radiofrequency heaters and sealers, per location		
One source	$ 180.00	$160.00
Two sources	305.00	285.00
Three sources	415.00	395.00
Four sources	565.00	545.00
Five sources	675.00	650.00
Six sources	795.00	770.00
Seven sources	910.00	890.00
Eight sources	1,010.00	990.00
For each additional source at the same location, add:	90.00	90.00
2. Microwave heaters, sealers and industrial ovens, per location		
One source	$ 125.00	$125.00
Two sources	220.00	225.00
Three sources	325.00	330.00
Four sources	415.00	425.00
Five sources	505.00	520.00
Six sources	600.00	615.00
Seven sources	705.00	725.00
Eight sources	805.00	830.00
For each additional source at the same location, add:	80.00	85.00

(c) An owner remitting an initial registration fee or annual renewal fee shall mail a check or money order, payable to "Treasurer, State of New Jersey," to the Department at the following address:

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

(d) An owner who fails to remit the initial registration fee or annual renewal fee within 30 calendar days after the owner's receipt of the bill shall be assessed a late charge, which is 20 percent of the amount of the billed fee.

(e) The registration of an owner who fails to submit an annual renewal fee within 60 calendar days after the owner's receipt of the bill shall be considered expired.

1. Any owner whose registration has expired pursuant to this subsection shall, upon a written request transmitted to the Department within 30 calendar days of the expiration of the registration, be afforded the opportunity for a hearing thereon in the manner provided for contested cases pursuant to the Administrative Procedure Act, N.J.S.A. 52:14B–1 et seq., and the Uniform Administrative Procedure Rules, N.J.A.C. 1:1.

2. Requests for hearings shall be sent to the Office of Legal Affairs, ATTENTION: Adjudicatory Hearing Requests, Department of Environmental Protection, CN 402, Trenton, NJ 08625–0402.

(f) An owner who allows the registration of a source to expire by failing to remit the annual renewal fee within 60 calendar days after the owner's receipt of the bill shall be required to file a new registration form along with the appropriate initial registration fee listed in (b) above.

(g) Fees submitted to the Department are not refundable.

Administrative Correction.
See: 27 N.J.R. 498(b).

7:28–48.8 Sale of a nonionizing radiation producing source or transfer of a controlling interest; termination of registration upon sale of nonionizing radiation producing source or upon transfer of controlling interest

(a) A person who sells or otherwise transfers either a nonionizing radiation producing source, or a controlling interest in the owner of such a source, shall notify the Department in writing at least 30 calendar days before the sale or transfer occurs. The transferor shall include the following information in the notice:

1. The name and address of the transferee; and

2. The date of the proposed sale or transfer.

(b) Unless the procedures set forth in either (c) or (d) below are followed, the registration of a nonionizing radiation producing source shall terminate upon the sale of the source or upon the transfer of a controlling interest in the person who owns the source.

(c) The registration of a nonionizing radiation producing source shall not terminate upon the sale of the source or upon the transfer of a controlling interest under (b) above, and shall be transferred to the transferee, if the transferee certifies to the Department in writing that it will assume all of the transferor's liabilities in connection with:

1. Any deficiencies in the operation of source that would result in a violation of any of the provisions of N.J.A.C. 7:28–42; and

2. All penalties arising in connection with the source from occurrences or circumstances existing before the date of the sale or transfer.

(d) The registration of a nonionizing radiation producing source shall not terminate upon the sale of the source or upon the transfer of a controlling interest under (b) above, if the transferor takes the actions required of the transferor under the following procedure:

1. The transferor shall notify the Department in writing of the proposed sale or transfer, prior to the sale or transfer in accordance with (a) above;

2. The Department may, in its discretion, perform an onsite audit of the nonionizing radiation producing source. If the Department performs such an audit, it shall be completed within 90 calendar days after receipt of notice under (d)1 above;

3. Within 45 calendar days after the deadline for completion of the audit in (d)2 above, based on the audit and/or a review of Department records, the Department shall either:

i. Issue to the transferor a notice stating that there are no deficiencies in the operations of the nonionizing radiation producing source and that no violations exist; or

ii. Issue to the transferor a report of all deficiencies and one or more notices of prosecutions or administrative orders; and

4. The transferor corrects all deficiencies and pays all the penalties noted in (d)3 above.

(e) If the registration of a nonionizing radiation producing source continues pursuant to the procedures set forth in either (c) or (d) above, the transferee shall operate its nonionizing radiation producing source in compliance with this subchapter and all applicable provisions of this chapter.

(f) If the registration of a nonionizing radiation producing source terminates pursuant to (b) above, the transferee shall submit an initial registration form and the appropriate initial registration fee within 30 calendar days after it takes possession of the nonionizing radiation producing source or assumes a controlling interest in the owner of such a source, unless it is the intent of the transferee to dispose of the source. If the transferee operates the nonionizing radiation producing source before it submits the completed initial registration form, the transferee shall be in violation of N.J.A.C. 7:28–48.3.

7:28–48.9 Disposal of a nonionizing radiation producing source

(a) Whenever an owner disposes of a nonionizing radiation producing source, as listed in N.J.A.C. 7:28–48.3(a) and (b), the owner shall give written notification to the Department within 30 calendar days after such disposal. The owner shall provide to the Department a complete description of the final disposition of the source.

(b) The registration of a nonionizing radiation producing source shall terminate upon the disposal of the source.

7:28–48.10 Exemption from registration and payment of initial registration fee and annual renewal fee

(a) An owner of a nonionizing radiation producing source is exempt from registration and payment of initial registration and annual renewal fees if:

1. The source is not operational, and does not emit nonionizing radiation;

2. (Reserved)

3. (Reserved)

4. The source is used for display purposes only, and does not emit nonionizing radiation;

5. The source is possessed, used or stored by the United States Government; or

6. The source is a microwave oven used to cook food for customers' consumption in locations such as, but not limited to, restaurants, canteens, and other eating establishments, or a microwave oven purchased by a consumer for use in the home.