

NEBRASKA DEPARTMENT OF HEALTH AND HUMAN SERVICES
NOTICE OF PUBLIC HEARING

December 13, 2019
10:00 a.m. Central Time
Nebraska State Office Building – Lower Level B
301 Centennial Mall South, Lincoln, Nebraska

The purpose of this hearing is to receive comments on proposed changes to Title 180, Chapter 15 of the Nebraska Administrative Code (NAC) – *Training and Experience Requirements for Use of Radiation Sources*. The chapter outlines the training and experience requirements for utilizing or servicing sources of radiation. The proposed changes modify the training requirements for persons installing or repairing radiation generating equipment; remove duplicative statutory language and unnecessary language from the regulations; and update formatting.

Authority for these regulations is found in Neb. Rev. Stat. § 81-3117(7).

Interested persons may attend the hearing and provide verbal or written comments or mail, fax or email written comments, no later than the day of the hearing to: DHHS Legal Services, PO Box 95026, Lincoln, NE 68509-5026, (402) 742-2382 or dhhs.regulations@nebraska.gov, respectively.

A copy of the proposed changes is available online at <http://www.sos.ne.gov>, or by contacting DHHS at the mailing address or email above, or by phone at (402) 471-8417. The fiscal impact statement for these proposed changes may be obtained at the office of the Secretary of State, Regulations Division, 1201 N Street, Suite 120, Lincoln, NE 68508, or by calling (402) 471-2385.

Auxiliary aids or reasonable accommodations needed to participate in a hearing can be requested by calling (402) 471-8417. Individuals with hearing impairments may call DHHS at (402) 471-9570 (voice and TDD) or the Nebraska Relay System at 711 or (800) 833-7352 TDD at least 2 weeks prior to the hearing.

FISCAL IMPACT STATEMENT

Agency: Department of Health and Human Services	
Title: 180	Prepared by: Julia Schmitt
Chapter: 15	Date prepared: 5/22/2019
Subject: Training and Experience Requirements for Use of Radiation Sources	Telephone: 402/471-0528

Type of Fiscal Impact:

	State Agency	Political Sub.	Regulated Public
No Fiscal Impact	(<input checked="" type="checkbox"/>)	(<input checked="" type="checkbox"/>)	(<input checked="" type="checkbox"/>)
Increased Costs	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)
Decreased Costs	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)
Increased Revenue	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)
Decreased Revenue	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)
Indeterminable	(<input type="checkbox"/>)	(<input type="checkbox"/>)	(<input type="checkbox"/>)

Provide an Estimated Cost & Description of Impact:

State Agency:

Political Subdivision:

Regulated Public:

If indeterminable, explain why:

TITLE 180 CONTROL OF RADIATION

CHAPTER 15 TRAINING AND EXPERIENCE REQUIREMENTS FOR USE OF
RADIATION SOURCES

001. SCOPE AND AUTHORITY. This chapter establishes the training and experience requirements of personnel utilizing or servicing sources of radiation addressed in 180 Nebraska Administrative Code (NAC) 2, 3, 5, 6, 8, 9, 12 and 20. It establishes the criteria which courses of instruction must possess prior to being approved by the Department. Title 180 is authorized by and implements the Nebraska Radiation Control Act, Nebraska Revised Statute (Neb. Rev. Stat.) §§ 71-3501 to 71-3520.

002. DEFINITIONS. The following definitions apply to 180 NAC 15.

002.01 EXPERIENCE. Active participation in events or activities, leading to accumulation of knowledge is experience.

002.02 FORMAL TRAINING. Training or education, including either didactic or clinical practicum or both, which has a specified objective, planned activities for students, and suitable methods for measuring student attainment, and which is offered, sponsored, or approved by an organization or institution which is able to meet or enforce these criteria is formal training.

003. RECENTNESS OF TRAINING. The training and experience specified in 180 NAC 15 must have been obtained within the seven years preceding the date of application or the individual must have related continuing education and experience since the required training and experience was completed.

004. MINIMUM QUALIFICATIONS. This section addresses the qualifications for a radiological medical physicist, a radiological health physicist, and a qualified expert.

004.01 RADIOLOGICAL MEDICAL PHYSICIST. A radiological medical physicist must:

- (A) Be certified by the American Board of Radiology in therapeutic radiological physics, roentgen ray and gamma ray physics, x-ray and radium physics; or radiological physics; or the American Board of Medical Physics in radiation oncology physics or the Canadian College of Medical Physics. Certification must be in the specialty the individual will be clinically practicing; or
- (B) Have a master's or doctor's degree in physics, medical physics, other physical science, engineering, applied mathematics, nuclear physics, biophysics, radiological physics, or health physics and has completed one year of full time training in medical physics and an additional year of full time work experience under the supervision of

a radiological medical physicist that meets the requirements of 180 NAC 15-004.01(A) at a medical institution. Full time training and full time work experience must be in the specialty the individual will be clinically practicing.

004.02 RADIOLOGICAL HEALTH PHYSICIST. A radiological health physicist must:

- (A) Be certified by the American Board of Health Physics or the American Board of Radiology in therapeutic radiological physics, roentgen ray and gamma ray physics, x-ray and radium physics, or radiological physics, diagnostic radiologic physics; or the American Board of Medical Physics, or the Canadian College of Medical Physics;
- (B) Have a master's or a doctor's degree in a physical or natural science or equivalent, biophysics, radiological physics or health physics, plus one year of full time experience in radiation protection and measurements; or
- (C) Have a bachelor's degree in a physical or natural science or equivalent, plus three years of full time training and experience in radiation protection and measurements and a written statement from a radiological health physicist as defined in 180 NAC 15-004.02(A) or (B) that two years of training and experience in radiation protection and measurements, including knowledge and training in the field of radiation shielding, have been obtained under their supervision.

004.03 QUALIFIED EXPERT. A qualified expert must have:

- (A) A bachelor's degree in a physical or natural science, and one year of experience in radiation protection and measurements; or
- (B) A certificate or associate degree from an accredited radiological technology school and one year of experience in radiation protection and measurements.

005. TRAINING AND EXPERIENCE REQUIREMENTS FOR PERSONNEL FOR INSTITUTIONAL BROAD SCOPE TYPE LICENSE A, B, AND C LISTED IN 180 NAC 3-013. This section addresses the training and experience requirements of personnel using radioactive material under a broad scope license.

005.01 RADIATION SAFETY OFFICER. A radiation safety officer must have:

- (A) A college degree at the bachelor level, in physical or biological sciences or in engineering plus four years work experience in health physics, radiological health or another field equivalent to the above fields; or
- (B) A master's degree or equivalent graduate coursework in health physics or radiological health with two years of work experience in health physics or radiological health.

005.02 AUTHORIZED USER. An authorized user must have:

- (A) A college degree at the bachelor level, or equivalent training or experience in the physical or biological sciences or in engineering;
- (B) 40 hours of formal instruction in:
 - (i) Radiation physics and instrumentation;
 - (ii) Radiation protection;
 - (iii) Mathematics pertaining to the use and measurement of radioactivity; and
 - (iv) Biological effects of radiation; and
- (C) One-hundred and sixty hours experience in the safe handling of radioactive material.

006. PERSONNEL TRAINING AND EXPERIENCE REQUIREMENTS FOR LICENSEES IN AN EDUCATIONAL INSTITUTION OTHER THAN BROAD SCOPE LICENSES. This section addresses training and experience requirements for personnel using radioactive material at an educational institution that has a license other than broad scope license.

006.01 RADIATION SAFETY OFFICER, AUTHORIZED USER, OR BOTH. A radiation safety officer, authorized user, or both must:

- (A) Have a college degree at the bachelor level, or equivalent training and experience in the physical or biological sciences or in engineering;
- (B) Have 40 hours of formal instruction in:
 - (i) Radiation physics and instrumentation;
 - (ii) Radiation protection;
 - (iii) Mathematics pertaining to the use and measurement of radioactivity; and
 - (iv) Biological effects of radiation; and
- (C) Demonstrate an understanding of institution radiation safety policy and procedures and applicable parts of Title 180 or its equivalent.

007. TRAINING AND EXPERIENCE REQUIREMENTS FOR LABORATORY AND INDUSTRIAL USE OF RADIOACTIVE MATERIAL PERSONNEL. Personnel using radioactive material under laboratory or industrial licenses must meet the following requirements.

007.01 MILLICURIE QUANTITIES. For use of millicurie quantities, the radiation safety officer, authorized user, or both must:

- (A) Have a college degree at the bachelor level, or equivalent training and experience in the physical or biological sciences or in engineering;
- (B) Have 40 hours of formal instruction in:
 - (i) Radiation physics and instrumentation;
 - (ii) Radiation protection;
 - (iii) Mathematics pertaining to the use and measurement of radioactivity; and
 - (iv) Biological effects of radiation; and
- (C) Demonstrate an understanding of operating and emergency procedures and applicable parts of Title 180 or its equivalent.

007.02 MICROCURIE QUANTITIES. For use of microcurie quantities, the radiation safety officer, authorized user, or both must:

- (A) Have 40 hours of formal instruction in:
 - (i) Radiation physics and instrumentation;
 - (ii) Radiation protection;
 - (iii) Mathematics pertaining to the use and measurement of radioactivity; and
 - (iv) Biological effects of radiation; and
- (B) Demonstrate an understanding of operating and emergency procedures and applicable part of Title 180 or its equivalent.

008. PERSONNEL TRAINING AND EXPERIENCE REQUIREMENTS FOR LICENSES TO MANUFACTURE OR INTRODUCTION OF RADIOACTIVE MATERIAL INTO MANUFACTURED PRODUCTS AND DEVICES SPECIFIED IN 180 NAC 3-014.05, 3-014.06, 3-014.09, and 3-014.12 and 3-014.13. Licensees that manufacture or introduce radioactive material into products and devices must have personnel that meet the following education and training requirements.

008.01 RADIATION SAFETY OFFICER, AUTHORIZED USER, OR BOTH. The radiation safety officer, authorized user, or both must:

- (A) Have a college degree at the bachelor level, or equivalent training and experience in the physical or biological sciences or in engineering;
- (B) Have 40 hours of formal instruction in:
 - (i) Radiation physics and instrumentation;
 - (ii) Radiation protection;
 - (iii) Mathematics pertaining to the use and measurement of radioactivity; and
 - (iv) Biological effects of radiation; and
- (C) Demonstrate an understanding of operating and emergency procedures and these regulations or their equivalent.

009. PERSONNEL TRAINING AND EXPERIENCE REQUIREMENTS FOR LICENSES TO MANUFACTURE AND INTRODUCE RADIOACTIVE MATERIAL INTO RADIOPHARMACEUTICALS AS SPECIFIED IN 180 NAC 3-014.08. Licensees that manufacture and introduce radioactive materials into radiopharmaceuticals must have personnel that meet the following training and experience requirements.

009.01 RADIATION SAFETY OFFICER, AUTHORIZED USER, OR BOTH. The radiation safety officer, authorized user, or both must:

- (A) Be a registered pharmacist;
- (B) Have 200 hours of basic radioisotope handling techniques, including:
 - (i) Radiation physics and instrumentation;
 - (ii) Radiation protection;
 - (iii) Mathematics pertaining to the use and measurement of radioactivity;
 - (iv) Biological effects of radiation; and
 - (v) Radiopharmaceutical chemistry; and
- (C) Have three-hundred hours experience as a radiopharmaceutical chemist.

010. TRAINING AND EXPERIENCE REQUIREMENTS FOR PARTICLE ACCELERATORS PERSONNEL - NON HUMAN USE. Licensees that operate particle accelerators for non human use must have personnel that meet the following requirements.

010.01 RADIATION SAFETY OFFICER, SUPERVISOR, OR BOTH. The radiation safety officer, supervisor, or both must have a bachelor of science degree plus one year experience in the use and operation of particle accelerators that includes forty hours of instruction as specified for particle accelerator operators in 180 NAC 15-010.02.

010.02 PARTICLE ACCELERATOR OPERATORS. Particle accelerator operators must:

- (A) Have 40 hours of instruction in the fundamentals of radiation to include:
 - (i) Characteristics of radiation;
 - (ii) Units of radiation dose;
 - (iii) Biological effects of radiation; and
 - (iv) Levels of radiation from particle accelerators;
- (B) Be instructed in the methods used to prevent radiation exposure at the specific facility to be operated, including:
 - (i) Shielding;
 - (ii) Interlock system;

- (iii) Safety rules; and
- (iv) Radiation monitoring equipment;
- (C) Have one month of full time or equivalent on-the-job training under direct supervision. This training must be completed before assuming operational responsibility;
- (D) Have instruction on the use and care of personnel monitoring equipment employed at the facility;
- (E) Be familiar with the location and use of all operating controls;
- (F) Be familiar with the requirements of pertinent regulations in this title; and
- (G) Be familiar with the registrant's written operating and emergency procedures.

011. TRAINING AND EXPERIENCE FOR SELF-SHIELDED IRRADIATORS. Licensees that operate self-shielded irradiators must have authorized users that meet the following requirements.

011.01 AUTHORIZED USER. An authorized user must:

- (A) Have eight hours of formal instruction in:
 - (i) Radiation physics and instrumentation;
 - (ii) Radiation protection;
 - (iii) Mathematics pertaining to the use and measurement of radiation; and
 - (iv) Biological effects of radiation; and
- (B) Demonstrate an understanding of operating and emergency procedures and these regulations or their equivalent.

012. TRAINING AND EXPERIENCE REQUIREMENTS FOR INDUSTRIAL GAUGE PERSONNEL. Industrial gauge personnel must meet the following requirements.

012.01 RADIATION SAFETY OFFICER, AUTHORIZED USER, OR BOTH. The radiation safety officer or authorized user, or both must demonstrate competency in use, maintenance, and transfer of devices by satisfactorily completing an eight hour course provided by the manufacturer of the device or any Department accepted course.

013. TRAINING AND EXPERIENCE REQUIREMENTS FOR GAS CHROMATOGRAPH PERSONNEL. Gas chromatograph personnel must meet the following requirements.

013.01 RADIATION SAFETY OFFICER, AUTHORIZED USER, OR BOTH. The radiation safety officer or authorized user, or both, must receive and be competent in using operating procedures and manufacturer's instructions.

014. TRAINING AND EXPERIENCE REQUIREMENTS FOR INSTALLATION AND SERVICING OF RADIATION GENERATING EQUIPMENT AND ASSOCIATED RADIATION GENERATING EQUIPMENT AS SUPPLIED BY THE EMPLOYER. Personnel servicing radiation generating equipment must meet the following requirements.

014.01 INSTALLATION AND SERVICING PERSONNEL. A person performing installation or servicing of radiation generating equipment must have:

- (A) Formal training in radiation machine assembly, installation, or repair, or an associate's degree in biomedical equipment repair.
- (B) Six months of supervised on-the-job training on the assembly or repair, or both, of the types of equipment to be serviced.

TITLE 180 _____ CONTROL OF RADIATION

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TITLE 180 ~~CONTROL OF RADIATION~~

CHAPTER 15 ~~TRAINING AND EXPERIENCE REQUIREMENTS FOR USE OF
RADIATION SOURCES~~

15-001 SCOPE AND AUTHORITY

15-001.01 ~~180 NAC 15 establishes the training and experience requirements of personnel in 180 NAC 3, 5, 6, 8, 9, 12 and 20.~~

15-001.02 ~~It establishes the criteria which courses of instruction must possess prior to being approved by the Department for the certification training programs.~~

15-001.03 ~~The regulations are authorized by and implement the Nebraska Radiation Control Act, Neb. Stat. Rev. §§ 71-3501 to 71-3520.~~

15-002 DEFINITIONS: ~~As used in 180 NAC 15, the following definitions apply.~~

Experience ~~means active participation in events or activities, leading to accumulation of knowledge.~~

Formal Training ~~means training or education, including either didactic or clinical practicum or both, which has a specified objective, planned activities for students, and suitable methods for measuring student attainment, and which is offered, sponsored, or approved by an organization or institution which is able to meet or enforce these criteria.~~

15-003 RESERVED ~~Removed.~~

15-004 RESERVED ~~Removed.~~

15-005 RESERVED ~~Removed.~~

15-006 RESERVED ~~Removed.~~

15-007 RESERVED ~~Removed.~~

~~15-008 RESERVED~~ Removed.

~~15-009 RESERVED~~ Removed.

~~15-010 RESERVED~~ Removed.

~~15-011 RECENTNESS OF TRAINING:~~ The training and experience specified in 180 NAC 15 must have been obtained within the seven years preceding the date of application or the individual must have had related continuing education and experience since the required training and experience was completed.

~~15-012 RESERVED~~ Removed.

~~15-013 MINIMUM QUALIFICATIONS FOR RADIOLOGICAL MEDICAL PHYSICIST,
RADIOLOGICAL HEALTH PHYSICIST AND QUALIFIED EXPERT~~

~~15-013.01 Radiological Medical Physicist means a person having the knowledge and training to measure ionizing radiation, to evaluate safety techniques, and to advise regarding radiation protection needs. This person must have training and experience in the clinical applications of radiation physics. This person must have at least the following:~~

- ~~1. Is certified by the American Board of Radiology in Therapeutic Radiological Physics, Roentgen Ray and Gamma Ray Physics, X-Ray and Radium Physics; or Radiological Physics; or the American Board of Medical Physics in Radiation Oncology Physics or the Canadian College of Medical Physics. Certification must be in the specialty the individual will be clinically practicing, or~~
- ~~2. Holds a Master's or Doctor's Degree in physics, medical physics, other physical science, engineering, applied mathematics, nuclear physics, biophysics, radiological physics, or health physics and has completed one year of full time training in medical physics and an additional year of full time work experience under the supervision of a Radiological Medical Physicist that meets the requirements of 15-013.01, item 1 at a medical institution. Full time training and full time work experience must be in the specialty the individual will be clinically practicing.~~

~~15-013.02 Radiological Health Physicist with reference to radiation protection, means a person having the knowledge and training to measure ionizing radiation, to evaluate safety techniques, and to advise regarding radiation protection needs (for example, persons having relevant certification from the American Board of Radiology or American Board of Health Physics, or those having equivalent qualifications). With reference to shielding design, a person having particular knowledge and training in the field of radiation shielding. This person must have at least the following:~~

- ~~1. Is certified by the American Board of Health Physics or the American Board of Radiology in Therapeutic Radiological Physics, Roentgen Ray~~

~~and Gamma Ray Physics, X-Ray and Radium Physics, or Radiological Physics, Diagnostic Radiologic Physics; or the American Board of Medical Physics, or the Canadian College of Medical Physics; or~~

- ~~2. A Master's or a Doctor's degree in a physical or natural science or equivalent, biophysics, radiological physics or health physics, plus one year of full time experience in radiation protection and measurements, or~~
- ~~3. A Bachelor's Degree in a physical or natural science or equivalent, plus three years of full time training and experience in radiation protection and measurements and a written statement from a radiological health physicist as defined in 180 NAC 15-013.02, items 1 or 2 that two years of training and experience in radiation protection and measurements were obtained under his/her supervision.~~

~~15-013.03 Qualified Expert means an individual who has demonstrated to the satisfaction of the Department that s/he possesses the knowledge and training to measure ionizing radiation, to evaluate safety techniques, and to advise regarding radiation protection needs. This person must have at least the following:~~

- ~~1. A Bachelor's Degree in a physical or natural science, and one year of experience in radiation protection and measurements, or~~
- ~~2. A Certificate or an Associate Degree from an accredited radiological technology school and one year of experience in radiation protection and measurements.~~

15-014 RESERVED Removed.

15-015 TRAINING AND EXPERIENCE REQUIREMENTS FOR PERSONNEL FOR INSTITUTIONAL BROAD SCOPE TYPE LICENSE A, B, AND C LISTED IN 180 NAC 3-013

15-015.01 The minimum qualifications are:

1. Radiation Safety Officer
 - a. A college degree at the bachelor level, in physical or biological sciences or in engineering plus four years work experience in health physics, radiological health or another field equivalent to the above fields; or
 - b. A master's degree of graduate work in health physics or radiological health with two years of work experience in health physics or radiological health.
2. Authorized User

- a. ~~A college degree at the bachelor level, or equivalent training or experience, in the physical or biological sciences or in engineering; and~~
- b. ~~At least 40 hours of formal instruction in:~~
 - (1) ~~Radiation physics and instrumentation;~~
 - (2) ~~Radiation protection;~~
 - (3) ~~Mathematics pertaining to the use and measurement of radioactivity; and~~
 - (4) ~~Biological effects of radiation; and~~
- c. ~~One Hundred and Sixty hours experience in the safe handling of radioactive material.~~

~~15-016 PERSONNEL TRAINING AND EXPERIENCE REQUIREMENTS FOR LICENSEE'S IN AN EDUCATIONAL INSTITUTION OTHER THAN BROAD SCOPE LICENSES~~

~~15-016.01 Radiation Safety Officer and/or Authorized User:~~

- 1. ~~A college degree at the bachelor level, or equivalent training and experience in the physical or biological sciences or in engineering; and~~
- 2. ~~Forty hours of formal instruction in:~~
 - a. ~~Radiation physics and instrumentation;~~
 - b. ~~Radiation protection;~~
 - c. ~~Mathematics pertaining to the use and measurement of radioactivity, and~~
 - d. ~~Biological effects of radiation; and~~
- 3. ~~Demonstrate an understanding of institution radiation safety policy and procedures and Title 180 or their equivalent.~~

~~15-017 TRAINING AND EXPERIENCE REQUIREMENTS FOR LABORATORY AND INDUSTRIAL USE OF RADIOACTIVE MATERIAL PERSONNEL~~

~~15-017.01 For Millicurie Quantities:~~

- 1. ~~Radiation Safety Officer and/or Authorized User:~~
 - a. ~~A college degree at the bachelor level, or equivalent training and experience in the physical or biological sciences or in engineering; and~~
 - (1) ~~Forty hours of formal instruction in:~~
 - (a) ~~Radiation physics and instrumentation;~~
 - (b) ~~Radiation protection;~~

- ~~(c) Mathematics pertaining to the use and measurement of radioactivity; and~~
- ~~(d) Biological effects of radiation; and~~
- ~~(2) Demonstrate an understanding of operating and emergency procedures and Title 180 or their equivalent.~~

~~15-017.02 For Microcurie Quantities:~~

- ~~1. Radiation Safety Officer and/or Authorized User:
 - ~~a. Forty hours of formal instruction in:
 - ~~(1) Radiation physics and instrumentation;~~
 - ~~(2) Radiation protection;~~
 - ~~(3) Mathematics pertaining to the use and measurement of radioactivity; and~~
 - ~~(4) Biological effects of radiation; and~~~~
 - ~~b. Demonstrate an understanding of operating and emergency procedures and Title 180 or their equivalent.~~~~

~~15-018 PERSONNEL TRAINING AND EXPERIENCE REQUIREMENTS FOR LICENSES TO MANUFACTURE OR INTRODUCTION OF RADIOACTIVE MATERIAL INTO MANUFACTURED PRODUCTS AND DEVICES SPECIFIED IN 180 NAC 3-014.05, 3-014.06, 3-014.09, and 3-014.12 and 3-014.13~~

~~15-018.01 Radiation Safety Officer and/or Authorized User:~~

- ~~1. A college degree at the bachelor level, or equivalent training and experience in the physical or biological sciences or in engineering; and~~
- ~~2. Forty hours of formal instruction in:
 - ~~a. Radiation physics and instrumentation;~~
 - ~~b. Radiation protection;~~
 - ~~c. Mathematics pertaining to the use and measurement of radioactivity;~~
 - ~~d. Biological effects of radiation; and~~~~
- ~~3. Demonstrate an understanding of company radiation safety policy and procedures and Title 180 or their equivalent.~~

~~15-019 PERSONNEL TRAINING AND EXPERIENCE REQUIREMENTS FOR LICENSES TO MANUFACTURE AND INTRODUCE RADIOACTIVE MATERIAL INTO RADIOPHARMACEUTICALS AS SPECIFIED IN 180 NAC 3-014.08~~

~~15-019.01 Radiation Safety Officer and/or Authorized User:~~

1. A registered pharmacist;
2. Basic radioisotope handling techniques of 200 hours, including:
 - a. Radiation physics and instrumentation;
 - b. Radiation protection;
 - c. Mathematics pertaining to the use and measurement of radioactivity;
 - d. Biological effects of radiation; and
 - e. Radiopharmaceutical chemistry.
3. Three hundred hours experience as a radiopharmaceutical chemist.

~~15-020 RESERVED~~ Removed.

~~15-021 RESERVED~~ Removed.

~~15-022 RESERVED~~ Removed.

~~15-023 RESERVED~~ Removed.

~~15-024 RESERVED~~ Removed.

~~15-025 TRAINING AND EXPERIENCE REQUIREMENTS FOR PARTICLE ACCELERATORS
PERSONNEL NON HUMAN USE~~

~~15-025.01 Radiation Safety Officer or Supervisor must have a Bachelor of Science Degree plus one year experience in the use and operation of particle accelerators which includes forty hours instruction as specified for particle accelerator operators.~~

~~15-025.02 Operators must have 40 hours instruction in subject matter listed below and three months experience, the first one month on-the-job training must be under direct supervision:~~

1. Forty Hours instruction of Particle Accelerator Operators
 - a. All operators must be instructed in the fundamentals of radiation.
 - (1) Characteristics of radiation.
 - (2) Units of radiation dose (sievert/rem).
 - (3) Biological effects of radiation.
 - (4) Levels of radiation from particle accelerators.
 - (5) Methods used to prevent radiation exposure at the specific facility to be operated:
 - (a) Shielding
 - (b) Interlock system
 - (c) Safety rules
 - (d) Radiation monitoring equipment

2. ~~_____~~ All operators must:

- a. ~~_____~~ Be instructed on the use and care of personnel monitoring equipment employed at the facility.
- b. ~~_____~~ Be familiar with the location and use of all operating controls.
- c. ~~_____~~ Be familiar with the requirements of pertinent State regulations.
- d. ~~_____~~ Be familiar with the registrant's written operating and emergency procedures.
- e. ~~_____~~ Receive at least one month of full time or equivalent on-the-job training before assuming operational responsibility.

15-026 TRAINING AND EXPERIENCE FOR SELF-SHIELDED IRRADIATORS

1. ~~_____~~ Authorized User:

- a. ~~_____~~ Eight hours of formal instruction in:
 - (1) ~~_____~~ Radiation physics and instrumentation;
 - (2) ~~_____~~ Radiation protection;
 - (3) ~~_____~~ Mathematics pertaining to the use and measurement of radiation; and
 - (4) ~~_____~~ Biological effects of radiation; and
- b. ~~_____~~ Demonstrate an understanding of operating and emergency procedures and Title 180 or their equivalent.

15-027 TRAINING AND EXPERIENCE REQUIREMENTS FOR INDUSTRIAL GAUGE PERSONNEL

15-027.01 Radiation Safety Officer and/or Authorized User: Demonstrate competency in use, maintenance and transfer of device by satisfactory completion of eight hour course provided by the manufacturer of the device or any Department accepted course.

15-028 RESERVED Removed.

15-029 TRAINING AND EXPERIENCE REQUIREMENTS FOR GAS CHROMATOGRAPH PERSONNEL

15-029.01 Radiation Safety Officer and/or Authorized User: Has received and is competent in operating procedures and manufacturer's instructions.

15-030 RESERVED Removed.

15-031 RESERVED Removed.

15-032 TRAINING AND EXPERIENCE REQUIREMENTS FOR MANAGEMENT OF RADIOACTIVE WASTE PERSONNEL

15-032.01 Radiation Safety Officer (RSO)

1. The RSO must have experience in applied radiation protection at nuclear facilities or waste disposal sites dealing with radiation protection problems. The individual should be familiar with the design features and operations of LLW sites that affect the potential for exposures of site personnel to radiation. In addition, the RSO should have the technical competence to establish radiation protection programs and the supervisory capability to direct the work of radiation protection technicians.
2. The RSO should have a bachelor's degree in science or engineering (or equivalent), including formal training in radiation protection. Minimum acceptable substitutes for a bachelor's degree are a high school diploma or its equivalent and one of the following: (1) four years of formal schooling in science or engineering, (2) four years of applied experience at a nuclear facility in the area of radiation protection, or (3) any combination of the above totaling four years, and
3. The RSO should have at least three years of experience in radiation protection, one year of which should be at a LLW disposal site. If the RSO does not have a bachelor's degree, then a total of seven years experience is recommended. A master's degree and doctor's degree may be considered equivalent to one and two years experience, respectively, if the course work is related to radiation protection.

15-032.02 Radiation Protection Technician

1. The senior radiation protection technician should have three years of working experience in radiation protection of which one year should be from an LLW disposal site. The technician should possess a high degree of manual dexterity and ability, and should be capable of learning and applying basic skills.
2. Individuals in training or apprentice positions should not be considered technicians, but should be permitted to perform work for which qualification has been demonstrated. The classification of radiation protection technicians should be as follows:
 - a. In training (minimal experience) - apprentice technician.
 - b. 0-3 years experience - technician.
 - c. Greater than three years experience - senior technician.

However, time alone is not enough. Any training and advancement program should also require technicians to pass written and oral examinations before advancing to different technician levels.

15-032.03 Radiation Protection Training Instructor

- ~~1. At the time of appointment to the instructor position, the responsible individual must have experience in applied radiation at nuclear facilities dealing with the radiation protection problems and programs similar to those at LLW disposal sites. The individual should be familiar with the design features and operations of LLW sites that affect the potential for exposure of site personnel to radiation.~~
- ~~2. The instructor should have an associate's degree in science or engineering (or equivalent), including formal training in radiation protection. Minimum acceptable substitutes for an associate degree are a high school diploma or its equivalent and one of the following: (1) two years of formal schooling in science or engineering, (2) two years of applied experience at a nuclear facility in the area of radiation protection, or (3) any combination of the above totaling two years. The instructor should have one year of experience in radiation protection at an LLW disposal site. If the instructor does not have an associate's degree, then a total of three years experience is recommended.~~

~~15-032.04 General Employee: Information on the LLW site's radiation protection policy and program should be presented to all new employees during the general employee orientation training. The orientation training should consist of classroom instruction and may be supplemented by other training methods. Written material covering the basic topics of the training should be distributed to the new employees for future reference. Visitor and contractor personnel should be given the same training, if it is expected that they may encounter radioactive material or radiation levels above background. It is recommended that the classroom instruction phase of this training be at least eight hours in length.~~

~~15-032.05 Radiation Worker: Personnel who work in a radiation area are termed radiation workers and their radiation worker training must be received prior to entering or beginning work in a radiation area. The classroom instruction phase of this training must be at least twenty hours in length.~~

Removed.

~~15-033 TRAINING AND EXPERIENCE REQUIREMENTS FOR INSTALLATION AND/OR SERVICING OF RADIATION GENERATING EQUIPMENT AND ASSOCIATED RADIATION GENERATING EQUIPMENT AS SUPPLIED BY THE EMPLOYER~~

~~15-033.01 A minimum of eight hours of formal course work or as approved by the Department should be completed and include the following:~~

- ~~1. Radiation physics and instrumentation~~
- ~~2. Radiation protection~~
- ~~3. Mathematics pertaining to the use and measurement of radiation~~
- ~~4. Biological effects of radiation~~

~~15-033.02 On-the-job training should include hands-on experience installing and/or servicing radiation generating equipment and associated radiation generating equipment~~

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~~components. On-the-job training must be for six months under the supervision of an individual who has completed the training in 180 NAC 15-033.01.~~