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

15-004 RESERVED

15-005 RESERVED

15-006 RESERVED

15-007 RESERVED

15-008 RESERVED

15-009 RESERVED

15-010 RESERVED

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

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

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 3-014.01 through 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

15-021 RESERVED

15-022 RESERVED

15-023 RESERVED

15-024 RESERVED

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 ~~RESERVED~~

1. 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.

15-027 TRAINING AND EXPERIENCE REQUIREMENTS FOR INDUSTRIAL GAUGE PERSONNEL

15-027.01 Licensed 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~~approved~~ course.

15-028 TRAINING AND EXPERIENCE REQUIREMENTS FOR ANALYTICAL X-RAY EQUIPMENT PERSONNEL

15-028.01 At least 20 hours of instruction in the fundamentals of:

1. Radiation physics and instrumentation;
2. Radiation protection;
3. Radiation units of measurement;
4. Biological effects of radiation; and
5. Equipment operation

   a. Operation of analytical x-ray equipment;
   b. Safety devices;

c. Labeling;
d. Registrant's operations and emergency procedures; and
e. Case histories of analytical x-ray accidents.

15-029 TRAINING AND EXPERIENCE REQUIREMENTS FOR GAS CHROMATOGRAPH PERSONNEL

15-029.01 Licensed User: Has received and is competent in operating procedures and manufacturer's instructions.

15-030 RESERVED

15-031 RESERVED

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.

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 radioactivity
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 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.

15-034 RESERVED