

TITLE 180 CONTROL OF RADIATION

CHAPTER 15 TRAINING AND EXPERIENCE REQUIREMENTS FOR USE OF RADIATION SOURCES

Effective Date: 11/25/2020

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.EFFECTIVE

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.

