

Radiation Safety Officer Training (5-day) and Radiation Safety Officer Refresher (2-day)

Radiation and radioactivity are used in an incredible variety of locations, including hospitals, industry, academia, and field locations. Any organization that uses radiation or radioactivity must designate someone as a Radiation Safety Officer, and regulations require that all RSOs receive training before they can assume this responsibility, and refresher training every two years thereafter. This course meets all regulatory requirements for radiation safety officer training and, upon completion, students will have a solid understanding of radiation safety science, practice, and regulations.

Past students of this class have worked for a number of types of organizations, including:

- Medical facilities with x-ray device registration or a radioactive materials license
- Factories and other plants with radioactive process control, or tank level gauges
- Environmental and geotechnical firms with soil moisture/density “nuclear” gauges
- Law enforcement or emergency response organizations who might have to respond to radiological accidents or emergencies
- Regulatory agencies
- Biotechnical and other research firms

Radiation Safety Officer Short Course (40 hours)

1. Review of basic physical concepts
 - a. Properties of atoms, elements, isotopes
 - b. Types and properties of alpha, beta, gamma, and neutron radiation
 - c. Chart of nuclides
 - d. How radiation interacts with matter
2. Radiation dose and dose reduction
 - a. Determining dose from gamma-emitting isotopes
 - b. Effects of time, distance, and shielding on radiation dose
 - c. Shielding calculations
3. Radiation effects on health
 - a. Radiation interactions in cells
 - b. Cellular response
 - c. Effects of acute radiation exposure
 - d. Effects of chronic radiation exposure
 - e. Reproductive effects of radiation exposure
4. Introduction to radiation detection instruments
 - a. Gas-filled detectors
 - b. Scintillation-type detectors
 - c. Laboratory equipment
 - d. Radiation dosimeters
5. Using radiation detection instruments (e.g. how to conduct a survey)
 - a. Interpreting the results of radiation instruments
 - b. Performing radiation surveys
 - c. Performing contamination surveys
 - d. Common problems and their resolution
6. Radiation safety practices
 - a. Opening radiological packages
 - b. Transportation of radioactive materials
 - c. Performing sealed source leak test surveys
 - d. Performing sealed source inventory checks
 - e. Performing smear wipe surveys
 - f. Surveying people
7. Responding to radiological accidents, incidents, and emergencies
 - a. Radiological spills
 - b. High radiation dose rate
 - c. Contaminated personnel
 - d. Contamination control
 - e. Responding to radiological terrorism

8. Radiological regulations
 - a. Overview of basic regulatory requirements
 - b. Regulatory inspections and their conduct
 - c. An RSO's responsibilities

9. The art of being an RSO
 - a. Establishing policies and procedures
 - b. Conducting inspections and enforcing policy requirements
 - c. Dealing with policy violations
 - d. Working with management and regulators

Additional materials for Medical RSOs (as applicable)

1. Fetal radiation exposure
 - a. Effects of radiation exposure to the fetus
 - b. Calculating fetal dose
 - c. Reporting dose to patient and her OB/GYN
 - d. Legal considerations
2. Quality Assurance
 - a. QA Committee
 - b. Tracking QA parameters
 - c. Required checks (Radiation Oncology, Nuclear Medicine, Radiology)
3. Nuclear Medicine
 - a. Coverage for I-131 patients (room preparation, stay time calculations, etc.)
 - b. Surveys in nuclear pharmacy, patient rooms, etc.
 - c. Release of I-131 patients
 - d. Bioassay for Nuclear Medicine staff
 - e. Special requirements for PET facilities
4. Radiation Oncology
 - a. Radiation safety around linear accelerators
 - b. Radiation safety around therapy sources
 - c. Stay time determinations for patients' families
 - d. Dose reduction (time, distance, shielding) for staff
5. Radiology
 - a. High-dose procedures (cardiac catheterization, angiography, orthopedics)
 - b. Special precautions during fluoroscopy
 - c. X-ray suite shielding
6. Other sources of radiation and radioactivity
 - a. Blood bank irradiators
 - b. RIA (radio-immuno assay) kits
 - c. Diagnostic laboratories
 - d. Research laboratories