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<b>4.</b>	<b>Document Changes</b> Complete revision to reflect compliance with the 06/08/07 Amendment to 10CFR835 and consistency with the subsequent revision of the DOE Radiological control Standard (Change Notice, May 2009)
<b>5.</b>	<b>Training Requirements:</b> As with any procedure revision, those employees affected by the procedure need to familiarize themselves with the changes. No additional training is required.

## Training and Qualification

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### Chapter 6 Training and Qualification

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## **Part 1 Radiological Control Training and Qualification**

### **611 Purpose**

The provisions of this chapter ensure that individuals are trained to work safely in and around radiological hazards and to maintain radiation exposures ALARA. Training provisions in this chapter apply to individuals entering SRS controlled areas and other individuals who are responsible for developing and implementing radiological control measures.

### **612 Regulatory Basis**

1. 10 CFR 835.901 establishes requirements for radiation safety training programs for two classes of individuals: 1) individuals who are permitted unescorted access to controlled areas or occupationally exposed to radiation; and 2) individuals who are permitted unescorted access to radiological areas or perform unescorted assignments as a radiological worker. Within this Manual, these training programs are referred to as General Employee Radiological Training and Radiological Worker Training (I and II), respectively. In addition, 10 CFR 835.103 establishes requirements for the education, training, and skills of individuals who are responsible for developing and implementing measures necessary for ensuring compliance with 10 CFR 835.
2. Successful completion of a core radiological training course (i.e., Radiological Worker Training) at one DOE site within the past two years should be recognized by SRS Contractors with concurrence from the M&O Radiological Training Manager. However, any additional radiological control training necessary for the individuals to perform radiological work or to enter specific areas, including site-specific aspects of the radiological safety training, shall be completed.

### **613 General Provisions**

1. Radiological safety training shall include the following topics, to the extent appropriate to each individual's prior training, work assignments, and degree of exposure to potential radiological hazards:
  - a. Risks of exposure to radiation and radioactive materials, including prenatal radiation exposure [835.901(c)(1)]
  - b. Basic radiological fundamentals and radiation protection concepts [835.901(c)(2)]
  - c. Controls, limits, policies, procedures, alarms, and other measures implemented at SRS to control doses, including both routine and emergency actions [835.901(c)(3)]
  - d. Individual rights and responsibilities as related to implementation of SRS radiological protection program [835.901(c)(4)]

- e. Individual responsibilities for implementing ALARA measures [835.901(c)(5)]
  - f. Individual exposure reports that may be requested [835.901(c)(6)].
2. Prior to permitting an individual to enter a radiological area unescorted or perform unescorted radiological work, training commensurate with the hazard in the area and required controls shall be completed [835.901(b)]. Examinations and performance demonstrations shall be used to demonstrate satisfactory completion of initial Radiological Worker Training [835.901(b)]. Examinations shall be used to demonstrate satisfactory completion of biennial Radiological Worker Training [835.901(e)]. Examinations should be written; however, the Contractor radiological control manager may approve alternatives to accommodate special needs.
  3. Training should address both normal and abnormal situations in radiological control.
  4. General Employee Radiological Training and Radiological Worker Training shall be completed at intervals not to exceed 24 months, on the last day of the month. This biennial training should not be limited subjects with which the students are already familiar, but should focus on applicable lessons learned and topics that will increase the students' knowledge of radiological hazards and controls. Training shall also be provided to effected individuals when there is a significant change to the radiological control program. Changes to the radiological control program should be incorporated into the training program on a periodic basis. [835.901(e)]
  5. Measures should be implemented to ensure that each individual's current training status can be assessed as necessary to ensure appropriate job assignments and to permit effective entry control.
  6. Site-specific training should include changes in requirements and applicable updates of lessons learned from operations and maintenance experience and occurrence reporting, for the site and across the DOE complex.
  7. Reading and comprehension skills in the English language are generally necessary for radiation safety training. The Contractor radiological control manager is authorized to approve alternative measures for those lacking reading and comprehension skills in the English language until adequate English language skills can be achieved. The alternative measures should be sufficient to ensure that the affected individuals can respond appropriately to any audible or visual warnings that they may encounter in the facility. Orientation and the use of trained escorts provide an alternate to training with the concurrence of the Contractor radiological control manager.

8. Verification of the effectiveness of radiation safety training should be accomplished by surveying a limited subset of former students in the workplace. This verification is in addition to performance evaluations routinely performed by training departments. This evaluation should include observation of practical applications and discussions of the course material and may include written examinations. The survey should be performed by radiological control managers, quality assurance personnel, or senior instructors after the former student has had the opportunity to perform work for several months. The results should be documented and may be used to identify the need for remedial training.
9. The Contractor radiological control manager or designee should concur in radiological safety training material. The M&O Radiological Protection Department Director or designee approves changes in radiological safety training material.
10. Requirements and guidance for training records and course documentation are provided in Article 725.

#### **614 Instructor Training and Qualifications**

1. All instructors should be qualified in accordance with the site's instructor qualification program or possess equivalent qualifications (see Manual 4B, Procedure 2.5).
2. Subject matter experts without instructor qualification may provide training in their areas of expertise. However, these subject matter experts should be trained as instructors when this occurs routinely.

### **Part 2 General Employee Radiological Training**

Table 3-1 summarizes the requirements for those individuals who should receive General Employee Radiological Training.

#### **621 General Employees**

1. General employees shall complete radiological safety training prior to unescorted access to controlled areas and prior to receiving occupational radiation exposure during access to controlled areas. This training shall address the radiological safety training topics in Article 613.1 to the extent appropriate for the degree of exposure to radiological hazards that may be encountered and the required controls <sup>[835.901(a)]</sup>.
2. Additional training beyond General Employee Radiological Training should be required for unescorted entry into radiological buffer areas or areas posted for radiological control other than controlled areas.

3. If an escort is used in lieu of training, then the escort shall have completed the level of training required for the areas to be entered and the work to be performed and shall ensure that the escorted individual complies with the radiological protection program [835.901(d)].

## **622 Radiological Safety Training and Orientation for Members of the Public**

1. Members of the public shall receive radiological safety training prior to being permitted unescorted access to controlled areas. This training shall address the radiological safety training topics in Article 613.1 to the extent appropriate for the degree of exposure to radiological hazards that may be encountered and the required controls [835.901(a)].
2. DOE encourages its operating entities to continuously escort members of the public in the controlled area. However, when members of the public are trained in accordance with Article 622.1, the following additional criteria should be met prior to permitting unescorted access to controlled areas:
  - a. Prior approval by the area radiological control manager
  - b. Appropriate limitations are established on the areas to be entered and the activities to be undertaken to prevent occupational exposure
  - c. The individual receives enhanced training providing information commensurate with the areas to be entered and activities to be undertaken while unescorted.
3. Members of the public, including tour groups and visiting dignitaries, who enter the controlled area and are continuously escorted, should receive a radiological safety orientation. This orientation should include the following topics and be commensurate with the hazards present in the areas to be entered and the required controls:
  - a. Risk of low-level occupational radiation exposure, including cancer and genetic effects
  - b. Risk of prenatal radiation exposure
  - c. Member of the public and management responsibilities for radiological safety
  - d. Adherence to radiological posting and labeling
  - e. Applicable emergency procedures
  - f. Training for issuance of dosimeters, where applicable.
4. Information may be communicated by classroom lecture, videotape, or other appropriate methods.
5. Sign-in logs may be used as radiological safety training and orientation records as required by Article 725.

### **Part 3 Radiological Worker Training**

Table 3-1 summarizes the requirements for those individuals who should receive Radiological Worker Training.

#### **631 General Provisions**

1. Each individual shall demonstrate knowledge of the radiological safety training topics established in Article 613.1, commensurate with the hazards in the area and required controls, by successful completion of an examination and appropriate performance demonstrations prior to being permitted unescorted access to radiological areas and prior to performing unescorted assignments as a radiological worker [835.901(b)].
2. Workers may challenge Radiological Worker I or II core knowledge requirements by passing a comprehensive examination. If unsuccessful in one attempt, the entire standardized core Radiological Worker I or II Training should be completed. Challenges should not apply to the site-specific portions.
3. Radiological Worker I Training is not a prerequisite for Radiological Worker II training.
4. Radiological Worker II Training includes all of the requirements of Radiological Worker I Training and expands on the topic of hands-on work with radioactive materials. Radiological Worker II Training prepares the worker to deal with higher levels of radiation and radioactive contamination.
5. If an escort is used in lieu of training, then the escort shall have completed the level of training required for the areas to be entered and the work to be performed and shall ensure that the escorted individual complies with the radiological protection program [835.901(d)].

#### **632 Radiological Worker I**

1. Radiological Worker I Training, including High/Very High Radiation Area Training (Article 632.2), should encompass at a minimum the following practical factors:
  - a. Entering and exiting simulated radiological buffer areas and radiation areas (and high radiation areas when such training is included)
  - b. Performance of frisking for personnel contamination, as applicable
  - c. Verification of instrument response and source check
  - d. Proper response to alarm situations.

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2. Unescorted worker access to high and very high radiation areas may be permitted upon successful completion of Radiological Worker I Training and High/Very High Radiation Area Training. Individuals who complete this training should not be allowed to enter contamination, high contamination, or airborne radioactivity areas unescorted, nor should they be allowed to enter soil contamination areas during activities that will disturb the soil.

### **633 Radiological Worker II**

Radiological Worker II Training should encompass at a minimum the following practical factors:

- a. Donning of protective clothing, if applicable
- b. Entering a simulated radiological buffer area, contamination area, and radiation area to perform a task, if applicable
- c. Proper response to simulated abnormal situations
- d. Proper response to simulated alarms or faulty radiological control equipment
- e. Removing protective clothing and equipment and subsequently exiting the simulated area, if applicable
- f. Performance of frisking for personnel contamination, if applicable
- g. Verification of instrument response and source check.

### **634 Specialized Radiological Worker Training**

Specialized Radiological Worker Training should be completed for non-routine operations or work in areas with changing radiological conditions. This training is in addition to Radiological Worker II Training and should be provided to personnel planning, preparing, and performing jobs that have the potential for significant radiological consequences. Such jobs may involve special containment devices, the use of mockups, and ALARA considerations. In some cases, pre-job briefings provide an acceptable alternative to Specialized Radiological Worker Training.

## **Part 4 Radiological Control Inspector and Radiological Control Manager Qualification**

### **641 General Provisions**

Training and qualification of Radiological Control Inspectors (RCIs) and their immediate managers should address routine operations and also focus on recognizing and handling situations in both normal and changing radiological conditions.

## **642 Radiological Control Inspector**

1. Because of the nature of their duties (e.g., monitoring the workplace, implementing administrative controls and entry controls), RCIs would generally be expected to have responsibility for implementing measures necessary for ensuring compliance with 10 CFR 835. Therefore, RCIs will generally be subject to the education, training, and skills requirements of 10 CFR 835.103. RCI training should include the standardized core course training materials, as applicable, which should be expanded to include site-specific information.
2. RCI candidates who have prerequisite knowledge, such as college credit, operational experience, or related qualifications, may satisfy individual sections of the RCI core course training requirements by passing comprehensive challenge examinations.
3. Entry-level prerequisites should be established to ensure that RCIs meet the standards for physical condition and education. At a minimum, these standards should include the following: (SRS-ESH&QA-1994-03)
  - a. High school education or equivalency
  - b. Fundamentals of mathematics, physics, chemistry, and science
  - c. Systems and fundamentals of process, operations, and maintenance (presented as part of the qualification curriculum).
  - d. Reading and comprehension level sufficient to follow procedures, write permits, prepare survey maps, write reports, and prepare shipping and transfer permits
  - e. Ability to work in a support role, including communicating verbal instructions to others
  - f. Physical requirements to handle personal protective equipment and other equipment and assist others in work locations, commensurate with assignment.
4. RCIs are encouraged to pursue registration by the National Registry of Radiation Protection Technologists (NRRPT). RCIs achieving NRRPT registration are exempted from their next comprehensive written exam.

## **643 Qualification Standards for Radiological Control Inspectors**

Qualification Standards define the requirements for demonstrating completion of training. Signatures on the forms in Qualification Standards provide documentation of satisfactory proficiency.

1. The Qualification Standards from the RCI core course should be supplemented to include site-specific elements.
2. Qualification Standards for the radiological control inspector position should include on-the-job training to provide hands-on experience directly applicable to the job.

#### **644 Oral Examination Boards**

The oral examination board provides an opportunity to identify areas of strength and weakness related to performance of radiological control inspector duties and manager functions. The oral examination board also provides the opportunity to identify additional training needs to enhance radiological control inspector and first line manager training programs.

1. An oral examination board should determine the initial qualification and requalification of candidates for RCI and first line manager positions.
2. The Contractor radiological control manager should designate the board members and appoint a chairperson.
3. The board constituted to evaluate RCI qualification should be composed of at least three persons to include an RCI first line manager, radiological control staff, and line management operations department managers and staff personnel, as applicable. RCI instructors may participate as non-voting members.
4. The board should assess the candidate's response to normal and emergency situations. Questions should be of the types that are not normally covered in a written examination.
5. The board constituted to evaluate RCI first line manager qualification should not include peers or subordinates as voting members.

#### **645 Continuing Training**

1. Following initial qualification, the RCI should begin a 2-year cycle of continuing training required for requalification.
2. Every requalification should include completion of practical training and a comprehensive written examination. A final oral examination board is encouraged.
3. Continuing training should include site-specific and DOE-wide changes in requirements and updates of lessons learned from operating experience and industry events.
4. Continuing training should include written examinations as applicable, demonstrations of proficiency controlled by qualification standards, and oral examinations as needed to prepare for the comprehensive biennial requalification.
5. Infrequently performed tasks, such as those for emergency response, may require annual training. Other tasks may require training prior to initiation.

### **646 Radiological Control First Line Managers**

1. Because of the nature of their duties, First Line Managers (FLM) would generally be considered to be subject to the education, training, and skill requirements of 10 CFR 835.103. Training and education standards for FLMs should be consistent with DOE-STD-1107-97, Knowledge, Skills, and Abilities for Key Radiation Protection Positions at DOE Facilities.
2. FLMs should have supervisory and leadership capabilities to direct the work of technicians; effectively interact with crafts, line managers, professional staff, and other managers; and be able to respond and direct others in emergency and abnormal situations.
3. FLMs knowledge of facility radiological control hazards, programs, and procedures should be reassessed every 2 years. The use of comprehensive oral examination boards in accordance with Article 644 is encouraged.
4. Oral examination boards should focus on the ability to analyze situations and supervise subordinates. The FLMs depth of knowledge should exceed that expected of an RCI.

### **647 Subcontracted Radiological Control Inspectors**

1. Because their responsibilities closely parallel those of in-house RCIs, subcontracted RCIs would generally be considered to be subject to the education, training, and skill requirements of 10 CFR 835.103 and should have the same knowledge and qualifications required of facility technicians performing the same duties. To obviate the need for full training as an RCI, the training and qualification program should include the following:
  - a. Review of resumes to identify technicians with experience in jobs similar to those for which they will be employed
  - b. Written examination and oral evaluation to verify appropriate knowledge level
  - c. Identification of the duties technicians will be authorized to perform
  - d. Training in facility procedures and equipment associated with the authorized duties
  - e. Training on recent operating experience
  - f. Observation of on-the-job performances by the RCO first line manager.
2. Subcontracted RCIs who work at the facility for extended time periods (more than 6 months) should receive continuing training commensurate with their assigned duties. Completion of a limited oral examination by the radiological control Facility Manager is encouraged after two years onsite.

## **Part 5 Other Radiological Training**

### **651 Management Training**

1. Training and education standards for line managers of radiological control programs (or elements of those programs) should be consistent with DOE-STD-1107-97, Knowledge, Skills, and Abilities for Key Radiation Protection Positions at DOE Facilities.
2. Line managers who manage, supervise, or provide oversight of radiological control programs would generally be considered to be subject to the education, training, and skill requirements of [835.103] and should be trained accordingly.
3. Such training should be based on DOE's core course training materials supplemented by site-specific procedures and be completed by new personnel prior to formally assuming line supervision and management responsibilities. This training should include the following:
  - a. Guidance on handling such personnel interactions
  - b. Emphasis on being factual
  - c. Fundamentals of communicating risk
  - d. Importance of keeping management informed.
4. Incumbents should participate in continuing training. The continuing training should emphasize self-assessment and external evaluations including performance indicators, root causes, and lessons learned based on operational experience.

### **652 Technical Support Personnel**

Appropriate technical support personnel (engineers, schedulers, procedure writers) may be considered to be subject to the education, training, and skill requirements of 10 CFR 835.103 [835.103] and should be trained in the ALARA fundamentals and dose reduction techniques. Technical support personnel should receive training consistent with DOE-HDBK-1110-97, ALARA Training for Technical Support Personnel.

### **653 Planners**

Planners who develop detailed work plans involving or associated with radioactivity or radioactive materials should have Radiological Worker Training to the level required by the workers using the work plans. Planners would generally be considered to be subject to the education, training, and skill requirements of 10 CFR 835.103 [835.103]. Planners should receive training consistent with DOE-HDBK-1110-97, ALARA Training for Technical Support Personnel (see SRS training course QHRG0900). This training should be completed within six months of assignment to a radiological work planner position. Pending course completion, the planner can plan radiological work under the direction of a qualified planner. [MTS 2]

## **654 Radiological Control Personnel**

1. Radiological control senior staff (see Article 143) and management would generally be considered to be subject to the education, training, and skill requirements of 10 CFR 835.103 [835.103] and should have:
  - a. A combination of education and experience commensurate with their job responsibilities
  - b. Continuing training based on an assessment of job responsibilities to maintain and enhance proficiency
  - c. Continuing training to remain cognizant of changes to the facility, operating experience, procedures, regulations, and quality assurance requirements.
2. Radiological support personnel may include but are not limited to: dosimetry technicians; instrument technicians; medical personnel, whole body counter technicians; and laboratory personnel.
3. Radiological support personnel would generally be considered to be subject to the education, training, and skill requirements of 10 CFR 835.103 [835.103] and should have:
  - a. Training appropriate to the tasks to be performed
  - b. Continuing training to provide continued improvement in knowledge and skills.
4. Training and education standards for radiological control senior staff and support personnel should be consistent with DOE-STD-1107-97, Knowledge, Skills, and Abilities for Key Radiation Protection Positions at DOE Facilities.
5. Certification and involvement with professional industry organizations should be encouraged.

## **655 Radiographers and Radiation Generating Device Operators**

1. Industrial radiographers would generally be considered to be subject to the education, training, and skill requirements of 10 CFR 835.103 [835.103] and should have training in accordance with 10 CFR 34.31.
2. Radiation generating device operators would generally be considered to be subject to the education, training, and skill requirements of 10 CFR 835.103 [835.103] and should have training appropriate for the radiation source involved.

## **656 Emergency Response Personnel**

Provisions should be in place to accommodate rapid site and radiological area access by on-site and off-site emergency workers such as firefighters, medical personnel, and security personnel.

1. Emergency response personnel should receive special radiological worker training commensurate with the situations they are likely to encounter. Any individual assigned to perform emergency actions that may result in a dose exceeding the occupational dose limits shall receive Radiological Worker or equivalent training [835.1302(d)]. They shall be briefed beforehand on the known or anticipated hazards to which they will be subjected [835.1302(d)].
2. Such training should be based on DOE's Radiological Worker core course and site-specific training materials.
3. If such workers are not trained, trained escorts should be assigned.
4. Training should make it clear that lifesaving has priority over radiological controls.
5. Records of this training should be maintained.

### **Part 6 Reserved**