

RADIOLOGICAL CONTROL MANUAL

Identifier: PRD-183
Revision: 7
Page: 6-1 of 6-15

CHAPTER 6 CONTENTS

| | |
|--|------|
| CHAPTER 6, TRAINING AND QUALIFICATION | 6-2 |
| Part 1, Radiological Control Training and Qualification..... | 6-2 |
| Article 611, Purpose..... | 6-2 |
| Article 612, Standardization | 6-2 |
| Article 613, General Provisions..... | 6-3 |
| Article 614, Instructor Training and Qualifications..... | 6-5 |
| Part 2, General Employee Radiological Training | 6-5 |
| Article 621, Site Personnel | 6-6 |
| Article 622, Radiological Safety Training and Orientation for Members of the Public | 6-6 |
| Part 3, Radiological Worker Training..... | 6-7 |
| Article 631, General Provisions..... | 6-7 |
| Article 632, Radiological Worker I | 6-8 |
| Article 633, Radiological Worker II | 6-9 |
| Article 634, Specialized Radiological Worker Training..... | 6-9 |
| Part 4, Radiological Control Technician and Radiological Control Technician Foreman Qualification | 6-9 |
| Article 641, General Provisions..... | 6-9 |
| Article 642, Radiological Control Technician..... | 6-9 |
| Article 643, Qualification Standards for Radiological Control Technicians..... | 6-10 |
| Article 644, Oral Examination Boards..... | 6-10 |
| Article 645, Continuing Training..... | 6-11 |
| Article 646, Radiological Control Technician Foremen..... | 6-11 |
| Article 647, Subcontracted Radiological Control Technicians..... | 6-12 |
| Part 5, Other Radiological Training..... | 6-12 |
| Article 651, Management Training..... | 6-12 |
| Article 652, Technical Support Personnel | 6-13 |
| Article 653, Planners..... | 6-13 |
| Article 654, Radiological Control Personnel..... | 6-13 |
| Article 655, Radiographers and Radiation Generating Device Operators..... | 6-14 |
| Article 656, Emergency Response Personnel | 6-15 |
| Part 6, Training For Special Applications..... | 6-15 |
| Article 661, Plutonium Facilities | 6-15 |
| Article 662, Uranium Facilities..... | 6-15 |
| Article 663, Tritium Facilities..... | 6-15 |
| Article 664, Accelerator Facilities | 6-15 |

RADIOLOGICAL CONTROL MANUALIdentifier: PRD-183
Revision: 7
Page: 6-2 of 6-15**CHAPTER 6, TRAINING AND QUALIFICATION****Part 1, Radiological Control Training and Qualification****Article 611, Purpose**

The provisions of this chapter ensure that individuals are trained to work safely in and around radiological hazards and to maintain their individual radiation exposure and the radiation exposures of others ALARA. Training provisions in this chapter apply to individuals entering controlled areas at the facility/project and other individuals who are responsible for developing and implementing radiological control measures.

Article 612, Standardization

Requirements are established in 10 CFR 835.901 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. In [the RCM this manual](#), these training programs are referred to as General Employee Radiological Training (GERT) and Radiological Worker I and II training, 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. In establishing local training programs, DOE core courses will be used to the extent practicable and supplemented with Site-specific information.

1. Radiation safety training programs are necessary to ensure compliance with 10 CFR 835.901. Training programs for members of the public, general employees, and radiological workers will be developed consistent with Parts 2, 3, and 6 of this chapter to ensure compliance with these requirements. Additional training programs consistent with those discussed in Parts 5 and 6 of this chapter may be necessary to provide appropriate compliance with the education, training, and skills requirements of 10 CFR 835.103. Affected individuals may include, but not be limited to, managers, supervisors, technical specialists, researchers, clerks, and engineers.
2. [DOE Core course training material for DOE](#), Site-specific training materials, or other equivalent courses are used when required to satisfy the training requirements of both 10 CFR 835.901 and 10 CFR 835.103. [The development of standardized courses have been sponsored by DOE for DOE standardized courses that are available include:](#)
 - a. General Employee Radiological Training.
 - b. Radiological Worker I and II training.
 - c. Radiological Control Technician training.
 - d. Radiological Assessor training.
 - e. Radiological Support Personnel training.
 - f. Radiological Control Training for Supervisors.
 - g. Higher-Level Training for Supervisors.

RADIOLOGICAL CONTROL MANUAL

Identifier: PRD-183
Revision: 7
Page: 6-3 of 6-15

- h. Radiological Safety Training for Plutonium Facilities.
 - i. Radiological Safety Training for Tritium Facilities.
 - j. ALARA Training for Technical Support Personnel.
 - k. Radiological Safety Training for Radiation Producing Devices.
 - l. Radiological Contamination Control Training for Laboratory Research.
 - m. Radiological Safety Training for Uranium Facilities.
 - n. Radiological Safety Training for Accelerator Facilities.
3. Successful completion of the entire core academic component of a DOE core course at one DOE site within the past 2 years normally will be recognized. Allowances also may be made for individuals who have successfully completed other types of radiological control training. Documentation of previous training should include the individual's name, date of training, topics covered, and name of the certifying official. However, under these circumstances, any additional radiological control training necessary for the individuals to perform radiological work or to enter specific areas, including Site-specific aspects of the radiation safety training, shall be completed [see 10 CFR 835.901(c)]. Site-specific training for GERT and Radiological Worker I and II training may be included with other Site orientation training.
4. At sites ~~where~~ with multiple facilities, ~~the~~ training may be facility-specific if personnel access is limited to those facilities for which training has been completed.

Article 613, General Provisions

1. Radiation 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, including prenatal radiation exposure, to radiation and radioactive materials [see 10 CFR 835.901(c)(1)].
 - b. Basic radiological fundamentals and radiation protection concepts [see 10 CFR 835.901(c)(2)].
 - c. Physical design features, administrative controls, limits, policies, procedures, alarms, and other measures implemented at the facility to manage doses and maintain doses ALARA, including both routine and emergency actions [see 10 CFR 835.901(c)(3)].
 - d. Individual rights and responsibilities as related to implementation of PLN 260 [see 10 CFR 835.901(c)(4)].
 - e. Individual responsibilities for implementing ALARA measures [see 10 CFR 835.901(c)(5)].
 - f. Individual exposure reports that may be requested [see 10 CFR 835.901(c)(6)].

RADIOLOGICAL CONTROL MANUAL

Identifier: PRD-183
Revision: 7
Page: 6-4 of 6-15

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 [see 10 CFR 835.901(b)]. Table 3-2 provides guidance about the level of training appropriate for each defined area. Examinations and performance demonstrations shall be used to demonstrate satisfactory completion of initial radiological worker training [see 10 CFR 835.901(b)]. Examinations shall be used to demonstrate satisfactory completion of biennial Radiological Worker I training and any additional training provided to address significant changes in radiation protection policies and procedures, and Radiological Worker II training conducted every 2 years to provide for significant changes to the radiation protection program [see 10 CFR 835.901(e)]. Examinations should be written, unless, the Radiological Control director approves alternatives to accommodate special needs. Alternative examinations will be equivalent in content to written examinations. The examination process will require the following:
 - a. Exclusion of true/false questions and open-book examinations.
 - b. Use of questions randomly selected from the question bank.
 - c. Acknowledgment by signature that the student participated in a post-examination review.
 - d. Measuring of competence in required skills using performance-based examinations.
 - e. Remedial actions for failure to meet the minimum score.
 - f. Use of question bank questions that test what the student is expected to remember months after the training rather than to test short-term memory of theoretical material.
3. Training will 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 [see 10 CFR 835.901(e)]. This biennial training conducted every 2 years should not be limited to subjects with which the students are already familiar, but will include applicable lessons learned and topics that will increase the students' knowledge of radiological hazards and controls. Training also shall be provided to affected individuals when a significant change has been made to the radiation protection program [see 10 CFR 835.901(e)]. Changes to the radiation protection program will be incorporated into the training program on a periodic basis.
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. Appropriate measures include electronic databases or wallet-sized training certificates that identify current training status.
6. Site-specific training and refresher 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.

RADIOLOGICAL CONTROL MANUAL

Identifier: PRD-183
Revision: 7
Page: 6-5 of 6-15

7. Verification of the effectiveness of radiation safety training should be accomplished by evaluating workers in the workplace, generally accomplished during the management self-assessment program. This verification is in addition to performance evaluations routinely performed by facility training departments. The results will be documented and may be used to identify the need for remedial training.
8. Training programs developed for radiation safety should meet the requirements for performance-based training.
9. Reading and comprehension skills in the English language are generally necessary for radiation safety training. The Radiological Control director 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. Training in an alternate language should be equivalent to training in English. The alternative measures should be sufficient to ensure that the affected individuals can respond appropriately to any audible or visible 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 Radiological Control director.
10. Additional requirements for personnel training are established in DOE O 5480.20A, "Personnel Selection, Qualification, and Training for DOE Nuclear Facilities."
11. The Site Radiological Control director or designee will concur in radiation safety training material.
12. Requirements and guidance for training records and course documentation are provided in Article 725.

Article 614, Instructor Training and Qualifications

1. All instructors should be qualified in accordance with the ~~Site contractor~~ Instructor Qualification Program or possess equivalent qualifications. Training also may be conducted by Radiological Control management to provide feedback, lessons learned, or expectations.
2. Instructors should have the technical knowledge, experience, and instructional skills required to fulfill their assigned duties.
3. Instructors-in-training should be monitored by a qualified instructor.
4. 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

A summary of the employee activities requiring GERT is provided in Table 3-2. While, in special cases, escorted access to controlled areas is allowed without completing the training, however, facility/project employees should complete GERT to ensure that they are personally aware of the hazards and controls associated with access to controlled areas.

RADIOLOGICAL CONTROL MANUAL

Identifier: PRD-183
Revision: 7
Page: 6-6 of 6-15

Article 621, Site Personnel

1. Site general employees shall complete radiation safety training prior to unescorted access to controlled areas and prior to receiving occupational radiation exposure during access to controlled areas [see 10 CFR 835.901(a)]. This training shall address the radiation 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 [see 10 CFR 835.901(a)].
2. General Employee Radiological Training will include DOE core course training materials, as applicable, and will be expanded to include Site-specific information such as Site-specific radiation types, alarm responses, and policies.
3. Site general employees may challenge GERT core knowledge requirements by passing a comprehensive examination. If unsuccessful in one attempt, the entire GERT standardized core training should be completed. Challenges should not apply to the Site-specific portions.
4. Additional training beyond GERT should be required for unescorted entry into radiological buffer areas or areas posted for radiological control other than controlled areas. As stated in Table 3-2, GERT is adequate for unescorted entry in radiologically controlled areas where an individual is likely to receive less than or equal to 0.1 rem in ~~a~~ year. ~~and i~~n radiological buffer areas, GERT should be supplemented with completion of training and practical demonstration of conducting a proper self-survey with beta-, gamma-, and alpha-contamination monitoring instrumentation.
5. Information may be communicated by classroom lecture, videotape, or other appropriate methods.
6. To complete requalification training during alternate years, the GERT and Radiological Worker I and II newsletter should be distributed for self-study.
7. When Radiological Control management has approved the use of an escort 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 requirements of PLN-260 [see 10 CFR 835.901(d)].

Article 622, Radiological Safety Training and Orientation for Members of the Public

1. Members of the public shall receive radiation safety training prior to being permitted unescorted access to controlled areas [see 10 CFR 835.901(b)]. This training shall address the radiation 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 [see 10 CFR 835.901(a)].
2. The facility/project will continuously escorts members of the public in controlled areas. 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:

RADIOLOGICAL CONTROL MANUAL

Identifier: PRD-183
Revision: 7
Page: 6-7 of 6-15

- a. Prior approval by the Radiological Control director.
 - b. Appropriate limitations on the areas to be entered and the activities to be undertaken to prevent occupational exposure.
 - c. Enhanced training ~~for the members of the public~~ to provide 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 controlled areas and are ~~escorted~~ 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. ~~M~~Responsibilities for radiation safety for members of the public and management responsibilities for radiation safety.
 - d. Adherence to radiological posting and labeling.
 - e. Applicable emergency procedures.
 - f. Training for issuance of dosimeters, where applicable.
 - g. Verification that the personnel have not recently received medical treatment including radiopharmaceuticals that could impair radiological control surveys.
4. Information may be communicated by classroom lecture, videotape, or other appropriate methods. An examination is not required.
5. Sign-in logs may be used as radiation safety training and orientation records as required by Article 725.

Part 3, Radiological Worker Training

A summary of the employee activities requiring radiological worker training is provided in Table 3-2. ~~While, i~~n special cases, escorted access ~~to controlled areas~~ is allowed without completing the training, however, facility/project employees should complete it to ensure that they are personally aware of the hazards and controls associated with access to radiological areas.

Article 631, General Provisions

1. Each individual shall demonstrate knowledge of the radiation 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 [see 10 CFR 835.901(b)].

RADIOLOGICAL CONTROL MANUAL

Identifier: PRD-183
Revision: 7
Page: **6-8** of 6-15

- Radiological worker training will include the DOE core course training materials, as applicable, and ~~has been expanded to include~~ Site-specific information.
2. Workers may challenge DOE 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 will be completed. Challenges will 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 radioactive contamination.
 5. Individuals with current Radiological Worker I training may be upgraded to allow unescorted access to other areas by completing only the additional training provided in Radiological Worker II training.
 6. To complete requalification training during alternate years, the GERT and Radiological Worker I and II newsletter should be distributed for self-study.
 7. 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 PLN-260 [see 10 CFR 835.901(d)].

Article 632, Radiological Worker I

1. Site-specific Radiological Worker I initial training and High/Locked High/Very High Radiation Area training (see Article 632.3) 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, if applicable.
 - c. Proper response to alarm situations.
2. Course length will vary depending on the amount of Site-specific material.
3. Unescorted worker access to high, ~~locked high~~, and very high radiation areas may be permitted upon successful completion of Radiological Worker I training and High/Locked High/Very High Radiation Area training. Individuals who complete this training will not be allowed to enter contamination, high contamination, or airborne radioactivity areas unescorted, nor will they be allowed to enter soil contamination areas during activities that will disturb the soil.
4. Performance demonstrations may be ~~waived~~ requested by an individual or required by a manager during Radiological Worker I requalifications ~~conducted every 2 years~~.

~~Note: Non-Site Radiological Worker I qualifications normally will not include High/Locked High/Very High Radiation training.~~

RADIOLOGICAL CONTROL MANUAL

Identifier: PRD-183
Revision: 7
Page: 6-9 of 6-15

Article 633, Radiological Worker II

1. Site-specific 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 high 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.
2. Course length will vary depending on the amount of Site-specific material.
3. Performance demonstrations may be ~~waived~~ requested by an individual or required by a manager during Radiological Worker II requalifications ~~conducted every 2 years~~.

Article 634, Specialized Radiological Worker Training

Specialized radiological worker training should be completed ~~for nonroutine work~~, involving special controls for radiological hazards. This training is in addition to Radiological Worker II training and will be provided to personnel 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 and walkthroughs provide an acceptable alternative to specialized radiological worker training. The need for specialized radiological worker training will be determined by the facility/project performing the work, with the assistance from the Radiological Control organization and the training department.

Part 4, Radiological Control Technician and Radiological Control Technician Foreman Qualification**Article 641, General Provisions**

Training and qualification of RCTs and ~~their RCT~~ foremen will address routine operations and also focus on recognizing and handling situations in both normal and changing radiological conditions. Newly qualified technicians and those still in training should be given the opportunity to work with qualified, experienced technicians to foster development.

Article 642, Radiological Control Technician

1. Because of the nature of their duties (e.g., monitoring the workplace, implementing administrative controls and entry controls), RCTs would generally be expected to have responsibility for implementing measures necessary for ensuring compliance with 10 CFR 835. Therefore, RCTs generally will be subject to the education, training, and

RADIOLOGICAL CONTROL MANUAL

Identifier: PRD-183
Revision: 7
Page: 6-10 of 6-15

- skills requirements of 10 CFR 835.103. Training for RCTs will include the standardized core course training materials, as applicable, which will be expanded to include Site-specific information.
2. **Candidates for RCT training** **RCT candidates** who have prerequisite knowledge such as college credit, registration by the National Registry of Radiation Protection Technologists, operational experience, or related qualifications may satisfy individual sections of the standardized core course training requirements by passing comprehensive challenge examinations.
 3. Entry-level prerequisites should be established to ensure that RCTs meet the standards for physical condition and education. At a minimum, these standards should include the following:
 - a. High school education or equivalency.
 - b. Fundamentals of mathematics, physics, chemistry, and science.
 - c. Systems and fundamentals of process, operations, and maintenance.
 - d. Reading and comprehension level sufficient to follow procedures, write RWPs, prepare survey maps, write reports, and prepare shipping and transfer paperwork.
 - 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. All RCTs are encouraged to pursue registration by the National Registry of Radiation Protection Technologists.

Article 643, Qualification Standards for Radiological Control Technicians

Qualification standards define the requirements for demonstrating completion of training. Signatures on the forms in qualification standards provide documentation of satisfactory knowledge and proficiency.

1. The qualification standards from the standardized core course will be supplemented to include Site-specific elements.
2. Qualification standards for RCTs will include on-the-job training to provide hands-on experience directly applicable to the job.

Article 644, Oral Examination Boards

The use of oral examination boards provides an opportunity to identify areas of strengths and weaknesses related to the performance of RCT duties and **RCT** foremen functions. Using oral examination boards also provides the opportunity to identify additional training requirements to enhance RCT and **RCT** foremen training programs. The functions and composition of the oral examination boards are described below.

RADIOLOGICAL CONTROL MANUAL

Identifier: PRD-183
Revision: 7
Page: 6-11 of 6-15

1. An oral examination board will determine the initial qualification for RCT and RCT foreman positions.
2. The Radiological Control director or designee will designate the board members and appoint a chairperson.
3. The board constituted to evaluate RCT qualifications should be composed of at least three people including an RCT foreman, a Radiological Control staff member, and a line management operations department supervisor or staff member, as applicable. Instructors of RCTs may participate as nonvoting members.
4. The board will assess the candidate's response to normal and emergency situations. Questions should be of the type not normally covered in a written examination. Written examination results will be evaluated during preparation for the board.
5. The board constituted to evaluate RCT foreman qualifications will not include peers or subordinates as voting members.

Article 645, Continuing Training

1. Following initial qualification, RCTs will begin a 2-year cycle of continuing training required for requalification.
2. Requalification should include completion of continuing training including practical training and satisfactory performance on quarterly written examinations. A final oral examination board or direct work observation may be used. Requalification of RCTs and RCT foremen registered with the National Registry of Radiation Protection Technologists may be extended to allow completion of oral exam or direct work observation every 4 years.
3. Continuing training will provide improvement in the knowledge and skills of RCTs.
4. Continuing training will include Site-specific and DOE-wide changes in requirements and updates of lessons learned from operating experience and industry events.
5. Continuing training will include written examinations as applicable, demonstrations of proficiency controlled by qualification standards, and oral or practical examinations as required to complete requalification conducted every 2 years.
6. Infrequently performed tasks such as those for emergency response may require annual training. Other tasks may require training prior to initiation.

Article 646, Radiological Control Technician Foremen

1. Because of the nature of their duties, RCT foremen generally are considered subject to the education, training, and skill requirements of 10 CFR 835.103. In addition, training and education standards for RCT foremen should be consistent with DOE-STD-1107-97.
2. Supervisory and leadership capabilities are recommended for RCT foremen to direct the work of RCTs; interact effectively with crafts, line supervisors, professional staff, and managers; and be able to respond and direct others in emergency and abnormal situations.

RADIOLOGICAL CONTROL MANUAL

Identifier: PRD-183
Revision: 7
Page: 6-12 of 6-15

3. All RCT foremen should participate in training conducted in accordance with Article 645, and their knowledge of facility radiological control hazards, programs, and procedures should be reassessed every 4 years.
4. Initial oral examination boards or direct work evaluations should focus on the ability to analyze situations and supervise subordinates. The RCT foremen's depth of knowledge should exceed that expected of an RCT.

Article 647, Subcontracted Radiological Control Technicians

1. Because their responsibilities closely parallel those of Site contractor RCTs, subcontracted RCTs generally are considered subject to the education, training, and skill requirements of 10 CFR 835.103 and should have the same knowledge and qualifications required of Site contractor RCTs performing the same duties. To obviate the need for full training as an RCT, the training and qualification program will include the following:
 - a. Review of resumes to identify RCTs with experience in jobs similar to those for which they will be employed.
 - b. Written examination to verify appropriate knowledge level.
 - c. Approval of the duties RCTs will be authorized to perform by the facility Radiological Control manager's signature on the qualification documents.
 - d. Training in facility procedures and equipment associated with the authorized duties.
 - e. Training on recent operating experience.
 - f. Ongoing observation of on-the-job performances by the RCT foreman.
2. Subcontracted RCTs who work at a facility for extended time periods (more than 6 months) should receive continuing training commensurate with their assigned duties. Completion of an initial oral examination in accordance with Article 643644 is encouraged. Subcontracts for RCT service normally should be obtained from companies with an established RCT training and qualification program.

Part 5, Other Radiological Training**Article 651, Management Training**

1. Training and education standards for line managers of radiation protection programs (or elements of those programs) should be consistent with DOE-STD-1107-97.
2. Line managers who manage, supervise, or provide oversight of radiation protection programs generally are considered subject to the education, training, and skill requirements of 10 CFR 835.103 and should be knowledgeable in the principles of [the RCMthis manual](#).
3. Such training will be based on DOE core course training materials supplemented by Site-specific procedures and will be completed by new personnel prior to formally assuming line supervision and management responsibilities. This training should include the following:

RADIOLOGICAL CONTROL MANUAL

Identifier: PRD-183
Revision: 7
Page: 6-13 of 6-15

- a. Guidance on handling personnel interactions.
- b. Emphasis on being factual.
- c. Fundamentals of communicating risks.
- d. Importance of keeping management informed.

Article 652, Technical Support Personnel

Appropriate technical support personnel (such as engineers, schedulers, and procedure writers) may be considered subject to the education, training, and skill requirements of 10 CFR 835.103 and should be trained in the ALARA fundamentals and dose reduction techniques. They also should participate in selected portions of job-specific and specialized training, particularly in situations using mockups.

Article 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 are defined as personnel who develop detailed radiological work plans and are required to complete Radiological Worker II training. Planners will be subject to the education, training, and skill requirements of 10 CFR 835.103.~~ Planners will receive training consistent with DOE-HDBK-1110-97, "ALARA Training for Technical Support Personnel," in accordance with 10 CFR 835.103.

Article 654, Radiological Control Personnel

1. Radiological Control senior staff (see Article 143) and management generally are considered subject to the education, training, and skill requirements of 10 CFR 835.103 and should have:
 - a. A combination of education and experience commensurate with their job responsibilities.
 - b. Periodic training based on an assessment of job responsibilities to maintain and enhance proficiency.
 - c. Periodic 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, instrument calibration technicians, medical personnel, record clerks, whole-body-counter technicians, and laboratory personnel. Radiological support personnel generally are considered subject to the education, training, and skill requirements of 10 CFR 835.103 and should have:
 - a. Applicable training on standardized core course topics from Radiological Worker I and II and Radiological Control Technician Training and additional job-specific topics.
 - b. Training appropriate to the tasks to be performed.

RADIOLOGICAL CONTROL MANUAL

Identifier: PRD-183
Revision: 7
Page: 6-14 of 6-15

- c. Continuing training to provide continued improvement in knowledge and skills.
3. Training and education standards for Radiological Control senior staff and support personnel should be consistent with DOE STD-1107-97.
4. Certification and involvement with professional industry organizations are encouraged.

Article 655, Radiographers and Radiation Generating Device Operators

1. Radiographers generally are considered subject to the education, training, and skill requirements of 10 CFR 835.103 and should have training in accordance with 10 CFR 34.43.
 - a. Facility and operation managers should ensure that industrial radiographers are trained initially as required by the NCRP Report No. 61, *Radiation Safety Training Criteria for Industrial Radiography* (NCRP 1978). On the job and annual retraining shall be performed in accordance with NCRP 61, Sections 3.3.2 and 3.3.3. Training also should include periodic reviews of case histories of radiography accidents. The training records shall be maintained as required by Article 725.
 - b. Non-Site contractor radiographers and their assistants who provide services in facility/project areas shall provide certification of their training. Adequate training may be demonstrated by providing documented evidence of being trained in accordance with NCRP 61, or by being named as a qualified user for the proposed task on Nuclear Regulatory Commission license or a current agreement state license, or by providing documented evidence of being trained in accordance with such a license. The facility or operations manager should be provided with this documentation and should maintain a list of certified radiographers.
2. Radiation generating device operators not performing radiography generally would be considered subject to the education, training, and skill requirements of 10 CFR 835.103 and will have training appropriate for the radiation source involved and commensurate with the level of hazard.
 - a. Personnel operating cabinet x-ray systems such as those used by mailroom clerks and security are subject to the requirements of 21 CFR 1020.40. These personnel are not required to ~~complete Radiological Worker training to be radiation workers solely to~~ operate these devices.
 - b. X-ray users (except as noted elsewhere in ~~the RCM~~this manual) shall be at least Radiological Worker I trained. Facility or operations managers shall ensure that operators of x-ray-producing equipment are trained initially and ~~twice a every 2~~ twice a every 2 years thereafter in the fundamentals of x-ray safety, use of radiation detection instrumentation (including dosimeters) for their x-ray equipment and facility, x-ray inspection, maintenance and record-keeping procedures, and operations and emergency procedures.

RADIOLOGICAL CONTROL MANUAL

Identifier: PRD-183
Revision: 7
Page: 6-15 of 6-15

Article 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 from both on-Site and off-Site locations, may be required to work in radiological areas.
2. Each individual authorized to perform emergency actions likely to result in occupational doses exceeding the values of the limits provided in Table 2-1 shall be trained and briefed beforehand on the known or anticipated hazards to which the individual will be subjected [see 10 CFR 835.1302(d)].
3. Such training will be based on DOE radiological worker core course and Site-specific training materials.
4. If such workers are not trained, trained escorts will be assigned.
5. Training will make it clear that lifesaving has priority over radiological controls.
6. Records of this training will be maintained.

Part 6, Training For Special Applications**Article 661, Plutonium Facilities**

The content of DOE-HDBK-1145-2001, "Radiological Safety Training for Plutonium Facilities," will be considered in addition to DOE core training materials at plutonium facilities.

Article 662, Uranium Facilities

The content of DOE-HDBK-1113-98, "Radiological Safety Training for Uranium Facilities," will be considered in addition to DOE core training materials at uranium facilities.

Article 663, Tritium Facilities

The content of DOE-HDBK-1105-2002, "Radiological Training for Tritium Facilities," will be considered in addition to DOE core training material at tritium facilities.

Article 664, Accelerator Facilities

The content of DOE-HDBK-1108-2002, "Radiological Safety Training for Accelerator Facilities," will be considered in addition to DOE core training material at accelerator facilities.