

Radiological Control Technician Training
Practical Training Phase II



Coordinated and Conducted
for
Office of Environment, Safety & Health
U.S. Department of Energy

This page intentionally left blank.

Course Developers

William Egbert	Lawrence Livermore National Laboratory
Dave Lent	Coleman Research
Michael McNaughton	Los Alamos National Laboratory
Bobby Oliver	Lockheed Martin Energy Systems
Richard Cooke	Argonne National Laboratory
Brian Thomson	Sandia National Laboratory
Michael McGough	Westinghouse Savannah River Company
Brian Killand	Fluor Daniel Hanford Corporation

Course Reviewers

Technical Standards Managers	U.S. Department of Energy
Peter O'Connell	U.S. Department of Energy
William D. Ulicny	ATL International, Inc.

This page intentionally left blank.

Table of Contents

	Page
Introduction	1
Development of Job Performance Measures (JPMs)	1
Conduct Job Performance Evaluation	3
 Qualification Area: Radiological Instrumentation	 5
Task 2-1	5
Objective	5
Materials Needed	5
Abnormal Conditions	5
Personnel/Equipment Safety	5
Prerequisite Training	5
Knowledge Requirements	6
Comments	6
Performance Requirements	7
 Task 2-2	 7
Objective	7
Materials Needed	7
Abnormal Conditions	7
Personnel/Equipment Safety	7
Prerequisite Training	8
Knowledge Requirements	8
Comments	8
Performance Requirements	8
 Qualification Area: Radiological Protection	 9
Task 3-1	9
Objective	9
Materials Needed	9
Abnormal Conditions	9
Personnel/Equipment Safety	9
Prerequisite Training	9
Knowledge Requirements	10
Comments	11
Performance Requirements	11

DOE-HDBK-1122-99

Task 3-2 11
 Objective 11
 Materials Needed 11
 Abnormal Conditions 11
 Personnel/Equipment Safety 11
 Prerequisite Training 12
 Knowledge Requirements 12
 Comments 13
 Performance Requirements 13

Task 3-3 13
 Objective 13
 Materials Needed 13
 Abnormal Conditions 13
 Personnel/Equipment Safety 14
 Prerequisite Training 14
 Knowledge Requirements 14
 Comments 15
 Performance Requirements 15

Task 3-4 15
 Objective 15
 Materials Needed 16
 Abnormal Conditions 16
 Personnel/Equipment Safety 16
 Prerequisite Training 16
 Knowledge Requirements 16
 Comments 16
 Performance Requirements 17

Task 3-5 17
 Objective 17
 Materials Needed 17
 Abnormal Conditions 17
 Personnel/Equipment Safety 17
 Prerequisite Training 18
 Knowledge Requirements 18
 Comments 18
 Performance Requirements 18

DOE-HDBK-1122-99

Task 3-6 18
 Objective 19
 Materials Needed 19
 Abnormal Conditions 19
 Personnel/Equipment Safety 19
 Prerequisite Training 19
 Knowledge Requirements 20
 Comments 20
 Performance Requirements 20

Qualification Area: Emergency Preparedness 21

Task 4-1 21
 Objective 21
 Materials Needed 21
 Abnormal Conditions 21
 Personnel/Equipment Safety 21
 Prerequisite Training 21
 Knowledge Requirements 21
 Comments 22
 Performance Requirements 22

Task 4-2 22
 Objective 22
 Materials Needed 23
 Abnormal Conditions 23
 Personnel/Equipment Safety 23
 Prerequisite Training 23
 Knowledge Requirements 23
 Comments 23
 Performance Requirements 24

Task 4-3 24
 Objective 24
 Materials Needed 24
 Abnormal Conditions 24
 Personnel/Equipment Safety 24
 Prerequisite Training 24
 Knowledge Requirements 25
 Comments 25
 Performance Requirements 25

DOE-HDBK-1122-99

Task 4-4 25
 Objective 25
 Materials Needed 26
 Abnormal Conditions 26
 Personnel/Equipment Safety 26
 Prerequisite Training 26
 Knowledge Requirements 26
 Comments 27
 Performance Requirements 27

Task 4-5 27
 Objective 27
 Materials Needed 27
 Abnormal Conditions 27
 Personnel/Equipment Safety 28
 Prerequisite Training 28
 Knowledge Requirements 28
 Comments 28
 Performance Requirements 28

Introduction

Development of Job Performance Measures (JPMs)

The DOE suggested task worksheets are provided as a guide to develop Job Performance Measures (JPMs). These guides provide information on tasks common to many sites. Each site must complete a documented job evaluation to validate core and site specific tasks. JPMs should be developed following the DOE Guide to Good Practices and the Training Accreditation Program (TAP) manuals. All tasks identified in the job evaluation should be included in the overall practical training program.

1. The format of the JPM is flexible and should be tailored to each site and task as appropriate. Each JPM should include all the elements listed on the DOE suggested Task Worksheets.
2. All "Critical" task elements shall be identified on the JPM. A critical task element is defined as any element of the task that is deemed crucial to the satisfactory performance of the task. An element may be critical if its omission or improper execution:
 - a. Causes or could cause a serious injury or dangerous situation
 - b. Causes or could cause damage to any system or component to the extent that it prevents the system or component from being immediately available for its intended purpose
 - c. Results in incomplete task performance
 - d. Violates security
 - e. Results in an out of tolerance condition or measurement which prevents the equipment from meeting facility procedures or specifications
 - f. Violates a standard maintenance procedure such as improper use of test equipment or hand tools, etc. (this does not include performing procedure steps out of sequence)
 - g. Causes excessive delay(s) due to unnecessary troubleshooting, removal or replacement of components, or rejection of serviceable equipment.

Continued Next Page

Introduction (continued)

**Development of
Training/Evaluation
Standards (continued)**

3. The instructor should list the questions the student will be asked before, during, and after the performance evaluation to confirm the student has the knowledge to perform the task in a safe and efficient manner.
4. The instructor shall list the steps the student must perform in order to pass the performance evaluation. Methods of accomplishment should be designated for each task. There are four possible methods of accomplishment.
 - P Perform the specified task using approved procedures and observing all applicable safety and administrative requirements. This includes a thorough discussion (usually prior to performing the task) addressing safety implications, elements involved, the effects on associated equipment or systems, and abnormal situations which may arise while performing the task. This method of accomplishment is the most desirable level for performance testing.
 - S Simulate performance of the specific task. Using approved procedures, "walk through" the task and simulate all actual manipulations (valves, switches, tools, etc.) an employee would perform. Describe applicable safety and administrative requirements and the parameters (meter readings, charts, measurements, etc.) an employee would observe/monitor during actual performance of the task. Conduct the same discussion as required for a perform signature.
 - O Observe an individual performing the specified task. Conduct the same discussion as required for a perform signature.
 - D Discuss the specified task using applicable procedures and discussions as required to perform the task. Demonstrate knowledge of the task by describing the manipulations required and the parameters that may be expected to change. This method of accomplishment is the least desirable for performance testing.

Continued Next Page

Introduction (continued)

**Development of
Training/Evaluation
Standards (continued)**

5. Simulate, observe, and discuss should be used only when perform is not feasible, such as in a high radiation area.
 6. Job Performance Evaluations shall be conducted by a trainer/evaluator who has received training in on-the-job training and/or evaluation techniques.
-

**Conduct Job Performance
Evaluation**

1. The student should request an evaluation from a trainer/evaluator.
 2. The trainer/evaluator reviews the appropriate documentation
 - a. Qualification standards
 - b. Standard operating procedures
 - c. Applicable Training Evaluation/Standard
 3. The trainer/evaluator verifies student prerequisites
 - a. Student has completed on-the-job training
 - b. Student has had adequate practice time
 4. The trainer/evaluator schedules the evaluation as time and facility conditions permit.
 5. The trainer/evaluator at the beginning of the evaluation, will as a minimum, provide the student with the following:
 - a. Ground rules (clear, complete instructions)
 - b. Review of task steps, if necessary
 - c. Review of acceptable performance standards and criteria
 6. The trainer/evaluator asks questions to verify the student's knowledge as required by the procedure, Training Evaluation/Standard, or qualification standard before the student is allowed to operate equipment. Once the instructor is sure the student understands the task, the student is allowed to perform it.
-

Continued Next Page

Introduction (continued)

Conduct Job Performance Evaluation (continued)

7. All performed or simulated steps must be accomplished without coaching from the trainer/evaluator.
8. Each step should have a grading system to indicate satisfactory or unsatisfactory completion.
9. Students shall have access during the evaluation to all tools, equipment/instruments, procedures, reference materials, and other assistance that would normally be available during task performance.
10. The trainer/evaluator may ask the student questions before, during, and after the evaluation to confirm the student's understanding and comprehension.
11. Any action or answer which would place the plant, system, or personnel in danger is an immediate cause for issuing an unsatisfactory performance evaluation, regardless of the acceptability of other actions and answers. The trainer/evaluator must be prepared to take control of the process at any point where the student's course of action would jeopardize the safety of personnel or equipment.
12. When the performance evaluation has been completed, the trainer/evaluator shall sign, date, and indicate on the JPM a final Satisfactory or Unsatisfactory decision. The student will also sign the JPM. Comments may be added by both the trainer/evaluator and student.

Qualification Area: Radiological Instrumentation Area Next

Qualification Area: Radiological Instrumentation

Task 2-1 Complete a response check on portable hand held instruments.

Objective Given each type of count rate and exposure/dose rate portable hand held instrument specific to your facility, a source, and documentation, complete a response test to assure proper operation of each instrument in accordance with facility procedures.

(Each site must determine the following:)

- ☞ Initial Conditions
 - ☞ Site Specific References
 - ☞ Initiating Cues
 - ☞ Standards
-

Materials Needed Each type of portable contamination and radiation survey instrument at your facility, source(s), and documentation

Abnormal Conditions Instrument not operable, cold temperatures, altitude corrections, static, magnetic, radio-frequency, etc.

Personnel/Equipment Safety Electrical, radiological

Prerequisite Training Fundamental Academics Training
Site Academics Training:
Lesson 2.01 - Radiological Documentation
Lesson 2.08 - Radioactive Source Control
Lesson 2.16 - Radiation Survey Instrumentation
Lesson 2.17 - Contamination Monitoring Instrumentation

Continued Next Page

Qualification Area: Radiological Instrumentation (continued)

Knowledge Requirements

- ☞ 1. Locate the applicable reference/operating procedure(s).
- ☞ 2. Discuss site procedures for control of instrument check sources that are not integral to the instrument.
- ☞ 3. State whether the instrument is a count rate or exposure/dose rate instrument.
- ☞ 4. State the documentation required for response testing of portable radiological instruments.
- ☞ 5. State which isotopes are used to response check beta/gamma count rate instruments, alpha count rate instruments, and exposure/dose rate instruments.
- 6. State required frequencies of response checks
- 7. Discuss how to determine the proper source to use for response checks.
- ☞ 8. Discuss how each instrument is positioned on the source for response checks.
- ☞ 9. Discuss ALARA concerns to consider during response checking portable dose rate instruments.
- ☞ 10. Discuss the documentation of response check results.
- ☞ 11. Discuss operational checks completed during a response check of portable radiological instruments.
- 12. Discuss out of tolerance conditions and associated actions if encountered.

Comments

Classroom or OJT lessons to support the above requirements should be developed by each site to meet their individual needs. Some information is provided in the site academic lesson plans referenced.

Continued Next Page

Qualification Area: Radiological Instrumentation (continued)

Performance Requirements To be determined by the facility

Task 2-2 Complete a performance test on radiation detection counting equipment.

Objective Given each type of scaler specific to your facility, applicable references and equipment, complete a performance test and establish operating parameters in accordance with operating procedures.

(Each site must determine the following:)

- ☞ Initial Conditions
 - ☞ Site Specific References
 - ☞ Initiating Cues
 - ☞ Standards
-

Materials Needed Each type of scaler at your facility, calculator, source documentation

Abnormal Conditions Instrument not operable, scaler settings inappropriate for conditions, high background, sample drawer contamination, depletion of purge gas

Personnel/Equipment Safety Electrical, radiological

Continued Next Page

Qualification Area: Radiological Instrumentation (continued)

Prerequisite Training

Fundamental Academics Training
Site Academics Training:
Lesson 2.01 - Radiological Documentation
Lesson 2.03 - Counting Errors and Statistics
Lesson 2.19 - Counting Room Equipment

Knowledge Requirements

- ☞ 1. Locate the applicable reference/operating procedure.
 - ☞ 2. Explain the types of tests performed.
 - ☞ 3. State the required frequencies of performance tests.
 - ☞ 4. Explain the pre-operational checks performed prior to tests.
 - ☞ 5. Discuss counter lower limit of detection/minimum detectable activity, as applicable.
 - ☞ 6. Explain the purpose of counter reliability tests, e.g., the Chi-squared test and interpret test results, including out of tolerance results.
 - ☞ 7. Explain efficiency test and interpret results.
 - ☞ 8. Discuss out of tolerance conditions and associated actions when encountered.
 - ☞ 9. Explain the documentation requirements.
-

Comments

Classroom or OJT lessons to support the above requirements should be developed by each site to meet their individual needs. Some information is provided in the site academic lesson plans referenced.

Performance Requirements

To be determined by the facility

Qualification Area: Radiological Protection Next

Qualification Area: Radiological Protection

Task 3-1

Perform a contamination survey.

Objective

Given applicable materials and an actual or simulated contamination area, perform a contamination survey and properly interpret the results for personnel protection, in accordance with facility procedures.

(Each site must determine the following:)

- ☞ Initial Conditions
 - ☞ Site Specific References
 - ☞ Initiating Cues
 - ☞ Standards
-

Materials Needed

Smears, wipes (including large area wipes as applicable), instruments, documentation.

Abnormal Conditions

Contamination outside of a controlled area, contamination in excess of posted limits, wet areas, uneven or porous surfaces, instrument contamination/failure

Personnel/Equipment Safety

Heat stress, cold stress, radioactive contamination, high noise areas, etc.

Prerequisite Training

Fundamental Academics Training
Site Academics Training:
Lesson 2.01 - Radiological Documentation
Lesson 2.05 - Contamination Control
Lesson 2.17 - Contamination Monitoring Instrumentation

Continued Next Page

Qualification Area: Radiological Protection (continued)

Knowledge Requirements

- ☞ 1. Locate the applicable reference/operating procedure.
- ☞ 2. State when the various types of removable contamination surveys are required.
- ☞ 3. State the size of area to smear, and the smear media used, when performing the various types of removable contamination surveys.
- ☞ 4. State how the results are reported when performing a removable contamination survey.
- ☞ 5. Explain how to differentiate between fixed and removable contamination.
- ☞ 6. Explain how to conduct a direct scan survey for both beta/gamma and alpha contamination.
- ☞ 7. Explain how to convert from cpm to dpm for the instruments used in the survey.
- ☞ 8. Explain how to convert from cpm/probe area to dpm/100 cm² for the instruments used in the survey.
- ☞ 9. State the 10 CFR 835 contamination limits for Contamination and High Contamination Areas applicable to the site, based on the isotopes of concern.
- ☞ 10. State actions to take when contamination is found in excess of expected or allowable limits.
- ☞ 11. State how area survey results are communicated to personnel entering the area.
- ☞ 12. State site criteria for when a routine area radiological survey requires an update to the radiological status board.

Continued Next Page

Qualification Area: Radiological Protection (continued)

Comments Classroom or OJT lessons to support the above requirements should be developed by each site to meet their individual needs. Some information is provided in the site academic lesson plans referenced.

Performance Requirements To be determined by the facility

Task 3-2 Perform radiation surveys.

Objective Given each dose rate survey instrument specific to your facility and an actual or simulated radiation area, perform a radiation survey to establish personnel beta, gamma, and neutron dose rates (as applicable) to assure personnel doses do not exceed allowable limits.

(Each site must determine the following:)

- ☞ Initial Conditions
 - ☞ Site Specific References
 - ☞ Initiating Cues
 - ☞ Standards
-

Materials Needed Survey instrument(s), documentation

Abnormal Conditions Instrument failure/saturation, ion-chamber filled with radioactive gas, unexpected high levels of radiation

Personnel/Equipment Safety Unexpected high radiation fields

Continued Next Page

Qualification Area: Radiological Protection (continued)

Prerequisite Training

Fundamental Academics Training
Site Academics Training:
Lesson 2.01 - Radiological Documentation
Lesson 2.11 - Radiological Work Coverage
Lesson 2.16 - Radiation Survey Instrumentation

Knowledge Requirements

- ☞ 1. Locate the applicable reference/operating procedure.
- ☞ 2. Describe the appropriate instruments for surveying a radiation field.
- ☞ 3. Explain the additional documentation used as background information for the area to be surveyed.
- ☞ 4. State the different types of radiation that may be detected by each instrument used in the survey.
- ☞ 5. Define general area, contact dose rate, hot spot, and streaming radiation.
- ☞ 6. State how beta and gamma dose rates are normally obtained and reported when using an ion-chamber survey instrument (RO-2 or equivalent).
- 7. State the 10 CFR 835 limits for Radiation, High Radiation, and Very High Radiation Areas.
- ☞ 8. Explain actions to be taken if abnormal conditions are encountered.
- ☞ 9. State how area survey results are communicated to personnel entering the area.
- ☞ 10. State site criteria for when a routine area radiological survey requires an update to the radiological status board.

Continued Next Page

Qualification Area: Radiological Protection (continued)

Comments Classroom or OJT lessons to support the above requirements should be developed by each site to meet their individual needs. Some information is provided in the site academic lesson plans referenced.

Performance Requirements To be determined by the facility.

Task 3-3 Obtain air samples.

Objective Given a portable air sampler, applicable equipment, documentation, and a designated area assigned by the examiner, obtain an air sample, interpret the results by calculating the air activity, and implement personnel controls in accordance with facility procedure.

(Each site must determine the following:)

- ☞ Initial Conditions
 - ☞ Site Specific References
 - ☞ Initiating Cues
 - ☞ Standards
-

Materials Needed Portable air sampler, filter, gloves, pump, extension cord, additional misc. equipment

Abnormal Conditions Detection of airborne activity above site limits, malfunctioning air sampler, hazardous or restricted environments, filter dust-loading, inappropriate filter media

Continued Next Page

Qualification Area: Radiological Protection (continued)

Personnel/Equipment Safety

Electrical, explosive environment, use of samplers around water

Prerequisite Training

Fundamental Academics Training
Site Academic Training:
Lesson 2.01 - Radiological Documentation
Lesson 2.03 - Counting Statistics
Lesson 2.06 - Air Sampling Program/Methods
Lesson 2.18 - Air Sampling Equipment
Lesson 2.19 - Counting Room Equipment

Knowledge Requirements

- ☞ 1. Locate the applicable reference/operating procedure.
 - ☞ 2. State the types of assemblies and filter media available for use at your facility and the purpose for each.
 - ☞ 3. State the types of airborne contaminants that may be sampled and the methods for collection and counting.
 - ☞ 4. Identify major components and controls of each air sampler.
 - ☞ 5. Discuss the operation of each type of air sampler.
 - ☞ 6. List and explain when an air sample should be taken.
 - ☞ 7. Describe how to take an air sample.
 - ☞ 8. List the minimum volume of air to be sampled for each type of sample.
 - ☞ 9. Determine the Minimum Detectable Activity of an air sample.
 - ☞ 10. Determine activity on the sample media.
-

Continued Next Page

Qualification Area: Radiological Protection (continued)

**Knowledge Requirements
(continued)**

- ☞ 11. Calculate an air activity concentration given the necessary information.
 - ☞ 12. List plant specific limiting isotopes and the air concentrations of each requiring respiratory protection.
 - ☞ 13. Determine Radon/Thoron activity.
 - ☞ 14. State actions taken in the event of detected airborne contamination in excess of expected or allowable limits.
-

Comments

Classroom or OJT lessons to support the above requirements should be developed by each site to meet their individual needs. Some information is provided in the site academic lesson plans referenced.

Performance Requirements

To be determined by the facility.

Task 3-4

Perform a leak test on a radioactive source.

Objective

Given a radioactive source and materials, perform a leak test on the source in accordance with facility procedure.

(Each site must determine the following:)

- ☞ Initial Conditions
 - ☞ Site Specific References
 - ☞ Initiating Cues
 - ☞ Standards
-

Continued Next Page

Qualification Area: Radiological Protection (continued)

Materials Needed Instruments, smears, documentation, tongs, if applicable

Abnormal Conditions Lost source, contaminated/leaking source

Personnel/Equipment Safety High radiation, contamination

Prerequisite Training Fundamental Academics Training
Site Academics Training:
Lesson 2.01 - Radiological Documentation
Lesson 2.08 - Radiolactive Source Control
Lesson 2.17 - Contamination Monitoring Instrumentation
Lesson 2.19 - Counting Room Equipment

- Knowledge Requirements**
- ☞ 1. Locate the procedure for completing this task.
 - ☞ 2. Discuss the safety precautions used when performing this task.
 - ☞ 3. State the requirements for the source to be considered satisfactory (not leaking).
 - ☞ 4. State the documentation requirements.
-

Comments Classroom or OJT lessons to support the above requirements should be developed by each site to meet their individual needs. Some information is provided in the site academic lesson plans referenced.

Continued Next Page

Qualification Area: Radiological Protection (continued)

Performance Requirements To be determined by facility.

Task 3-5 Post a radiological area to reflect associated hazards.

Objective Given applicable equipment, supplies, and an actual or simulated radiation and contamination area, post the areas to reflect associated hazards to assure proper personnel protection in accordance with facility procedures.

(Each site must determine the following:)

- ☞ Initial Conditions
 - ☞ Site Specific References
 - ☞ Initiating Cues
 - ☞ Standards
-

Materials Needed Instrumentation, barriers (e.g., rope, tape, chain, etc.), signs, protective clothing, ribbons, stantions, documentation, step off pads as appropriate, survey map(s), blank status board as appropriate, instructions for donning and doffing protective clothing instructions for self-survey as appropriate

Abnormal Conditions Action that would require an emergency response, contamination in an uncontrolled area

Personnel/Equipment Safety Improperly posted areas, possible internal and external contamination, restricted access for emergency egress

Continued Next Page

Qualification Area: Radiological Protection (continued)

Prerequisite Training

Fundamental Academics Training

Site Academics Training:

Lesson 2.05 - Contamination Control

Lesson 2.10 - Access Control and Work Area Setup

Knowledge Requirements

- ☞ 1. Locate the applicable reference procedure.
 - ☞ 2. Discuss facility specific radiological posting requirements (e.g., update, types, limits).
 - ☞ 3. Explain the documentation requirements.
 - ☞ 4. State how area survey results are communicated to personnel entering the area.
 - ☞ 5. State site criteria for when a routine area radiological survey requires an update to the radiological status board.
-

Comments

Classroom or OJT lessons to support the above requirements should be developed by each site to meet their individual needs. Some information is provided in the site academic lesson plans referenced.

Performance Requirements

To be determined by the facility.

Task 3-6

Perform a radioactive material shipment survey.

Continued Next Page

Qualification Area: Radiological Protection (continued)

Objective Given a radioactive material shipment scenario, the student shall perform all radiological surveys necessary to package, ship or receive a radioactive package. Document the results in accordance with applicable shipping limits and facility procedures.

(Each site must determine the following:)

- ☞ Initial Conditions
 - ☞ Site Specific References
 - ☞ Initiating Cues
 - ☞ Standards
-

Materials Needed Instruments, smears, documentation

Abnormal Conditions Performing the survey in adverse weather conditions, radiation/contamination in excess of DOE/site limits, package integrity or inventory in question, radiation/contamination in excess of DOT regulations

Personnel/Equipment Safety Dropping of equipment, climbing

Prerequisite Training Fundamental Academics Training
Site Academics Training:
Lesson 2.01 - Radiological Documentation
Lesson 2.05 - Contamination Control
Lesson 2.08 - Radioactive Source Control
Lesson 2.12 - Shipment/Receipt of Radioactive Material
Lesson 2.16 - Radiation Survey Instrumentation
Lesson 2.17 - Contamination Monitoring Instrumentation

Continued Next Page

Qualification Area: Radiological Protection (continued)

Knowledge Requirements

- ☞ 1. Locate and discuss the procedures used for the packaging, shipping and receipt of radioactive material.
 - ☞ 2. Explain the appropriate equipment for shipment packaging and surveys.
 - ☞ 3. Discuss the different types of packaging, and the limits associated with each.
 - ☞ 4. State the survey requirements for each type of package and the necessary documentation required for these surveys.
 - ☞ 5. Define different types of labeling, such as Transportation Index, and explain how they are determined and documented.
 - ☞ 6. Explain the terms Exclusive and Non-Exclusive Use, Open and Closed Transport Vehicles, Low-specific Activity and Limited Quantity, Route Controlled, and the radiological limits associated with these categories.
 - ☞ 7. Explain the labeling required for shipping radioactive material, i.e., White I, Yellow II, Yellow III, LSA, Limited Quantity, and UN Numbers.
 - ☞ 8. Discuss emergency response associated with shipping onsite and offsite.
-

Comments

Classroom or OJT lessons to support the above requirements should be developed by each site to meet their individual needs. Some information is provided in the site academic lesson plans referenced.

Performance Requirements

To be determined by the facility.

Qualification Area: Emergency Preparedness Next

Qualification Area: Emergency Preparedness

Task 4-1 Respond to a high airborne activity alarm (e.g., Continuous Air Monitor alarm).

Objective Given a scenario applicable to your facility, the student must obtain necessary equipment and material to properly respond to a continuous air monitor (CAM) alarm to demonstrate proficiency in an emergency situation and in accordance with facility emergency procedures.

(Each site must determine the following:)

- ☞ Initial Conditions
 - ☞ Site Specific References
 - ☞ Initiating Cues
 - ☞ Standards
-

Materials Needed As appropriate

Abnormal Conditions Facility specific

Personnel/Equipment Safety Internal contamination, spread of contamination outside of a controlled area, improper ventilation, improper use of respiratory equipment

Prerequisite Training Fundamental Academics Training
Site Academics Training

Knowledge Requirements ☞ 1. Locate the applicable reference/procedure.

Continued Next Page

Qualification Area: Emergency Preparedness (continued)

**Knowledge Requirements
(continued)**

- ☞ 2. State the initial response actions for CAM alarms.
 - ☞ 3. Discuss personal protective equipment used in responding to a CAM alarm.
 - ☞ 4. Discuss potential causes for CAM alarms.
-

Comments

Classroom or OJT lessons to support the above requirements should be developed by each site to meet their individual needs. Some information is provided in the site academic lesson plans referenced.

Performance Requirements

To be determined by the facility.

Task 4-2

Respond to an uncontrolled release of radioactive material (e.g., radioactive spill, stack alarm)

Objective

Given a scenario applicable to your facility, the student must obtain necessary equipment and material to properly respond to a radioactive spill and to demonstrate proficiency in an emergency situation in accordance with facility emergency procedures.

(Each site must determine the following:)

- ☞ Initial Conditions
 - ☞ Site Specific References
 - ☞ Initiating Cues
 - ☞ Standards
-

Continued Next Page

Qualification Area: Emergency Preparedness (continued)

Materials Needed	As appropriate
<hr/>	
Abnormal Conditions	Facility specific
<hr/>	
Personnel/Equipment Safety	External and internal contamination, spread of contamination outside of a controlled area
<hr/>	
Prerequisite Training	Fundamental Academics Training Site Academics Training
<hr/>	
Knowledge Requirements	<ul style="list-style-type: none"> ☞ 1. State the applicable reference/procedure. ☞ 2. State the immediate actions required for a spill. ☞ 3. List the items required to respond to a radioactive spill. ☞ 4. List the primary precautions an RCT must follow when responding to a radioactive spill. ☞ 5. Discuss how the immediate actions differ when the spill involves <i>fissile</i> material. ☞ 6. Discuss how the immediate actions differ when the spill involves dry radioactive material, mixed hazardous material, or fires involving radioactive material.
<hr/>	
Comments	Classroom or OJT lessons to support the above requirements should be developed by each site to meet their individual needs. Some information is provided in the site academic lesson plans referenced.

Continued Next Page

Qualification Area: Emergency Preparedness (continued)

Performance Requirements To be determined by the facility.

Task 4-3 Respond to a radiation alarm (e.g., remote area monitor, area radiation monitor).

Objective Given a scenario applicable to your facility, the student must properly respond to an area radiation monitor and demonstrate proficiency in an emergency situation in accordance with facility emergency procedures.

(Each site must determine the following:)

- ☞ Initial Conditions
 - ☞ Site Specific References
 - ☞ Initiating Cues
 - ☞ Standards
-

Materials Needed As appropriate

Abnormal Conditions Facility specific

Personnel/Equipment Safety High radiation exposure

Prerequisite Training Fundamental Academics Training
Site Academics Training

Continued Next Page

Qualification Area: Emergency Preparedness (continued)

Knowledge Requirements

- ☞ 1. State the purpose of area radiation monitor alarms.
 - ☞ 2. State the locations for the area radiation monitor alarms at your facility.
 - ☞ 3. Locate and discuss the procedure for responding to an area radiation monitor alarm.
 - ☞ 4. Discuss the safety precautions required when responding to an area radiation area monitor alarm.
 - ☞ 5. Distinguish between criticality alarm and area radiation alarm response.
-

Comments

Classroom or OJT lessons to support the above requirements should be developed by each site to meet their individual needs. Some information is provided in the site academic lesson plans referenced.

Performance Requirements

To be determined by the facility.

Task 4-4

Respond to an injured person located in a radiological area.

Objective

Given a scenario applicable to your facility, the student must properly respond to an injury in a radiological area and demonstrate proficiency in an emergency situation in accordance with facility emergency procedures.

Continued Next Page

Qualification Area: Emergency Preparedness (continued)

Objective (continued)

(Each site must determine the following:)

- ☞ Initial Conditions
 - ☞ Site Specific References
 - ☞ Initiating Cues
 - ☞ Standards
-

Materials Needed

As appropriate

Abnormal Conditions

Facility specific

Personnel/Equipment Safety

Biohazards, internal/external exposure, spread of contamination

Prerequisite Training

Fundamental Academics Training
Site Academics Training

Knowledge Requirements

- ☞ 1. State the item of primary concern when an injury occurs in a radiological area.
 - ☞ 2. State the factors that affect the decision to move an injured person in a radiological area.
 - ☞ 3. List the practices to follow when removing a worker that has sustained a minor injury while working in a radiological area.
 - ☞ 4. State radiological responses in a life-threatening situation and a non-life-threatening situation. Compare the responses of radiological control in each.
-

Continued Next Page

Qualification Area: Emergency Preparedness (continued)

Knowledge Requirements (continued)

- ☞ 5. State the factors that affect the decision for exposing rescue personnel.
-

Comments

Classroom or OJT lessons to support the above requirements should be developed by each site to meet their individual needs. Some information is provided in the site academic lesson plans referenced.

Performance Requirements

To be determined by the facility.

Task 4-5

Direct and monitor personnel decontamination.

Objective

Given a scenario applicable to your facility, the student must direct and monitor personnel decontamination and to demonstrate proficiency in an emergency situation in accordance with facility emergency procedures.

(Each site must determine the following:)

- ☞ Initial Conditions
 - ☞ Site Specific References
 - ☞ Initiating Cues
 - ☞ Standards
-

Materials Needed

Instruments, decontamination supplies and chemicals, documentation

Abnormal Conditions

Injury, inadequate decon facilities

Continued Next Page

Qualification Area: Emergency Preparedness (continued)

Personnel/Equipment Safety

Skin irritation, possible injuries

Prerequisite Training

Fundamental Academics Training
Site Academics Training

Knowledge Requirements

- ☞ 1. Discuss the facility specific decontamination supplies and inventory procedures.
 - ☞ 2. List the cleaning agents used for decontaminating skin and hair.
 - ☞ 3. Discuss facility specific policies and procedures for personnel decontamination.
 - ☞ 4. State the actions to be taken in the event that contamination cannot be removed without inflicting damage to body tissue.
 - ☞ 5. State when nasal smears are required to be taken.
 - ☞ 6. Discuss the actions to be taken in the event of suspected internal contamination.
 - ☞ 7. Identify cleansing agents used for nasal irrigations as applicable.
-

Comments

Classroom or OJT lessons to support the above requirements should be developed by each site to meet their individual needs. Some information is provided in the site academic lesson plans referenced.

Performance Requirements

To be determined by the facility.
