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Model Training Curriculum for Low-Level Radioactive Waste Disposal Facility Operations

National Low-Level Waste Management Program

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ABSTRACT

This document is to assist in the development of the training programs required to be in place for the operating license for a low-level radioactive waste disposal facility. It consists of an introductory document and four additional appendixes of individual training program curricula. This information will provide the starting point for the more detailed facility-specific training programs that will be developed as the facility hires and trains new personnel and begins operation.

This document is comprehensive and is intended as a guide for the development of a company- or facility-specific program. The individual licensee does not need to use this model training curriculum as written. Instead, this document can be used as a menu for the development, modification, or verification of customized training programs.

EXECUTIVE SUMMARY

Low-level radioactive waste disposal facilities require a license from the U.S. Nuclear Regulatory Commission (NRC) or an Agreement State licensing agency. The NRC Agreement State program transfers the NRC licensing authority to a state if it meets NRC programmatic standards.

License applications for low-level radioactive waste disposal facilities must include a description of the proposed training programs for facility personnel. This document includes an example of the suggested content for the training section of the license application in Section 1. Although the license application includes a description of the training programs, these descriptions are not comprehensive enough to develop and implement training programs at a facility. Therefore, in addition to the suggested content for the application, a comprehensive training curriculum for facility employees makes up the largest portion of this document.

Section 2 of the model curriculum includes key areas for consideration related to the overall procedures for managing training programs at a facility. Four appendixes include proposed requirements and training program content for specific job positions. This model curriculum can be used by individuals that have limited experience in training program development, facilities with limited resources for training development, or individuals that want to verify if basic training program content is included in existing programs.

A Facility Operations Manual, or its equivalent, normally details the procedures and training programs for specific positions at low-level radioactive waste disposal facilities. This model is provided on computer diskette to allow the user to easily customize the curriculum and incorporate it into the Facility Operations Manual. Redline notations in the curriculum indicate areas that a user may want to modify with facility-specific terminology or requirements. Once the curriculum is changed, the redline code must be removed prior to printing the final company manual.

ACRONYMS

The following is a list of abbreviations and acronyms used throughout this document. In addition, each is spelled out when first presented within the text.

AA	affirmative action
AC	alternating current
ALARA	as low as reasonably achievable
CFR	Code of Federal Regulations
DC	direct current
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
EEO	Equal Employment Opportunity
FOM	Facility Operations Manual
FS	facility supervision
GED	general equivalency diploma
GEO	General Employee Orientation
HP	health physicist
HPT	health physics technicians
HR	human resources
HVAC	heating, ventilating, and air conditioning
INEL	Idaho National Engineering Laboratory
JPM	job performance measure
LLW	low-level radioactive waste
MSDS	Material Safety Data System
NLLWMP	National Low-Level Waste Management Program

NRC	Nuclear Regulatory Commission
OJT	on-the-job training
OS	operations specialist
OSHA	Occupational Safety and Health Administration
QA	quality assurance
RWI	Radiological (Radiation) Worker Training I
RWII	Radiological (Radiation) Worker Training II
RWP	radiological (radiation) work permit
SAR	safety analysis report
SAT	Systems Approach to Training
TS	technical support
VT	Visitor Training
VTO	Visitor Training and Orientation

CONTENTS

ABSTRACT iii

EXECUTIVE SUMMARY v

ACRONYMS vii

1. MODEL LICENSE APPLICATION FOR TRAINING 1

2. TRAINING CURRICULUM 11

2.1 Purpose 11

2.2 Background 11
2.2.1 NUREG-1199 Section 8.3 Requirements 11
2.2.2 NUREG-1220 12

2.3 Application 12
2.3.1 Training Program Goals and Assumptions 13
2.3.2 Quality Assurance and Training Program Management Policy 14
2.3.3 Model Curriculum Development Background 15
2.3.4 Model Curriculum Contents 15
2.3.5 Model Curriculum Modifications 15
2.3.6 Word Processing Information 16
2.3.7 Training Program Vision Statement 16
2.3.8 Training Program Responsibilities 17
2.3.9 Training Program Entry Requirements 18
2.3.10 Training Waiver Policy 20
2.3.11 Specialized Training and Certifications 21
2.3.12 Onsite Experience Requirements 22
2.3.13 Continuing Training Program 22
2.3.14 Training Effectiveness Evaluation 23
2.3.15 Facility Training Personnel 25
2.3.16 Sample Training Matrix 26
2.3.17 Position (Job) Task Analysis 30
2.3.18 Work While Under Instruction 31
2.3.19 Training Program Documentation and Records Requirements 31
2.3.20 Scheduling of Training 32
2.3.21 Training Program Forms 33
2.3.22 Job Performance Measures 33
2.3.23 Training Program Future Considerations 34
2.3.24 Summary 34

Attachment 1

NUREG-1199 37

Attachment 2

Job Performance Measure Sample Format 41

Attachment 3

Facility Lesson Outline Sample Format 51

Appendix A—Operations Specialist Training Program A-1

Appendix B—Health Physics Technician Training Program B-1

Appendix C—Facility Supervision Training Program C-1

Appendix D—Facility Operations Support Training Program D-1

TABLES

1. Training schedule in months prior to facility operations 6

2. The facility individual performance task versus the specific training requirements of task 27

Model Training Curriculum for Low-Level Radioactive Waste Disposal Facility Operations

1. MODEL LICENSE APPLICATION FOR TRAINING

Low-level radioactive waste (LLW) disposal facilities developed by host states must apply for and receive an operating license from the U.S. Nuclear Regulatory Commission (NRC) or Agreement State agency prior to receiving the first shipments of radioactive waste. The criteria for the license application process are described in Title 10 Code of Federal Regulations (CFR) Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

The specifications for the training portion of the license application are outlined in the NRC publication, "Standard Format and Content of a License Application for a Low-Level Radioactive Waste Disposal Facility," Section 8.3, Training Program (see Attachment 1, NUREG-1199). The license application requires functional descriptions and commitments regarding the projected facility training programs. However, it is generally left to the Facility Operations Manual (FOM) or its equivalent to prescribe the detail of training programs and procedures adopted by the LLW disposal facility. Detailing the training program and procedures in an FOM allows the facility to make minor changes in the training program without having to amend the facility operating license.

This document was originally intended to include only the training material normally found in an FOM. During the review of the document, several individuals suggested that an example of the training section of the license application be included in addition to the detailed curriculum. Therefore, what follows are the functional objective requirements of NUREG-1199, Section 8.3, Training Program, listed below with suggested facility verbiage to meet those requirements. Redlined notation suggests facilities should enter company specific information.

"The applicant should describe the training and retraining programs for the facility staff and the scheduling of these programs. The program descriptions should include the following:" (NUREG-1199)

Requirement 1.

"The proposed subject matter of each course, the duration of the course (approximate number of weeks in terms of full-time attendance), the organization teaching the course or supervising instruction, and the position titles of the persons who will be taking the course." (NUREG-1199)

Suggested Content to Meet Requirement 1.

The FOM Section XXX contains training matrixes that include the subject matter for each lesson, the titles of those attending the training, and the organization responsible for instruction. After facility study and modifications, the training matrixes will determine the level of effort required to develop fully functional training programs. The subject matter of each individual program is described as follows:

Operations Specialist. This program contains three separate subject matter areas: Academic Training, Core Practical Training, and Facility-Specific Practical Training. Trainees will normally complete all training for this program in XXX weeks.

1. Academic Training consists of a series of lessons covering the basic academic skills and fundamentals needed to form the foundation for additional training. Examples in this area include basic mathematics and science, chemistry, radiation detection and protection, and physics. These lesson topics are designed to refresh and reinforce the knowledge and skills from previous schooling, training, and experience.

2. Core Practical Training consists of a series of lessons covering basic introductory concepts of facility system and component operation, actions for various generic abnormal conditions and alarms, radiation protection, etc. These lesson topics provide generic background training in how the facility functions without going into extreme detail of facility-specific information. In addition, it provides the Operations Specialist with the knowledge and skills to perform the normal day-to-day tasks required of the position.

3. Facility-Specific Practical Training consists of a series of lessons covering actual facility operation and use of procedures for all Operations Specialist-designated tasks at the facility. These lesson topics also cover the specific actions required as part of the facility emergency and off-normal procedures as applicable.

Health Physics Technician. This program contains three separate subject matter areas: Academic Training, Core Practical Training, and Facility-Specific Practical Training. Trainees will normally complete all training for this program in XXX weeks.

1. Academic Training consists of a series of lessons covering the basic academic skills and fundamentals needed to form the foundation for additional training. Examples in this area include basic mathematics and science, chemistry, radiation detection and protection, and physics. These lesson topics are designed to refresh and reinforce the knowledge and skills from previous schooling, training, and experience. In addition, this area provides the generic training required of health physics technicians.

2. Core Practical Training consists of a series of lessons covering basic introductory concepts of health physics technician generic tasks. These lesson topics provide generic background training in these tasks without going into extreme detail of facility-specific information. In addition, it provides the health physics technician with the knowledge and skills to perform the normal day-to-day tasks required of the position.

3. Facility-Specific Practical Training consists of a series of lessons covering the use of procedures for all health physics technician-designated tasks at the facility. These lesson topics also cover the specific actions required as part of the facility emergency and off-normal procedures, as applicable, and the facility programs for radiation control and protection.

Facility Supervision. This program contains three separate subject matter areas: Supervisory Skills Training, Department Practical Training and Facility-Specific Practical Training. Trainees will normally complete all training for this program in XXX weeks.

1. Supervisory Skills Training consists of a series of lessons covering the basic academic skills and fundamentals needed to form the foundation for additional training. In addition, this area of training includes leadership and supervisory skills, verbal and written skills, and related supervisory skills. These lesson topics are designed to refresh and reinforce the knowledge and skills from previous schooling, training, and experience.

2. Department Practical Training consists of a series of lessons covering basic concepts of operation of the facility departments including the documentation and responsibility requirements, department procedures and programs, work control procedures, and quality assurance instructions. In addition, it provides facility supervisory personnel with the knowledge and skills to perform the normal day-to-day tasks required of their position.

3. Facility-Specific Practical Training consists of a series of lessons covering actual facility operation and use of procedures specifically directed to all shift manager-designated tasks at the facility. These lesson topics also cover the specific actions required as part of the facility emergency and off-normal procedures.

Facility Operations Support. This program contains three separate training programs with individual subject matter areas as follows: General Employee Training—General Employee Orientation, Radiological (Radiation) Worker Training I and Radiological (Radiation) Worker Training II; Visitor Training and Orientation—Visitor Training and Orientation; and Technical Support—Academics Training and Facility-Specific Practical Training.

1. General Employee Training

   - General Employee Orientation consists of a series of lessons covering the basic facility orientation knowledge needed by all facility employees as they are hired. This training forms the foundation for all facility additional training. Examples in this area include basic radiation detection and protection security requirements, emergency plan, first aid and CPR, safety, and communications systems. These lesson topics are all facility-specific information and are normally completed within 2 days.

   - Radiological (Radiation) Worker I consists of a series of lessons covering the basic radiation worker knowledge and skills required of the majority of facility personnel. This includes radiological controls fundamentals, exposure limits, and radiation monitoring equipment. Generally, this training is completed within 2 hours.

   - Radiological (Radiation) Worker II consists of a series of lessons reinforcing and expanding on the basic radiation worker knowledge and skills from Radiological (Radiation) Worker I as required for specialized facility applications. New topics

for this area include respirator training, radiological emergencies, area postings, and protective clothing. Generally, this training is completed within 4 hours.

2. Visitor Training and Orientation

   - Visitor Training and Orientation consists of a series of lessons designed to orient the casual facility visitor to facility-specific requirements in such areas as security, radiation protection, visitor/escort procedures, and safety. This training is completed within 1 hour.

3. Technical Support

   - Academic Training consists of a series of lessons covering the basic academic skills and fundamentals needed to form the foundation for additional training to be received later by designated facility Technical Support personnel. Examples in this area include basic mathematics and science, chemistry, radiation detection and protection, and physics. These lesson topics are designed to refresh and reinforce the knowledge and skills from previous schooling, training, and experience. This training is normally completed in 1 week.

   - Facility-Specific Practical Training consists of a series of lessons covering actual facility operation and use of procedures for all designated facility Technical Support personnel. These lessons are subdivided into the various Technical Support categories such as clerical, security, and engineering. This training is normally completed in 1 week.

Note to license application author: See the individual training program appendixes for more specific information.

Requirement 2.

"A commitment to conduct an onsite formal training program and on-the-job training (OJT) so that the entire facility staff will be qualified before the initial receipt of radioactive waste." (NUREG-1199)

Suggested Content to Meet Requirement 2.

The facility has a complete formalized training program in place and will have fully certified the majority of facility personnel in their designated positions before the scheduled date of initial receipt of radioactive waste.

The facility has committed the time and effort required to have these training programs developed and in place as early as possible after the initial employment of training support personnel. See Table 1.

- The training program, as developed, meets or exceeds all applicable training requirements included in federal regulations, state laws and company policy; provides to all facility personnel initial certification and continuing training; enables facility personnel to perform their assignments in a safe, efficient manner complying with all applicable requirements; and provides opportunity for job enrichment and personal growth.

Note to license application author: See Section 2.3.7 for optional vision statements.

Requirement 3.

"Plans for conducting a position task analysis for all operating personnel in which the tasks performed by the person in each position are defined and the training, in conjunction with education and experience, is identified to provide assurance that the tasks can be effectively performed." (NUREG-1199)

Suggested Content to Meet Requirement 3.

Facility personnel have analyzed tasks for all positions in conjunction with entry level education and experience using a verification task analysis method. Facility personnel (management, supervision, subject matter experts, and trainers) used the *Model Training Curriculum for Low-Level Radioactive Waste Disposal Facility Operations*, DOE/LLW-220, as the basis for its task analysis. Each position was compared with the model's proposed entry level requirements, task lists, and outlines for each task lesson. Based on these reviews, management modified the requirements in the model to meet facility needs. Specific entry level requirements, task lists, and lesson content for each position are found in Appendixes A through D or appropriate FOM reference.

Requirement 4.

"Procedures for the orientation of incidental site visitors with regard to site safety and radiation protection." (NUREG-1199)

Table 1. Training schedule in months prior to facility operations.

Training program subject area	Preliminary planning/ development completed (months)	Training material development completed (months)	Initial facility personnel training completed (months)	All facility personnel training completed (months)
Operations Specialist (OS) Academics Training	12	9	6	3
OS Core Practical Training	9	6	3	1
OS Facility-Specific Practical Training	9	6	3	1
Health Physics Technician (HPT) Academics Training	12	9	6	3
HPT Core Practical Training	9	6	3	1
HPT Facility-Specific Practical Training	9	6	3	1
Facility Supervisor (FS) Supervisory Skills Training	12	9	6	3
FS Department Practical Training	9	6	3	1
FS Facility Practical Training	9	6	3	1
General Employee Orientation	12	9	6	3
Radiological Worker Training I	12	9	6	3
Radiological Worker Training II	9	6	3	1
Visitor Training & Orientation	9	6	As required	As required
Technical Support (TS) Academics Training	12	9	6	3
TS Facility-Specific Practical Training	9	6	3	1

Suggested Content to Meet Requirement 4.

The facility has a proceduralized visitor training and orientation program designed to brief all nonfacility visitors. The specifics of this training program are described in Section XXX of the FOM and cover the areas of facility layout, security, radiation protection, safety, emergency plan, etc. Facility visitors will be required to complete this training and pass a written examination over the material presented before being allowed access (escorted or unescorted) to the facility.

Note to license application author: See Appendix D for more detailed information on visitor training and orientation.

Requirement 5.

"The proposed means for evaluating the effectiveness of the training program for all employees." (NUREG-1199)

Suggested Content to Meet Requirement 5.

Training evaluation is accomplished at the facility using the following forms.

- Written examinations
- Job performance measures (JPM)
- Oral questioning
- Training feedback forms
- Facility supervision monitoring
- Outside facility monitoring
- Facility performance monitoring

Per Section XXX of the FOM, the facility collects its evaluation data and meets to review the data. Areas for improvement are identified for update and tracked for implementation.

Note to license application author: See Section 2.3.14 for more detailed requirements on facility training effectiveness evaluation.

Requirement 6.

"Any difference in the training programs for individuals on the basis of experience, which should be categorized as follows:

(a) no previous experience

(b) experience at facilities not subject to licensing

(c) experience at comparable facilities." (NUREG-1199)

Suggested Content to Meet Requirement 6.

Each individual training program has specific requirements for waivers from portions of the training program. In general, individuals with no previous experience must attend all of the identified training for their program. Those with experience at facilities not subject to licensing generally are exempt from academic training, such as math and physics fundamentals. Individuals with experience at comparable facilities normally only require facility-specific training. See appropriate section of the FOM for specific exemptions by position.

Note to license application author: See Appendixes A through D for specific exemptions by position.

Requirement 7.

"The applicant should submit a chart showing the schedule for each part of the training program for each position or organizational unit identified in the SAR. The time scale should be relative to expected operation." (NUREG-1199)

Suggested Content to Meet Requirement 7.

Table 1 shows a projected schedule in months prior to the scheduled date of facility operation for each of the subject areas in each of the four training programs. The schedule takes each area from planning and development through the initial and final training of facility personnel. The end result is all facility personnel fully trained and certified no later than one month prior to the scheduled date of operation or first receipt of radioactive waste.

Requirement 8.

"The applicant should show clearly to what extent the training program has been accomplished at the approximate time of the submittal of the application. Contingency plans for additional training should be described in the event operation is significantly delayed from the date indicated in the application." (NUREG-1199)

Suggested Content to Meet Requirement 8.

Note to license application author: By using Table 1 and employee training records, the facility should be able to track the current status of all training programs and the employees in each program and report accordingly in the license application. During the months prior to the initial receipt of radioactive waste, the facility should be able to devote a great deal of time in the training of facility personnel in order to meet the expected date of operation.

If the date of expected facility operation is delayed, the facility will have the continuing training program developed and ready for use. Continuing training programs that will be

implemented if the date of facility operation is delayed will focus on those tasks identified as over-train tasks in individual training program matrixes in Section XXX of the FOM.

Requirement 9.

"The applicant should describe the plans for the retraining of facility personnel, identify the additional position categories on the facility staff for which retraining will be provided, and describe the nature, scope, and frequency of such retraining." (NUREG-1199)

Suggested Content to Meet Requirement 9.

A continuing training program will be established for those facility personnel having completed certification for their designated job. This program will be designed and implemented to maintain and enhance the proficiency of personnel who perform functions associated with safety-related procedures, structures, systems, and components identified in the facility safety analysis report (SAR) as well as General Employee Training and Radiological (Radiation) Worker I and II training.

Continuing training will include (a) significant facility system and component changes, (b) procedure changes, (c) industry operating experience, (d) selected fundamentals with emphasis on seldom-used knowledge and skills necessary to ensure safety, and (e) other training as needed to correct identified performance problems. The facility will tailor the program to its individual needs with a cyclic schedule of continuing training established to ensure each individual is retrained and reevaluated in all areas of initial training (biennially).

Note to license application author: See Appendix A-1.8, B-1.8, C-1.8, and D-1.8 for wording that could be included in this section.

As previously mentioned, these responses to the functional objectives of the training program as required by NUREG-1199 are supported by the more detailed program within each of the appendixes of this curriculum. Prior to submitting the operating license application, the parent company and facility management should verify that each of the specific responses is achievable within the guidelines and projected budgetary constraints of the facility training department. If not, additional efforts must be made to provide more realistic responses within the requirements of NUREG-1199.

2. TRAINING CURRICULUM

2.1 Purpose

The purpose of the *Model Training Curriculum for Low-Level Radioactive Waste Disposal Facility Operations* is to provide state regulatory authorities and managers of disposal operations with information that can be used to develop new training programs, modify existing training programs, or verify the adequacy of existing training programs. Operating management or regulators of these facilities should not feel obligated to adopt all parts of this curriculum. Rather, they can use the information contained in the model to develop or review programs tailored for the specific needs of a facility.

This model provides the foundation for the training and certification programs for employees of LLW disposal facilities. The specific areas covered by the four appendixes of this curriculum include: Facility Supervision, Operations Specialist, Health Physics Technician and Facility Operations Support. The model does not include suggestions for maintenance training programs such as mechanic, electrician, or instrumentation technician, etc.

As much as possible, this curriculum uses current industry terminology and position titles. However, there may be several differences in terminology between this manual and what the facility uses; for example, Health Physics Supervisor versus Radiation Safety Officer. The program developers need to keep in mind that these differences do exist and adjust their program accordingly.

2.2 Background

The Low-Level Radioactive Waste Policy Amendments Act of 1985 requires the U.S Department of Energy (DOE) to provide technical assistance to the compact regions, host states, and unaffiliated states. The Idaho National Engineering Laboratory (INEL) National Low-Level Waste Management Program (NLLWMP) provides technical support to DOE and host states for the development of new disposal facilities.

2.2.1 NUREG-1199 Section 8.3 Requirements

The LLW disposal facilities as developed by the compact regions and host states must make application for and receive an operating license from the NRC or Agreement State prior to construction of a LLW disposal facility. The criteria for the license application process are described in 10 CFR 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

One specific criterion that must be met is the creation of training programs for the initial and continuing training of the LLW disposal facility employees. The specifications for these training programs are outlined in NRC NUREG-1199, "Standard Format and Content of a License Application for a Low-Level Radioactive Waste Disposal Facility," Section 8.3, Training Program (see Attachment 1). This NUREG requires a description of the projected training programs and the scheduling of these programs. In other words, the facility must have a documented plan of

how they will accomplish the training of facility employees for the safe, competent, long-term operation of the facility.

2.2.2 NUREG-1220

It is anticipated that the NRC will use the guidelines of NRC NUREG-1220, "Training Review Criteria and Procedures," for the formal review of the training programs presented by the individual LLW disposal facilities as part of their license application process. This NUREG is based on the Systems Approach to Training. It is designed to provide a training program evaluator with a detailed checklist to follow during the review.

In general the NUREG directs the evaluator to look at five areas. They are:

1. Systematic analysis of the jobs to be performed

2. Learning objectives that are derived from the analysis and that describe desired performance after training

3. Training design and implementation based on the learning objectives

4. Evaluation of trainee mastery of the objectives during training

5. Evaluation and revision of the training based on the performance of trained personnel in the job setting.

NUREG-1220 is designed to evaluate the effectiveness of established commercial nuclear reactor training facilities with a much larger scope than is required at a LLW disposal facility. Some portions of NUREG-1220 will not directly apply; therefore, the LLW disposal facility should direct its efforts toward meeting the requirements of NUREG-1199 as a minimum goal. Future LLW disposal facility audits may look at how the training program is progressing to the guidelines of NUREG-1220 as applicable.

2.3 Application

The remainder of this document is a discussion of how the majority of the requirements of NUREG-1199 can be met using the four training programs (appendixes). This document describes the assumptions made by its developers, the criteria used, the options available to the individual facility, a general idea of the resources required, and specific decision points that must be completed prior to making application for the facility operating license.

In addition, this document provides guidance for the future expansion of the model curricula into fully operational training programs with lesson plans, JPMs, OJT checklists, a validated examination bank, a job (position) task analysis, a continuing training program, and a records or documentation maintenance system. It also provides some recommendations and options for future enhancements to the training programs as time, money, and resources allow.

2.3.1 Training Program Goals and Assumptions

The goals for this model curriculum are listed below:

a. The model curriculum should be as generic as possible to cover the broadest range of facility requirements.

b. The model curriculum should be easily adaptable to the specific, individual facility needs.

c. The lesson outlines in the model curriculum should be written in the form of training objectives allowing easy conversion and expansion into lesson plans.

d. The model curriculum should be set up to allow LLW disposal facility management to make the determination of facility applicability for each given task or lesson.

e. The model curriculum should meet most of the requirements as described in NUREG-1199 for the facility operating license application process. For those requirements that are not fully met, the model should provide the guidance necessary for the facility to either meet the requirement in the future or to request a waiver of the requirement. Specifically, this waiver is the development of a job (position) task analysis.

f. The model curriculum should cover a range of previous experience levels of the facility employees varying from high school graduates with no experience up through degreed individuals with managerial experience at other LLW disposal facilities.

To achieve these goals, the authors assumed the following:

a. The disposal facility would employ 35 to 70 personnel with no more than 100 at any given facility.

b. The disposal facility would not have the resources to support a full-time training staff. In the best case, the training staff may only include 2 to 3 employees, each with additional collateral duties.

c. The reference material required to develop a detailed training program from the model curriculum is readily available.

d. The facility will only receive LLW in classes A, B, and C as defined in 10 CFR 61, "Licensing Requirements for Land Disposal of Radioactive Waste." This waste is considered the responsibility of the states by the Low-Level Radioactive Waste Policy Amendments Act of 1985.

e. One individual from facility supervision will be designated as the Facility Training Supervisor or equivalent with overall responsibility for the facility training programs. Though this person will most likely have additional collateral duties, it is essential that

the position be staffed by an individual with a strong background in the development and organization of training programs and that the position receive a good deal of attention. This will ensure training program continuity and provide a point of contact for facility as well as regulatory personnel.

f. It is anticipated that the initial staffing at the typical LLW disposal facility will include a core of previously certified key personnel to further develop the work and training organizations. Based on their education and experience, they should require minimal facility-specific training for their certification. Once certified, they will provide the expertise required to develop the training programs and instruction to the remaining inexperienced personnel.

g. The majority of the training will be presented by facility management and supervisory staff with some supporting training being sourced elsewhere within the parent company, equipment vendors, and other support organizations.

2.3.2 Quality Assurance and Training Program Management Policy

For the purposes of the development of this training curriculum, it is assumed that the parent company of the LLW disposal facility has in place a company-wide QA program with a commitment to quality management in all aspects of company operation. The implementation of the QA program at a facility normally includes the training programs.

The quality program provides specifications for personnel assigned to do specific tasks, documents how those tasks are performed, specifies materials and commodities that may be used in the process and is subject to independent third party audits and assurances that all tasks have been satisfactorily accomplished and documented. By reviewing these requirements and the requirements of a facility training program, an overlap if not a redundancy can easily be seen between the two. To minimize potential conflicts and redundancies, the QA and training programs must be integrated into one program as early as possible in the preliminary operating license application process.

The QA standards for facility work instructions provide a great deal of the training program specific requirements. These instructions quite often require certain worker minimum standards for education, experience, and training. These, as well as related requirements, will fall in with the facility training program if the facility designs and executes both programs appropriately.

A comprehensive QA or overall facility quality management program may be developed and implemented with subsections specifying detailed job requirements and work instruction training. The license application may then specify its functional training commitments and reference the detailed training program mandated by the company QA program. The detailed curriculum found in Appendixes A, B, C, and D may be adopted in facility-specific QA work instructions, procedures, and definitions.

2.3.3 Model Curriculum Development Background

This model curriculum was developed at the INEL using information from several sources including commercial nuclear facility training programs, a LLW facility at the INEL, and the DOE. Individuals from Connecticut and Washington reviewed the model to ensure its usability and applicability to host state requirements and regulations for commercial LLW disposal operations.

2.3.4 Model Curriculum Contents

Section 1 contains a model license application for training. Section 2 contains suggested policies and methods for the individual facility to manage the overall training function at a facility. Appendixes A through D contain the suggested task lists, training course outlines, and additional requirements for the Operations Specialist, Health Physics Technician, Facility Supervision, and Facility Operations Support training programs respectively. Currently, the model does not include guidelines for any maintenance-related training programs.

2.3.5 Model Curriculum Modifications

As mentioned previously, the model curriculum contained within this document was developed as a generic model with the intention that each individual facility tailor the model to their specific requirements. Therefore LLW disposal facility managers are not obligated to adopt all parts of the curriculum. Rather, they should use the model as guidance and select only those portions that apply to their facility. With the varied bases for the material contained within this model, some training courses suggested for a DOE facility may not be appropriate for a commercial state-run LLW disposal facility and should be dealt with appropriately. Facility supervision should review this document and all four appendixes of the model curriculum, make modifications, and add and delete courses as appropriate for the expected job assignments at their facility.

If the facility has performed a position (job) and task analysis, it is a simple matter for the LLW Disposal Facility Manager, the Facility Training Supervisor, and Department Supervisors to determine the necessary modifications to the model curriculum.

Facility modifications to the training curriculum are not anticipated to require justification and documentation as part of the license application process. However, the individuals listed above should seriously consider all changes to the curriculum as they are being made and, if possible, should make as many changes as possible prior to any licensing commitments. In addition, as the facility begins operations and the training programs are fully implemented, it may become apparent that further modifications to the training programs will be necessary. The facility should not let the programs stagnate. Instead, they should be active programs that can be modified as the facility needs change and yet within the resource limits of the training department.

2.3.6 Word Processing Information

The model was developed in WordPerfect 6.0 for DOS with a minimum of specialized wordprocessing features (i.e. no two-column format) to enable users to modify the curriculum to meet facility-specific needs and import the document into an existing facility operations manual.

In addition, throughout this document and the four appendixes of the model curriculum, portions of the material are in "redline" which prints as a shaded area. This directs future users of the model to locations where facility-specific information may need to be entered, where material may need to be deleted or otherwise modified, or where background information has been made available to help facility supervision determine the most acceptable option for their facility.

Note: The material that follows should be considered for modification and incorporation into an FOM. In some cases, the text provides only suggested considerations for developing policies rather than specific policies.

2.3.7 Training Program Vision Statement

The majority of the successful operations and training programs within the commercial nuclear industry have well defined code of conduct or vision statements. Typically, these statements have been developed by facility management and training and operations personnel. The code of conduct or vision statements are tied to company policy documents such as the Quality Assurance Plan and Policy, Safety, Regulatory Compliance, etc. They should conform to the style and format of other company vision statements and be used as guides or standards for day-to-day operations as well as during the determination of facility policies, procedures, and programs.

Vision statements that are communicated to and supported by all facility personnel provide a common goal for the facility training staff as well as those personnel receiving the training.

An example set of vision statements is listed below:

- To ensure the training program is cost effective, a small training support staff assists facility management in designing and developing manageable, quality training programs for implementation and presentation to all facility personnel.

- The training program, as developed, meets or exceeds all applicable training requirements included in federal regulations, state laws and company policy; provides to all facility personnel initial certification and continuing training; enables facility personnel to perform their assignments in a safe, efficient manner complying with all applicable requirements; and provides opportunity for job enrichment and personal growth.

- When more than one requirement is applicable, the training programs comply with the most restrictive. When good practices are recommended but not required, these practices are examined in good faith and are implemented when it is clear that they will benefit facility operation.

- Accurate, retrievable records are maintained on all training performed and received, and enables both employees and supervisors to easily verify training status individually, organizationally, or by training subject.

- All facility personnel share in the responsibility for ensuring the training programs are directed towards safe, competent, cost effective operation.

2.3.8 Training Program Responsibilities

Each individual at a LLW disposal facility has some responsibility for training. Because of that, a clear sense of direction must be provided for each facility employee involved in the training effort. These responsibilities must be determined early in the training program development process and should be clearly documented in a facility training policy or equivalent as well as in human resource policies. Each discreet training task need not be documented, rather the categories of the actions required of an employee should be stated. The training responsibilities developed should follow the outline of the facility vision statements and should be flexible enough to allow easy modification as the training programs grow and mature.

The following are examples of training program responsibilities broken down by facility employee groupings.

2.3.8.1 Facility Management. Facility management personnel carry the responsibility to ensure all personnel operate the facility in a safe, competent, efficient manner. Management also maintains the overall responsibility for all aspects of the facility training programs. These aspects include the development, refinement, implementation, and effectiveness of all training presented to facility personnel. Based on the training facility management has received and their program oversight, they direct the appropriate modifications to the training program when it becomes apparent that training is inadequate.

2.3.8.2 Facility Supervision. The facility supervisory staff (Department Supervisors) is responsible for development, implementation, evaluation, certification, documentation, and maintenance of the training programs for the personnel in their departments. In addition, they are responsible to feed back information to the training program and training staff based on the performance of their personnel.

2.3.8.3 Training Staff. The Facility Training Supervisor and those personnel designated as the training staff are responsible for assisting facility management and facility supervision in designing, presenting, and evaluating manageable training programs for all facility personnel. The training staff can also review, revise, and modify current training programs; acquire new training sources to upgrade skills; coordinate the training programs; and maintain the documentation for these programs. The facility QA program specifies the formal requirements for management review and approval of all training programs changes and modifications.

2.3.8.4 All Facility Personnel. Each facility employee is responsible for attending required training, studying required materials, taking examinations, providing feedback to their supervisor or the training staff on the effectiveness of their training, identifying new training needs and ensuring their certifications have not lapsed. Each employee's responsibility for discharging his/her training requirements should be written into their job descriptions and reviewed with them during their periodic performance evaluations.

These responsibilities are given as guidelines and should be modified to meet specific facility position titles and requirements.

2.3.9 Training Program Entry Requirements

Each individual considered for employment by the facility must meet the entry requirements for the training program for that particular job. The training programs covered in this curriculum have differing program entry requirements as described in each of the four appendixes. The following categories generalize these entry requirements.

- Education
- Previous job experience
- Physical standards.

The entry requirements are used as the primary framework upon which the facility training programs will be built and subsequently modified. Because of this, there is a direct correlation between the level of training required versus the level at which new personnel enter a particular training program. Higher, more restrictive entry level requirements normally imply that individuals entering the programs are qualified to perform most of the tasks within the program with the exception of facility-specific information. This situation will require training of a less intensive nature. Lower, less restrictive entry level requirements presuppose that individuals enter the program with minimal skills and knowledge and must receive more detailed, in-depth training.

When identifying the specific training program entry requirements, the facility must compare training costs with the entry level of the personnel being hired. A cost savings is realized when high entry level requirements are identified because the facility will not have to incur the significant costs of developing wide scope training programs. However, establishing higher entry level requirements severely limits the number and type of personnel eligible for employment.

The development of training program entry level requirements should be a combined effort by facility personnel familiar with the tasks, facility management, training staff, and a member of the human resource staff familiar with hiring policies and local demographics. It is not necessary to perform an in-depth analysis of skills and knowledge but rather it is important to generally know the background or skills, physical attributes, and experience levels an individual should have to enter the program. In addition, some preliminary assumptions in each area must be made as follows:

a. If an individual has a high school diploma and passes a prehiring skills examination, it can be assumed that the individual has basic reading, writing, and mathematics skills.

b. If an individual has a bachelor of science degree in engineering or equivalent, it can be assumed that fundamental science and analytical skills exist.

c. If an individual has previous LLW disposal facility, or commercial nuclear power experience, it can be assumed that the individual is familiar with radiation work practices.

Once the skills and knowledge are determined, the facility must look at the funds available to provide training for newly hired personnel for that job. For a facility with a minimal training budget, additional experience, education, or physical attributes would be identified that would reduce the scope of the training program.

If the facility has made a commitment to hire personnel from the local community, they must look at the demographics of the area. The average skills, education, and experience of the worker in that area may determine the entry requirements.

Legal aspects must be taken into account during the development of the hiring process. For example, while deciding on the physical attributes required for entry into a particular training program, the American Disabilities Act requires that the facility accommodate those individuals that can perform the job with minor changes to job design or facilities. Facilities are not required to hire individuals with disabilities that will not allow them to perform the job tasks required. However, an attorney should review the case if hiring demands create a situation that may be challenged. Generally, there will be additional parent company policy considerations available for guidance.

Entry level skills should be found with job descriptions and documented in the company human resources policy manual. From a litigation standpoint, documentation is extremely important because the lack of it can imply that the requirements are different for different people, and that is illegal. From a legal perspective, individuals who make these determinations should be careful to avoid identifying requirements that are not related to the job tasks.

Once entry level requirements are determined, they should not be waived or excepted. For those individuals that lack the entry level requirements to enter a particular training program, facilities may consider offering tuition reimbursement or additional training opportunities that will allow employees to upgrade their skills and knowledge to enter the program. This may be an option for those facilities with a commitment to hire from the local community. However, no employee should be accepted into the program without meeting the entry level standards. Facilities should be careful to avoid offering an employee a position in the program until they have met the necessary requirements. The facility should not develop and offer this training to upgrade an employee's entry level status as this is a costly effort. Thus, the entry level requirements must be chosen with great care in order to retain the greatest flexibility in the hiring of new personnel.

2.3.10 Training Waiver Policy

Each training program in the appendixes of this curriculum identify the entry level requirements to enter that particular program. Some individuals will only meet the entry level requirements and must go through all training for assigned tasks within the program. However, many individuals will have skills and knowledge that exceed the entry level requirements. In these cases, the facility may wish to implement a formalized training waiver policy. This would allow

the employee to obtain certification in a training program without passing through all required training.

Each of the four training appendixes contained within this curriculum provides for the waiver of training requirements by courses or sections of training. This is the easiest and least time-consuming method for dealing with training waivers. However, the facility waiver policy needs the flexibility to waiver individual training requirements as necessary.

As with other portions of the curriculum, the individual facility may consider each of the requirements as the minimum required and may choose to be more restrictive in their particular waiver guidelines.

Most waivers from all or a portion of a training program are expected to be requested and approved when an employee first enters a training program. However, it can also occur at any time during the execution of the program.

When a facility first opens, a core of previously certified personnel may be selected to develop the facility training and operations programs. Based on their education and experience at other facilities, it is anticipated that only facility-specific training will be required for these individuals. In these cases, these first individuals will develop the initial programs and provide training to others. They shall be waived from the training program requirements with the exception of facility-specific training.

The LLW Disposal Facility Manager and Facility Training Supervisor will make the actual waiver determinations and provide the appropriate documentation. Training requirement waivers may be approved if:

a. The requirement is satisfied based on previously documented certifications from other facilities

b. The requirement is satisfied through documented testing or equivalent training obtained elsewhere

c. Additional requirements are met as determined by individual facilities.

The LLW Disposal Facility Manager will have the responsibility for approval of training requirement waivers. These waivers should contain the following:

a. Name of the person requesting the waiver

b. Specific subject, task, training group, or section for which the waiver is requested

c. Justification for the waiver (attach documentation to support the request and approval of the waiver).

Under no circumstances shall any facility personnel be waived from participation in the facility continuing training program.

2.3.11 Specialized Training and Certifications

It is anticipated that the facility will need individual training and certification on special facility equipment and procedures. Due to the individual nature of these training requirements, they are not included within the four training program appendixes. Examples of this type of training include instrument calibration, database entry, new facility instruments and equipment, etc.

Typically, the most cost effective method for meeting these training requirements is by using outside vendors. Where a need for additional training outside of the normal training program is identified, the LLW Disposal Facility Manager and Facility Training Supervisor will jointly determine the scope of training, the needs for this type of training, and a method for the tracking and documentation of these requirements. In addition, vendor training will comply with the training standards set forth in the facility training program procedures.

Vendor training will be reviewed and approved prior to presentation to facility personnel. As a minimum, this review should include topics covered, objectives, qualifications of the instructors, certifications offered, training costs, training methodologies, examination criteria and performance standards and compliance with existing federal and state requirements. This review and approval process will be formally documented.

There are two possibilities for the use of vendor training, onsite and offsite.

1. Onsite vendor training services may include the following:

    - Complete training packages purchased from the vendor for presentation to facility personnel. These would include the lesson plans, training aids, handouts, and examinations.

    - Vendor-supplied instructor training on a subject to allow facility instructors to present the information to facility personnel.

2. Offsite vendor training services may include the following:

    - Complete training packages purchased from and presented by the vendor to facility personnel. These would include the lesson plans, training aids, handouts, and examinations.

    - Workshops, seminars, conferences.

    - Demonstrations of equipment and its use.

For the majority of applications, the overriding concern for the use of onsite versus offsite vendor training services will be the cost differential of sending employees offsite as opposed to bringing the vendor onsite to provide training.

2.3.12 Onsite Experience Requirements

Under certain conditions, the facility may want to impose specific guidelines for minimum time working at the facility before an individual is considered for promotion such as an Operations Specialist to Senior Operations Specialist, Health Physics Technician to Senior Health Physics Technician, or the selection of the facility Department Supervisor, etc. By implementing this policy, the facility will ensure the decision processes are carried out by personnel with a minimum level of facility-specific experience. The individual requirements should not be overly excessive (no more than one year) and should be determined by the LLW Disposal Facility Manager. Once in place, a system for the tracking and documentation of these requirements must be developed and maintained.

2.3.13 Continuing Training Program

After facility personnel have completed certification for their designated job, their training emphasis should shift to a continuing training program. This program shall be designed and implemented to maintain and enhance the proficiency of personnel who perform functions associated with safety-related procedures, structures, systems, and components identified in the facility SAR as well as General Employee Training and Radiological (Radiation) Worker I & II training. In addition, the requirements for this program will be part of the facility operating license and will be directly related to the company or facility QA program.

Continuing training maintains and enhances the skills and knowledge levels acquired in the facility initial training program. It strengthens difficult subject areas and keeps personnel informed of facility modifications, and program and administrative changes. Training should include significant facility system and component changes, procedure changes, industry operating experience, regulatory changes, selected fundamentals with emphasis on seldom-used knowledge and skills necessary to ensure safety, and other training as needed to correct identified performance problems. The specific topics to be covered during each training period will be determined by the LLW Disposal Facility Manager and the Facility Training Supervisor as well as from input received from Department Supervisors and facility employees.

Though each facility should tailor its continuing training program to its individual needs, several things must be considered. A cyclic schedule of continuing training must be established to ensure each individual is retrained and reevaluated in all areas of initial training over some given period (biennially). At the same time, the scheduling must have the flexibility to allow additions based on industry or facility events, procedure changes, personnel requested training, and other items of special interest. Consideration should be given for increased frequency for continuing training on such things as facility abnormal and emergency procedures especially for facility supervision/shift managers and other members of the facility emergency response organization.

The specific training topics selected can be presented using the classroom, self-study, required reading, or JPM formats as applicable for the material and the facility training resources available. Written examinations for continuing training should be administered and documented. Use of emergency exercises conducted in the facility should be considered to enable personnel and operating teams to maintain proficiency in their ability to respond to accident or emergency situations.

Facility policy should be established requiring the attendance and satisfactory completion of continuing training. Participation in the continuing training program should be tracked by the human resources database, which is required by the QA program. A list of individuals who have not met the requirements should be sent to their Department Supervisor. It is the responsibility of the facility Department Supervisors to ensure their personnel satisfactorily complete all facility continuing training.

2.3.14 Training Effectiveness Evaluation

The success of any facility training program depends on the feedback the program receives. The facility training staff must direct some of their limited resources to the establishment of an effective training program evaluation policy. And because of the limited facility training resources, this policy needs to be supported by all facility personnel. Evaluation is the only method to determine if the most effective use is being made of the training budget.

Training effectiveness or feedback takes on several different forms. The most important of which are listed and discussed below:

2.3.14.1 Written examinations. This is an immediate check of the effectiveness of the information as presented to the trainees. Though it does not necessarily check on their ability to use the information, it can provide the feedback on what the trainee remembers and how it was interpreted.

2.3.14.2 Job Performance Measures (JPM). JPMs strengthen the feedback from the written examination by allowing the trainee to use what was taught. With an instructor or supervisor present it also allows immediate correction of trainee mistakes and provides the input for future modifications to the training.

2.3.14.3 Oral Questioning. Though not the best format for formalized evaluation of a training program, it does provide immediate feedback on the trainee's comprehension of the material as presented. If the trainee is having difficulties, such questioning can provide the instructor with a new course to pursue.

2.3.14.4 Training Feedback Forms. It is extremely important that the trainees be provided with a mechanism for providing written feedback to the training program and instructors. This can be done weekly during a course of instruction, at the end of the course, or at other convenient times. The trainees should be encouraged to use these forms, anonymously if need be, and the training staff should provide answers to the trainee concerns when applicable. Training feedback forms should be simple, such as a numbered rating system, with room for written comments.

These forms should be provided to the trainees early in the training to prevent the rush of completion during the last few minutes of a course after the final examination has been given.

2.3.14.5 Facility Supervision Monitoring. The facility should establish a formalized supervision monitoring program for training. All facility supervision should be scheduled into this program for direct, proceduralized monitoring of training sessions including classroom, JPM, OJT, etc. This method of feedback will factor in a point of view of facility personnel who may not see the facility training programs on a daily basis. These individuals should be given formalized training on what to look for while monitoring training as well as a specific checklist that is to be completed and forwarded to the Facility Training Supervisor for action and filing.

2.3.14.6 Outside Facility Monitoring. In an ideal situation, the facility should schedule personnel from outside the facility to monitor the training programs as given in Section 2.3.14.5. Though this may not always be possible, receiving the viewpoint of an outsider can provide feedback on items completely missed by facility personnel. This will allow correction of potential training problems prior to their recognition by regulatory agencies. Typically, the parent company will provide support and audits for all aspects of facility operation including the training program.

2.3.14.7 Facility Performance Monitoring. Though sometimes harder to quantify, close attention to the overall performance and efficiency of the facility operations can point out deficiencies in the training programs. Excessive personnel contamination incidents may be an indicator of problems in the radiological (radiation) worker training, etc. The LLW Disposal Facility Manager and facility supervision should formalize a monitoring program directed specifically at how the training program is impacting facility operations. This can be used to both increase or modify the training in identified areas. Not only will this improve overall facility operation but will make more effective use of the available training resources. Although complex, this is the most important feedback about a facility's training programs.

The effectiveness of a facility training program is disclosed through a variety of ways. Some of the more obvious ways that should be tracked and monitored as an ongoing assessment of the training effort are:

- Lost labor-hours from injuries
- Costs per unit of LLW disposed
- Worker radiation exposure
- Facility decontamination costs
- Equipment breakage and maintenance costs.

Periodically, management, training, and trainees should meet to discuss needed revisions, or updates of the lesson materials. This need not be a lengthy meeting but should focus on those issues of most importance. The results of these meetings and feedback forums should be incorporated into the existing training programs within 2 months.

2.3.15 Facility Training Personnel

The total resources in people, money, and training facilities may be severely limited for the training department. Therefore, it is imperative that the parent company and facility put the best effort possible into the development and implementation of training programs. The ideal way to accomplish this is by selecting and hiring the correct personnel. This must start with a Facility Training Supervisor with a strong training background. This should be followed up with 2 to 3 professional trainers to support the supervisor. The ideal choice for the facility training staff would be individuals from a LLW facility or equivalent with training and operating experience. Initially, this may seem like an excessive number of people for a relatively small number of total facility employees. But, the expenditure is necessary and will be repaid many times over in a successful training program, well-trained facility personnel, and more efficient and safe facility operation.

The most difficult and time-intensive part of any training program is the development portion. For those not familiar with the process, it is not readily apparent that any actual work is being done, and when the finished product is debuted all that is seen is a relatively small amount of paper. The rule of thumb is at least 8 hours of development for each 1 hour of actual trainee contact time.

The selection of professional trainers should be made carefully. One recommendation is to use a contractor group for the initial development and implementation of the training programs. The facility designated trainers would then parallel the contractor effort and eventually take over completely. There are multiple advantages for using a contractor.

a. They can be held accountable for the product they produce and be required to take the training programs past their first outside audit.

b. Contractors have access to professional trainers with a wide range of experience. The facility can then review the training professional prior to making the commitment of hiring.

c. Contractors have several avenues to obtain reference material. The generic makeup of this model curriculum is developed. The contractors can develop the remainder of the curriculum quicker, cheaper, and be held accountable at the same time.

The facility should establish a certification program for trainers. Several such programs currently exist off-the-shelf. In conjunction with certifying the trainers, the facility must ensure the trainers are fully certified on the material they are to teach facility personnel. Eventually, the trainers should be required to participate in and certify for each of the training programs they are to be teaching. This should not be difficult since it is assumed trainers would either be in supervisory positions or have collateral duties in operations. However, the initial group of trainers will require waivers and will meet the certification requirement by teaching only from previously approved lesson plans.

2.3.16 Sample Training Matrix

Each of the four appendixes of this model curriculum contain a training matrix in the format as shown in Table 2. These matrixes are designed to relate the facility individual performance task to the specific training requirements of that task. They also provide guidance on the resources needed to provide the trainees with the information required to allow satisfactory performance of the task. After facility study and modifications, the training matrixes will determine the level of effort required to develop fully functional training programs.

The format of the individual training matrixes found in each appendix of the model curriculum and explanations of the codes used are given as follows.

Table 2. The facility individual performance task versus the specific training requirements of task.

Specific performance task	Training type	Training method	Evaluation method	Lesson plan/ outline number	Training source
SAMPLE MATRIX	ONLY!	-> SEE	INDIVIDUAL	CURRICULUM	VOLUMES

2.3.16.1 Specific Performance Task. This should clearly describe the knowledge or task that must be demonstrated using action verbs. It should not state, "Perform Procedure #000" as this information does not specify an action or task. These tasks should be very specific. Note that this area covers both tasks and knowledge. These tasks and knowledge may be easily developed using the work procedures previously developed for facility operation by the QA program. However, if the QA program has not yet been established, its construction may be simplified by the adoption of the task descriptions in Appendixes A through D.

2.3.16.2 Training Type. This section indirectly describes the difficulty level and safety significance of each task and provides direction as to the type and frequency of training required to safely complete all specified tasks. Each task should be classified in at least one of the following areas.

a. **No-Train (NT)**. These are tasks having a high frequency of performance, low difficulty, low probability of error, low consequence of error, and can be confidently performed with little direct supervision, informal OJT, minimum job experience, or with a simplified job aid or procedure. These will not normally be a part of the training program, consequently the remaining four matrix columns will not be used.

b. **Pre-Train (PT)**. These are tasks that have a low frequency of performance but have significant safety implications. These tasks may require extensive training, which is usually provided only when the task is performed and at no other time.

c. **Train (TR)**. These are tasks having a moderate frequency of performance and moderate consequences from incorrect performance. Proficiency for these tasks can be

maintained by performance of related tasks. Normally, the initial program training is sufficient for continued task performance.

d. **Over-Train (OT)**. These are tasks requiring frequent practice to maintain proficiency. Proper task performance is critical to safety and may cause extreme consequences if incorrectly performed. These tasks generally have a low frequency of performance. Training for these tasks should be ongoing with specific emphasis on upgrading an individual's knowledge just prior to task performance.

2.3.16.3 Training Method. This section describes the method by which the trainee is presented the knowledge required for safe, competent performance of a specific task. The following are the options available for the presentation of training.

a. **Classroom (CR)**. This training method is a formalized, classroom environment with the material presented in a lecture format. It should be used when there is a need to present a large amount of material common to the majority of facility personnel. Examples would be general radiation worker training, facility safety, first aid, etc. Typically, this training method is evaluated by written examination.

b. **Self-Study (SS)**. This training method can be used to back up the information presented in the classroom or to present a specific stand-alone topic. This normally would be used to provide amplifying information on a subject to individual trainees or to smaller specialized facility work groups or departments. Examples include specific radiation monitor training for Health Physics Technicians, fork-lift operation safety, facility security during receipt of radioactive material, etc. Typically, this training method is evaluated by written examination or successful completion of a JPM.

c. **On-The-Job Training (OJT)**. This training method is used as the hands-on means of training an individual in the performance of a specific task. It expands the information presented by the Classroom and Self-Study methods into actions. This involves the step-by-step performance of a single task with direct, individual supervision and training. Examples include the performance of a radiation survey, starting a ventilation fan, completion of the paperwork for receipt of radioactive material, etc. Typically, this training method is evaluated by written examination or by successful completion of a JPM.

2.3.16.4 Evaluation Method. This section describes the different methods for the evaluation of the training methods used for each Specific Performance Task. These evaluations provide feedback on the effectiveness of the training methods as well as a check on the trainee's comprehension, retention, and ability to use the material as presented. This document does not deal specifically with all the advantages and disadvantages of each type of examination. Instead, that is left to the individual facility. The following are the options available for the evaluation of training.

a. **Written Examination (WE)**. This method of evaluation covers all types of written examinations from the informal quiz testing trainee knowledge of an individual idea to a

comprehensive written examination covering the entire course material, the so-called final exam. Written examinations provide several advantages for the evaluation of training including repeatability or the ability to test several trainees to the same level over a long period of time. In addition, written examinations provide easily accessible and auditable documentation on the effectiveness of the training program.

There are several options available when selecting the type of written examination to use to evaluate training. The training personnel need to evaluate the appropriate option to use on a case-by-case basis taking into account (1) the availability of personnel and time to develop and grade the examination, (2) the amount and type of information to be tested, and (3) the specific application of the examination.

b. **Job Performance Measure (JPM)**. This method of evaluation is the best at providing immediate feedback on the effectiveness of a facility training program while evaluating trainee performance of specific tasks. The JPM is relatively easy to develop and grade and can be used as an effective training tool as well. It has the advantage of being a totally reproducible examination that ensures each trainee is examined to the same level of knowledge and the same standards of performance. A sample job format can be found in Attachment 2 of this document.

A subset of the JPM method of evaluation is the Oral Examination. Normally, the oral examination is used as part of all training and evaluation methods but is not a formalized evaluation method. This method of evaluation can be an extremely effective means for making a determination on the effectiveness of a training program. However, the nature of this type of examination leads to problems with repeatability and documentation of the specific questions asked and the responses received. The effort in time and personnel required to develop a valid, reproducible, auditable oral examination easily exceeds that required for a written examination. The individual facility needs to determine the requirements and limitations in using this type of evaluation.

2.3.16.5 Lesson Outline Number. This section cross-references each identified performance task to a lesson outline. This ties the training material directly to each task. It must be noted that several tasks may be covered by one lesson outline. Lesson outlines will be developed to cover all classroom, self-study, and OJT. A sample lesson outline format can be found in Attachment 3 of this document.

A lesson outline is not intended to provide the instructor with all required information. Rather, it provides the basis for future development of more detailed lesson plans. However, in some cases facility trainers may instruct from these outlines. Until these are developed, the lesson outline simply describes the major topics that meet the knowledge and skill requirements for each Specific Performance Task.

2.3.16.6 Training Source. This section assigns and identifies the instructional responsibility for each specific performance task in the training matrix.

a. **Training Department (TRNG)**. This source is normally responsible for the types of training accomplished in the classroom. It ensures the training presented is consistent across all facility personnel.

b. **Trainee's Department (DEPT)**. This source of training is mostly responsible for self-study and OJT. Because this type of training is more task-specific, the individual department is the logical choice for its development and presentation. If the facility size is sufficient to warrant a full-time training staff, they should be able to provide additional support to the individual departments.

c. **Contract Vendor (CONT)**. This source of training may be used as necessary or available to support short-term or task-specific training. Examples of this would be fork lift operator, radiation monitoring equipment, etc. This source of training is reinforced by self-study and OJT at the facility.

2.3.17 Position (Job) Task Analysis

As part of the operating license application process, NUREG-1199 requires the facility to have "plans for conducting a position task analysis for all operating personnel, in which the tasks performed by the person in each position are defined and the training, in conjunction with education and experience, is identified to provide assurance that tasks can be effectively performed." There are many reasons for this requirement, but the basic justification is to ensure the facility has a training program that provides adequate training for only the tasks needed for the safe, competent operation of the facility. The benefit of this requirement is that the facility does not waste time and limited training dollars on development and implementation of unnecessary training programs for tasks that are not needed for facility operation.

Though NUREG-1199 does not require the position task analysis to be completed prior to making application for the facility operating license and the development of the training programs, any effort expended up front on the analysis will reduce the total effort required for program development.

The following is a set of steps for performing an analysis of the facility operations, health physics technician, facility supervision, and technical support personnel using this model curriculum.

a. The first step is to determine the specific training needs for the facility. Initially, this is done by reviewing the regulatory requirements and any existing training programs and by conducting a needs analysis. For the development of a new program, a combination of all three should be used.

   - The applicable federal and state regulatory requirements for the facility should not require any additional analyses for training requirements as these needs analysis have already been done. These requirements need only be included in the training program.

The specific parent company policies for such things as safe conduct of business, inspections, audits, etc., will also need to be analyzed for inclusion in the program.

b. For a new training program, the next step is to develop a valid task list. This is normally called a job analysis.

- This analysis is done by starting with a review of the task matrixes for each position found in Appendixes A through D. Reviewers should add, delete, or modify task descriptions on the matrixes based on facility needs.

- The analysis should be done by current facility personnel (subject matter experts), if possible.

c. The final step is selection of the actual tasks to be trained on and a determination on how the current training material can be used, modified, etc., to train on those specific tasks. Reviewers should add, delete, or modify the lesson outlines found in each of the four Appendixes A through D, until they are confident the lesson content is appropriate for their facility.

2.3.18 Work While Under Instruction

Due to the number of tasks required of each job description, the amount of training required to certify each individual at the facility and the time involved for the entire training process, the facility should develop and implement a policy allowing noncertified individuals to perform tasks for which they have met prescribed requirements. As described in each of the four training program appendixes of this curriculum, such a policy could be as simple as allowing an individual to perform tasks for which training has been received and an evaluation of task performance has been satisfactorily completed. The presence of a certified individual should be required while a noncertified individual is performing any type of safety-related task or equivalent. This allows actual hands-on performance of tasks by the trainee while providing an opportunity for training and evaluation by the certified individual. It still maintains a chain of responsibility for the performance of the task.

2.3.19 Training Program Documentation and Records Requirements

The parent company of a LLW disposal facility is expected to have in place acceptable procedures and policies regarding the documentation and administrative requirements for facility operation. These should be found within the facility QA program or the human resources database. The following is some specific guidance for the facility training programs.

a. Auditable records should be maintained of each individual's participation and performance in, or waivers granted from, the training program(s). The individual training records should contain the following as a minimum and as applicable:

- Education, experience, employment history, and most recent health evaluation.

- Completed training program(s) and certification(s).
- Correspondence and other documentation related to any training program waivers granted including justification and approvals.
- Records of any special or one-time certifications for special tests or operations.
- Attendance records for training courses or sessions as well as for continuing training.
- Latest completed certification records, graded written examinations with answers and keys, and any operational evaluations used for certification.
- Any additional material the facility deems appropriate for inclusion in individual training records.

b. The facility should establish time limits on maintaining the hard copy of training records on file prior to placing them in long term storage, on microfiche, etc.

c. All superseded information should be removed from the individual training records and held on file per the facility procedures.

d. Complete records of all training presented at the facility should be maintained including lesson plans, training aids, examinations, etc. These records should be cross-referenced to allow determination of which personnel received which training, which examination, and so on.

e. A tracking system should be developed to alert facility training personnel when a facility procedure is changed/modified that may impact training. If resources permit, this system could be included as a direct cross-reference from each facility procedure to the applicable lesson plan that supports it.

f. A master listing should be maintained of facility certified personnel and the positions for which they are certified. This will allow facility supervision to track the certification status of personnel performing safety-related, or equivalent, tasks.

2.3.20 Scheduling of Training

Due to the limited training resources in both time and personnel, the facility should make an effort to determine the expected long-term training needs for its personnel. This will allow much more cost-effective use of the available resources and will build in the flexibility to focus facility operations to support the training effort.

A long range (at least two years) training plan should be developed with the best estimation of the personnel training needs, the types of training needs, and the training resources needed to meet these needs. Proper development of this schedule requires participation of the LLW

Disposal Facility Manager, all Facility Supervision personnel and the Facility Training Supervisor. Each should determine the needs of their specific areas, for example, major facility inspections, expected radwaste shipments, expected hiring or layoff plans, and related information.

This schedule should be made as firm as possible yet still allow some modifications, insertions, or deletions of training as conditions warrant. Once the schedule is established and approved, the training staff can begin to look at the development work required, start requisitions for any scheduled vendor training, schedule training classrooms, develop examination and training aids, etc. The more advanced planning and work accomplished, the better quality product the training staff can deliver with a resultant increase in trainee knowledge and skills levels, and a more efficiently run facility.

2.3.21 Training Program Forms

As with the training matrix discussed in Section 2.3.16 of this document, the facility will need to use some standardized formats for the various forms and records used in the development and implementation of its training programs. The following samples are given for the facility to use, modify, or discard as they see fit.

a. **Facility Lesson Outline Format**. See Attachment 3 of this document for a sample of the Health Physics Technician (HPT) training program lesson outline form for the three phases of this program. This form is used as part of the model curriculum for each training program and is a basic listing of objectives given as lesson topics for each of the projected lesson plans to be developed. The facility is expected to develop its lesson plans from these outlines.

b. **Job Performance Measure (JPM) Format**. See Attachment 2 of this document. This form is set up with the option for questions at the end of the JPM and can be easily modified for specific facility use.

2.3.22 Job Performance Measures

The JPM is one of the more useful portions of a training program. It can be used as a tool for training an individual by providing step-by-step instruction for a specific task. Once the task has been mastered, the same method can be used for formalized evaluation of the trainee's ability to perform the task.

Though a sample JPM format is included in Attachment 2 of this document, a JPM can be as simple as a facility procedure with a JPM cover sheet attached. The initial task conditions and the initiating cue for the evaluator can be read to the trainee. This allows training on each specific facility procedure in a walk-through format. With this in mind, initial facility JPM development may be just a generic JPM that directs the performance (or simulation) of a procedure step-by-step as a training evolution. This provides the trainee the opportunity to see and use each facility procedure and can give some immediate feedback on the procedures.

2.3.23 Training Program Future Considerations

In an ideal situation, the first major step to be taken after the initial development and implementation of a training program is to begin looking at how it can be made better and more efficient. Given the limited facility resources for training, the facility should look at the efficiency aspects as soon as possible. The following are some ideas for consideration.

2.3.23.1 Computer-Based Training (CBT). The use of computer-based training is increasingly widespread. CBT provides consistent training throughout all presentations without having to take into consideration the differences between instructors. This is important when a specific lesson may only be presented once or twice a year.

A large majority of the applicable training for the LLW disposal facility is currently available via CBT especially in the areas of radiological worker training, safety, first aid, academic topics, etc. The facility-specific material can also easily be adapted to this media.

2.3.23.2 Video Taped Training. A related alternative to CBT is the use of video tape. A facility that tapes lectures, OJT sessions, actual facility operations, etc., has a reliable source of information for providing support to the training program. If allowable, unique vendor training should be videotaped. Again, this will provide another route to training program consistency; all trainees receive the same information.

2.3.23.3 Prepackaged Training. Prepackaged training document is a viable method of obtaining good, consistent training input for the training programs. There is little reason for spending the limited facility training funds attempting to develop a training program for radiological workers from scratch when literally hundreds of other facilities already have them in place and have refined them to a point of near perfection.

2.3.24 Summary

Though this entire training curriculum has been developed with the intention of meeting the requirements of several LLW disposal facilities in different states, subject to different regulations, it is just not possible to write one set of guidelines that will cover all possible requirements. Instead, this document needs to be the foundation for a facility-specific set of training programs that have been refined to meet that facility's needs. If the facility and the parent company maintain a strong commitment to develop and implement solid training programs and use this model as their keystone, the result will be highly trained, safe, competent employees and long-term, efficient operation of their facility.

If you have suggestions for revisions or corrections to this model please mail them to the:

National Low-Level Waste Management Program
Idaho National Engineering Laboratory
P.O. Box 1625
Idaho Falls, ID 83415-2420

Attachment 1

NUREG-1199, "Standard Format and Content of a License Application for a Low-Level Radioactive Waste Disposal Facility," Section 8.3, Training Program

8.3 Training Program

Scheduling and Training

The applicant should describe the training and retraining programs for the facility staff and the scheduling of these programs. The program descriptions should include the following:

(1) the proposed subject matter of each course, the duration of the course (approximate number of weeks in terms of full-time attendance), the organization teaching the course or supervising instruction, and the position titles of the persons who will be taking the course

(2) a commitment to conduct an onsite formal training program and OJT so that the entire facility staff will be qualified before the initial receipt of radioactive waste.

(3) plans for conducting a position task analysis for all operating personnel, in which the tasks performed by the person in each position are defined and the training, in conjunction with education and experience, is identified to provide assurance that the tasks can be effectively performed.

(4) procedures for the orientation of incidental site visitors with regard to site safety and radiation protection.

(5) the proposed means for evaluating the effectiveness of the training program for all employees.

(6) any difference in the training programs for individuals on the basis of experience, which should be categorized as follows:

    (a) No previous experience

    (b) Experience at facilities not subject to licensing

    (c) Experience at comparable facilities

The applicant should submit a chart showing the schedule for each part of the training program for each position or organizational unit identified in the SAR. The time scale should be relative to expected operation.

The applicant should show clearly to what extent the training program has been accomplished at the approximate time of the submittal of the application. Contingency plans for additional training should be described in the event operation is significantly delayed from the date indicated in the application.

The applicant should describe the plans for the retraining of facility personnel, identify the additional position categories on the facility staff for which retraining will be provided, and describe the nature, scope, and frequency of such retraining.

Attachment 2

Job Performance Measure Sample Format

JPM Cover Sheet

JPM: ____

TITLE/NUMBER: _____

COMPLETION TIME: _____

JPM AUTHOR: _____

CANDIDATE: _____

EVALUATOR: _____ **DATE:** _____

JPM (SAT/UNSAT) ____ **QUESTIONS (SAT/UNSAT) #1** ____

#2 ____

ACTUAL COMPLETION TIME: _____

COMMENTS:

JPM Information Sheet

TASK STANDARDS (Critical Steps):

REQUIRED EQUIPMENT/MATERIALS:

PROCEDURES/REFERENCES:

INITIAL CONDITIONS:

INITIATING CUE:

JPM Briefing Sheet

JPM—<u>READ TO THE TRAINEE</u>:

I will explain the initial conditions, which step(s) to simulate or discuss, and provide all required cues. When verifying a parameter or performing a switch or valve manipulation, state exactly what it is you are looking at or performing, how you will do it, and what you expect to see. When you complete the task successfully, notify the evaluator that you have finished. You may use any approved facility procedure or reference, including logs, except for those evolutions that would be required to be performed from memory, i.e., immediate actions. Make all required written reports, oral reports, and log entries as if the evolution is actually being performed. All facility valve or switch manipulations will be simulated unless otherwise directed.

JPM:

JPM PERFORMANCE INFORMATION

The sequence of steps is assumed unless denoted in the comments section of this JPM.

PERFORMANCE STEPS

___ 1.

STANDARD:

CUE:

COMMENTS:

SAT _____ UNSAT _____

___ 2.

STANDARD:

CUE:

COMMENTS:

SAT _____ UNSAT _____

JPM:

___ 3.

STANDARD:

CUE:

COMMENTS:

SAT _____ UNSAT _____

___ 4.

STANDARD:

CUE:

COMMENTS:

SAT _____ UNSAT _____

___ 5.

STANDARD:

CUE:

COMMENTS:

SAT _____ UNSAT _____

Appendix A

Operations Specialist Training Program

CONTENTS

A-1. Facility Operations Specialist Training Program A-5

A-1.1 Applicability A-5

A-1.2 Program Entry Requirements A-5

A-1.2.1 Level of Education A-5
A-1.2.2 Experience A-5
A-1.2.3 Physical Attributes A-6

A-1.3 Training Waiver Policy A-6

A-1.3.1 No Previous Experience A-6
A-1.3.2 Experience at Facilities Not Subject to Licensing A-7
A-1.3.3 Experience at Comparable Facilities Subject to Licensing A-7

A-1.4 Position Certification Requirements A-7

A-1.5 Work Without Certification Policy A-8

A-1.6 Records Maintenance A-8

A-1.7 Training Matrix A-9

A-1.8 Continuing Training Program A-9

A-1.9 Training Records A-10

A-1.10 References A-10

Attachment 1 Operations Specialist Training Matrix A-11

Attachment 2 Operations Specialist Certification Record A-19

Attachment 3 Operations Specialist Lesson Outlines A-31

Appendix A

A-1. Facility Operations Specialist Training Program

A-1.1 Applicability

The training program described in this appendix is applicable to the training of Operations Specialists at low-level radioactive waste (LLW) disposal facilities. The individuals successfully participating in and completing this program will be certified as Operations Specialists and will be responsible for, but not limited to, loading, unloading, and movement of LLW; operating the facility electrical, gas, HVAC, water, and other supporting systems; responding to alarms and emergency situations; and additional duties as applicable.

Facilities wishing to employ persons (after the initial receipt of radioactive waste) who are not fully certified as Operations Specialists can designate a position of Apprentice Operations Specialist. This individual may, while in training to certify, perform some tasks of the Operations Specialist subject to the conditions of Section A-1.5 of this appendix if they have met the requirements for General Employee and Radiological Worker Training as described in Appendix D of this curriculum.

Also facilities may wish to have a position equivalent to Senior Operations Specialist who, while not certified to be a supervisor, could make decisions on technical matters relating to the facility's Operations Department work tasks. This person will have held and maintained certification as a Operations Specialist for at least one year. This position may be considered equivalent of an apprentice position for Operations Department Supervisor.

A-1.2 Program Entry Requirements

The requirements for entry into the Operations Specialist Training Program will be determined by the Facility Manager, the Operations Department Supervisor, and the Facility Training Supervisor. Factors that should be used for determining eligibility for this program include:

A-1.2.1 Level of Education. A high school diploma (or GED equivalent) is required.

A-1.2.2 Experience. The following experience level category options are available and may be used:

- None, if hired as an Apprentice Operations Specialist
- Fully certified Operations Specialist at another LLW or commercial nuclear facility (see Section A-1.3)

- Nuclear-trained operator in the Navy Nuclear Power Program or an Operations Specialist at a U.S. Government run nuclear facility (see Section A-1.3)

- Two-year associates degree in engineering or equivalent from an accredited technical school or junior college

- Bachelor of science degree in engineering or equivalent from an accredited university.

A-1.2.3 **Physical Attributes**. Each potential program trainee must meet the following requirements:

- Meets prerequisite conditions of general health as set forth by the facility

- Meets prerequisite conditions for exposure to low levels of radiation

- Has corrected or nonimpaired visual and auditory acuity

- Meets prerequisite criteria for the wearing of respiratory equipment

- Has the manual dexterity needed to use applicable radwaste handling equipment and facility operations support equipment

- Meets facility fitness-for-duty criteria

- Has the physical strength/stamina necessary to perform applicable tasks required of an Operations Specialist.

A-1.3 Training Waiver Policy

Various combinations of the requirements for completion of the initial certification process may be waived on a case-by-case basis. Actual waiver determinations will be made by the Operations Department Supervisor and the Facility Training Supervisor and will be based on the trainee's previous experience levels. The conditions for waiver fall into three categories as described in NUREG-1199.

A-1.3.1 **No Previous Experience**. This category includes any facility designated Apprentice Operations Specialists, persons with a two-year associates degree in engineering or equivalent, and persons with a bachelor of science degree in engineering or equivalent. These three situations are handled as follows:

1. Apprentice Operations Specialists must comply with all four requirements of Section A-1.4 of this appendix with no waivers allowed.

2. Trainees with a two-year associates degree in engineering or equivalent are not required to complete Requirement 1 of Section A-1.4 of this appendix upon presentation of the accredited institution's certified copy of the candidates' official transcript showing the awarding of the degree. These trainees must complete Requirements 2, 3, and 4.

3. Trainees with a bachelor of science degree in engineering or equivalent are not required to complete Requirements 1 and 4 of Section A-1.4 of this appendix upon presentation of the accredited institution's certified copy of the candidates' official transcript showing the awarding of the degree. These trainees must complete training on Requirements 2 and 3.

A-1.3.2 Experience at Facilities Not Subject to Licensing. This category includes nuclear trained operators from the Navy Nuclear Power Program or Operations Specialists from U.S. Government facilities. These trainees are not required to complete Requirements 1 and 4 of Section A-1.4 of this appendix upon presentation of documentation from the U.S. Navy as a nuclear trained operator or from the Department of Energy of certification as an Operations Specialist. These trainees must complete training on Requirements 2 and 3.

A-1.3.3 Experience at Comparable Facilities Subject to Licensing. This category includes Operations Specialists from other LLW facilities (subject to 10 CFR 20 and 10 CFR 61 licensing) and Operations Department personnel from commercial nuclear facilities (subject to 10 CFR 20 and 10 CFR 50 licensing). These trainees are not required to complete Requirements 1, 2, and 4 of Section A-1.4 of this appendix upon presentation of documentation from a licensed LLW facility of certification as an Operations Specialist or from the licensed commercial nuclear facility of certification as Operations Department personnel. These trainees must complete training on Requirement 3.

A-1.4 Position Certification Requirements

The initial certification process consists of four specific and different sections of training and on-the-job experience. The requirements for the specific sections to be completed by each trainee are addressed in Section A-1.3 of this appendix. The four sections are:

1. Phase A. Successful completion of classroom academic training and evaluation (Course OS-100)

2. Phase B. Successful completion of required core practical training and evaluation (Course OS-200)

3. Phase C. Successful completion of required facility-specific practical training and evaluation (Course OS-300)

4. Compliance with the onsite experience requirement of the facility.

Certification of a trainee to an Operations Specialist position will be made only after ensuring all the requirements of training attendance, training evaluations, physical condition, and job work performance and experience, etc., have been satisfied. When the trainee completes position certification, the LLW Facility Manager is assured the individual is capable of performing all aspects of the tasks for which certification was given. Position certification will be valid indefinitely (unless revoked for cause) and will be reinforced by participation in the continuing training program.

Approval of a trainee's position certification will be the responsibility of the Operations Department Supervisor. The Operations Department Supervisor assumes supervisory control of the department subsequent to certification as both an Operations Specialist and a Facility Supervisor.

A-1.5 Work Without Certification Policy

Persons initially not certified to perform the duties of the Operations Specialist would be allowed to perform individual Operations Department tasks under the following specific conditions:

a. the person is in training to certify as an Operations Specialist (this would usually be an Apprentice Operations Specialist) **AND**

b. the trainee has successfully completed and been signed off on the Job Performance Measure (JPM) for the task to be performed **OR**

c. a certified Operations Specialist is present to direct and monitor the trainee's performance of the task.

This assumes that the individual has met the requirements for General Employee and Radiological Worker Training as described in Appendix D of this curriculum.

A-1.6 Records Maintenance

All training program records of course attendance, course schedules, position certification, lesson plans and outlines, JPMs, on-the-job training, etc., will be maintained in accordance with the LLW disposal facility administrative requirements as described in the facility license.

A master listing of certified Operations Specialists will be maintained. This listing will be in a format such that facility supervision is aware of the certification status of all personnel performing Operations Department tasks. Specifically, the listing should include the following:

a. A list of all facility personnel designated as Senior Operations Specialists.

- This will include documentation of the individual's certification as an Operations Specialist for one year(s) to meet requirements for Senior Operations Specialist.

b. A list of all facility personnel certified as an Operations Specialist.

- This will include the overall completion date of the certification as well as the satisfactory participation in the facility Continuing Training Program.

c. A list of all facility personnel designated as Apprentice Operations Specialists.

- This will include the specific tasks for which they have been trained and associated JPMs that have been signed off. This list determines the tasks they will be allowed to perform without completion of certification per Sections A-1.1 and A-1.5 of this appendix.

A-1.7 Training Matrix

A training matrix (see Attachment 1 of this appendix) will be developed and maintained relating training program information in the format as shown in Section 2.3.15 of this training curriculum. This matrix will outline the specific tasks required to certify as an Operations Specialist and will describe the training and evaluation methods needed to provide the trainee the knowledge and skills necessary for certification.

A-1.8 Continuing Training Program

Fully certified Operations Specialists will participate in the facility Continuing Training Program. This program will be an ongoing series of specific training topics to be presented using the classroom, self-study, and JPM formats. The topics to be covered during each training period (annually) will be determined by the Operations Department Supervisor and the Facility Training Supervisor. They should cover selected portions of the initial certification requirements per Sections A-1.4, items 1, 2, and 3 of this appendix as well as lessons learned from facility operations and industry-related events. The topics for each training period should be chosen such that over a specified period (biennially) facility Operations Specialists would be retrained in all areas of their initial certification requirements.

Documentation of individual participation and completion of these requirements will be maintained and subject to the record keeping requirements set forth in Section A-1.6 of this appendix.

A-1.9 Training Records

The outlines of the courses, lessons, JPMs, and other material that compose the Operations Specialist Training Program will be maintained and subject to the record keeping requirements as set forth in Section A-1.6 of this appendix. This training material should follow the formats of the following attachments in Section 2 of this training curriculum:

a. Section 2, Attachment 2—Job Performance Measure

a. Section 2, Attachment 3—Lesson Outline

A-1.10 References

1. Code of Federal Regulations, Title 10, Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

2. U.S. Nuclear Regulatory Commission, *Standard Format and Content of a License Application for a Low-Level Radioactive Waste Disposal Facility*, NUREG-1199.

Appendix A

Attachment 1

Operations Specialist
Training Matrix

Attachment 1. Operations Specialist Training Matrix

Table 1-1. Academic Training.[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Perform simple mathematical calculations	TR	CR	WE	OS-101/102	TRNG
Solve simple problems of physical science	TR	CR	WE	OS-103	TRNG
Explain the basic concepts associated with electricity	TR	CR	WE	OS-104	TRNG
Describe the structure of the atom	TR	CR	WE	OS-105	TRNG
Explain the basic concepts associated with radiation detection and protection	TR	CR	WE	OS-106	TRNG
Explain the basic concepts associated with chemistry	TR	CR	WE	OS-107	TRNG

a.

TR	-	Train	WE	-	Written Exam	CR	-	Classroom	OT	-	Over-Train
NT	-	No-Train	CONT	-	Contract Vendor	SS	-	Self-Study	DEPT	-	Trainee's Department
PT	-	Pre-Train	TRNG	-	Training Department	OJT	-	On-the-Job Training	JPM	-	Job Performance Measure
OS	-	Operations Specialist									

Attachment 1. Operations Specialist Training Matrix

Table 1-2. Core Practical Training.[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Discuss how to read and use a Radiological (Radiation) Work Permit	TR	CR/SS	WE	OS-201	TRNG
Explain the requirements for Health Physics Technician coverage for various jobs	TR	CR	WE	OS-202	TRNG
Explain the radiologically controlled area posting signs and their requirements	TR	CR/SS	WE	OS-203	TRNG
Respond to a high airborne activity alarm	TR	CR	WE	OS-204	TRNG
Respond to an area high radiation alarm	TR	CR	WE	OS-205	TRNG
Respond to an uncontrolled release of radioactive material	TR	CR	WE	OS-206	TRNG
Don and remove protective respiratory equipment	TR	CR/OJT	JPM	OS-207	TRNG
Don and remove protective clothing	TR	CR/OJT	JPM	OS-208	TRNG
Respond to an injured person in a radiologically controlled area	TR	CR/OJT	JPM	OS-209	TRNG
Explain the basic concepts and components associated with pumps	TR	CR	WE	OS-210	TRNG
Explain the basic concepts and components associated with valves	TR	CR	WE	OS-211	TRNG
Explain the basic concepts and components associated with valve operators	TR	CR	WE	OS-212	TRNG
Explain the basic concepts and components associated with strainers and filters	TR	CR	WE	OS-213	TRNG
Explain the basic concepts and components associated with steam traps	TR	CR	WE	OS-214	TRNG
Explain the basic concepts and components associated with heat exchangers	TR	CR	WE	OS-215	TRNG
Explain the basic concepts and components associated with air compressors	TR	CR	WE	OS-216	TRNG
Explain the basic concepts and components associated with diesel generators	TR	CR	WE	OS-217	TRNG

a.

TR	-	Train	WE	-	Written Exam	CR	-	Classroom	OT	-	Over-Train
NT	-	No-Train	CONT	-	Contract Vendor	SS	-	Self-Study	DEPT	-	Trainee's Department
PT	-	Pre-Train	TRNG	-	Training Department	OJT	-	On-the-Job Training	JPM	-	Job Performance Measure

Attachment 1. Operations Specialist Training Matrix

Table 1-2. (continued).[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Explain the basic concepts and components associated with electrical distribution	TR	CR	WE	OS-218	TRNG
Explain the basic concepts and components associated with instrumentation and control	TR	CR	WE	OS-219	TRNG
Explain the basic concepts and components associated with air conditioning, heating, and ventilation	TR	CR	WE	OS-220	TRNG
Explain the basic concepts and components associated with refrigeration machines	TR	CR	WE	OS-221	TRNG
Explain the basic concepts and components associated with test equipment	TR	CR	WE	OS-222	TRNG
Explain the basic concepts and components associated with rigging and lifting equipment	TR	CR/OJT	WE/JPM	OS-223	DEPT
Explain the basic concepts and components associated with forklifts and similar lifting/transport equipment	TR	CR/OJT	WE/JPM	OS-224	DEPT
Explain the basic concepts and components associated with compressed gas systems	TR	CR	WE	OS-225	TRNG
Explain the basic concepts and components associated with fire suppression	TR	CR	WE	OS-226	TRNG
Explain the basic concepts and components associated with radiation monitoring	TR	CR	WE	OS-227	TRNG
Explain the basic concepts and components associated with domestic water system	TR	CR	WE	OS-228	TRNG
Explain the basic concepts and components associated with communications systems	TR	CR/OJT	WE	OS-229	TRNG

a.

TR	-	Train	WE	-	Written Exam	CR	-	Classroom	OT	-	Over-Train
NT	-	No-Train	CONT	-	Contract Vendor	SS	-	Self-Study	DEPT	-	Trainee's Department
PT	-	Pre-Train	TRNG	-	Training Department	OJT	-	On-the-Job Training	JPM	-	Job Performance Measure

Attachment 1. Operations Specialist Training Matrix

Table 1-3. Facility-Specific Practical Training.[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Use facility and federal radiological protection standards	TR	CR/OJT	WE/JPM	OS-301	TRNG
Explain ALARA and the methods used for implementation	TR	CR	WE	OS-302	TRNG
Explain how the Operations Department documents its work	TR	CR/SS	WE	OS-303	DEPT
Use onsite and offsite communications systems	TR	CR/SS	WE/JPM	OS-304	TRNG
Demonstrate the ability to use all rigging and lifting equipment	TR	CR/OJT	JPM	OS-305	DEPT
Demonstrate the ability to use forklifts and similar lifting/transport equipment	TR	CR/OJT	JPM	OS-306	DEPT
Demonstrate the ability to operate facility air compressors	TR	CR/OJT	JPM	OS-307	DEPT
Demonstrate the ability to operate facility diesel generators	TR	CR/OJT	JPM	OS-308	DEPT
Demonstrate the ability to operate facility electrical distribution system	TR	CR/OJT	JPM	OS-309	DEPT
Demonstrate the ability to operate facility instrumentation and control systems	TR	CR/OJT	JPM	OS-310	DEPT
Demonstrate the ability to operate facility heating, ventilating and air conditioning (HVAC) systems	TR	CR/OJT	JPM	OS-311	DEPT
Demonstrate the ability to operate facility refrigeration equipment	TR	CR/OJT	JPM	OS-312	DEPT
Demonstrate the ability to operate facility compressed gas systems	TR	CR/OJT	JPM	OS-313	DEPT
Discuss the types of LLW radioactive waste stored at this facility	TR	CR/SS	WE	OS-314	TRNG
Describe the specific waste storage areas at this facility	TR	CR/SS	WE	OS-315	TRNG
Describe the specific equipment used for handling waste at this facility	TR	CR/OJT	WE/JPM	OS-316	DEPT

a.

TR	-	Train	WE	-	Written Exam	CR	-	Classroom	OT	-	Over-Train
NT	-	No-Train	CONT	-	Contract Vendor	SS	-	Self-Study	DEPT	-	Trainee's Department
PT	-	Pre-Train	TRNG	-	Training Department	OJT	-	On-the-Job Training	JPM	-	Job Performance Measure
ALARA	-	as low as reasonably achievable									

Attachment 1. Operations Specialist Training Matrix

Table 1-3. (continued).[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Demonstrate the ability to operate and monitor facility radiation monitoring system	TR	CR/OJT	JPM	OS-317	DEPT
Demonstrate the ability to perform all actions associated with receiving radioactive waste	OT	CR/OJT	WE/JPM	OS-318	DEPT
Demonstrate the ability to perform all actions associated with shipping radioactive waste	OT	CR/OJT	WE/JPM	OS-319	DEPT
Demonstrate the ability to perform all actions associated with movement of radioactive waste within the facility	TR	CR/OJT	WE/JPM	OS-320	DEPT
Demonstrate the ability to perform all facility building and grounds maintenance	NT			OS-321	
Demonstrate the ability to operate the facility domestic water system	TR	CR/OJT	JPM	OS-322	DEPT
Perform emergency response team (fire brigade) responsibilities	OT	CR/OJT	WE/JPM	OS-323	TRNG
Perform emergency/abnormal actions required for storage container failure	OT	CR/OJT	WE/JPM	OS-324	DEPT
Perform emergency/abnormal actions required for storage container handling equipment failure	OT	CR/OJT	WE/JPM	OS-325	DEPT
Perform emergency/abnormal actions required for civil disturbance or act of violence	OT	CR/OJT	WE/JPM	OS-326	TRNG
Perform emergency/abnormal actions required for facility evacuation emergency	OT	CR/OJT	WE/JPM	OS-327	TRNG
Perform emergency/abnormal actions required for facility take cover emergency	OT	CR/OJT	WE/JPM	OS-328	TRNG
Perform emergency/abnormal actions required for a fire on facility property	OT	CR/OJT	WE/JPM	OS-329	TRNG
Perform emergency/abnormal actions required for a fire off facility property	OT	CR/OJT	WE/JPM	OS-330	TRNG
Perform emergency/abnormal actions required for loss/impairment of any emergency response equipment	OT	CR/OJT	WE/JPM	OS-331	TRNG

a. TR - Train; NT - No-Train; PT - Pre-Train; ALARA - as low as reasonable achievable; WE - Written Exam; CONT - Contract Vendor; TRNG - Training Department; CR - Classroom; SS - Self-Study; OJT - On-the-Job Training; OT - Over-Train; DEPT - Trainee's Department; JPM - Job Performance Measure

Attachment 1. Operations Specialist Training Matrix

Table 1-3. (continued).[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Perform emergency/abnormal actions required for loss/impairment of evacuation/take cover system	OT	CR/OJT	WE/JPM	OS-332	TRNG
Perform emergency/abnormal actions required for loss/impairment of facility onsite and/or offsite communications systems	OT	CR/OJT	WE/JPM	OS-333	TRNG
Perform emergency/abnormal actions required for loss/impairment of facility domestic water system	OT	CR/OJT	WE/JPM	OS-334	TRNG
Perform emergency/abnormal actions required for loss/impairment of facility electrical distribution system	OT	CR/OJT	WE/JPM	OS-335	TRNG
Perform emergency/abnormal actions required for loss/impairment of facility fire detection, alarm and suppression systems	OT	CR/OJT	WE/JPM	OS-336	TRNG
Perform emergency/abnormal actions required for loss/impairment of facility HVAC systems	OT	CR/OJT	WE/JPM	OS-337	TRNG
Perform emergency/abnormal actions required for radiological casualties	OT	CR/OJT	WE/JPM	OS-338	TRNG
Perform emergency/abnormal actions required for loss/impairment of facility radiation monitoring systems	OT	CR/OJT	WE/JPM	OS-339	TRNG
Perform onsite and offsite notifications as required during an emergency/abnormal situation	OT	CR/OJT	WE/JPM	OS-340	TRNG
Demonstrate the ability to locate all facility areas and equipment as well as emergency equipment	TR	CR/OJT	WE/JPM	OS-341	TRNG
Discuss all applicable facility safety regulations specific to an Operations Specialist	TR	CR/SS	WE	OS-342	DEPT
Perform emergency/abnormal actions required for vehicle accident	OT	CR/OJT	WE/JPM	OS-343	TRNG
Perform emergency/abnormal actions required for heavy equipment accident	OT	CR/OJT	WE/JPM	OS-344	TRNG

a.

TR	-	Train	WE	-	Written Exam	CR	-	Classroom	OT	-	Over-Train
NT	-	No-Train	CONT	-	Contract Vendor	SS	-	Self-Study	DEPT	-	Trainee's Department
PT	-	Pre-Train	TRNG	-	Training Department	OJT	-	On-the-Job Training	JPM	-	Job Performance Measure
ALARA	-	as low as reasonable achievable									

Appendix A

Attachment 2

Operations Specialist Certification Record

Attachment 2

Operations Specialist Certification Record

The Operations Specialist Certification Record documents the satisfactory completion of the knowledge and ability requirements of the Operations Specialist Training Program. The Certification Record is divided into the following phases:

Phase A: Operations Specialist Academics Training (Course OS-100)

- There are eight generic lessons suggested for inclusion in the academics portion of the training. The facility staff member (supervisor, classroom instructor, or designee) should sign the appropriate blocks upon the trainee's attendance and completion of each lesson. This will include any individual lesson evaluation by written examination or the satisfactory completion of a job performance measure (JPM). The facility instructor assigned the responsibility for Operations Department training signs the trainee's successful completion of the Operations Specialist (OS) Academics Training final comprehensive examination with a score of 70% or better.

- In addition to the listed academic lessons, the facility may need additional lessons to meet specific knowledge requirements from the JPMs in the practical training phases (B and C).

Phase B: Operations Specialist Core Practical Training (Course OS-200)

- There are 29 generic tasks suggested for inclusion in the core practical training course. The trainer or evaluator should sign the appropriate block upon completion of the training and evaluation of the trainee's ability to satisfactorily perform each task. Fully certified Operations Specialists and OS Training Instructors may sign as Trainer/Evaluator.

- The matrix of generic tasks may be updated with task additions or deletions based on the results of periodic facility Job-Task evaluations.

Phase C: Operations Specialist Facility-Specific Practical Training (Course OS-300)

- There are 45 specific tasks suggested for inclusion in the facility-specific practical training course. The trainer or evaluator should sign the appropriate block upon completion of the training and evaluation of the trainee's ability to satisfactorily perform each task. Fully certified Operations Specialists and OS Training Instructors may sign as Trainer/Evaluator.

- The matrix of facility-specific tasks may be updated with task additions or deletions based on the results of periodic facility Job-Task evaluations.

Upon completion of all certification requirements for Operations Specialists, final certification is verified by signatures of the trainee and the Facility Training Supervisor. Facility supervisory recommendation of the trainee for this position and verification that experience requirements are met is by the signature of the Operations Department Supervisor. Approval of the trainee's successful completion of all requirements of the Operations Specialist Training Program is acknowledged by signature of the LLW Facility Manager. The completed Certification Record is maintained by the Facility Training Supervisor as an official training record and is subject to the record keeping requirements set forth in Section A-1.6 of this appendix as well as those of the parent company quality assurance and human resources programs.

Phase A—Operations Specialist Training Program Academics Training Certification Record (OS-100).[a]

Academic Training Lesson Course OS-100	Evaluation grade	Trainer/evaluator signature	Date
OS-101 Basic mathematics and algebra			
OS-102 Unit analysis and conversion			
OS-103 Physical science fundamentals			
OS-104 Electrical fundamentals			
OS-105 Nuclear physics fundamentals			
OS-106 Radiation detection and protection fundamentals			
OS-107 Chemistry fundamentals			
OS-100 Academics Comprehensive Final Examination			

a. The items listed in the Academic Training Lesson column are intended as a guide for the development of a facility-specific program and can be modified.

Notes: OS = Operations Specialist

Phase B—Operations Specialist Training Program Core Practical Training Certification Record (OS-200).[a]

Core Practical Training Course OS-200	Evaluation grade	Trainer/evaluator signature	Date
OS-201 Radiological (Radiation) Work Permits			
OS-202 Requirements for Health Physics Technician coverage for work			
OS-203 Radiologically controlled area posting requirements			
OS-204 High airborne activity alarm actions			
OS-205 Area high radiation alarm actions			
OS-206 Uncontrolled release of radioactive material actions			
OS-207 Use of protective respiratory equipment			
OS-208 Use of protective clothing			
OS-209 Injured person in a radiologically controlled area actions			
OS-210 Basic concepts and components of pumps			
OS-211 Basic concepts and components of valves			
OS-212 Basic concepts and components of valve operators			
OS-213 Basic concepts and components of strainers and filters			
OS-214 Basic concepts and components of steam traps			
OS-215 Basic concepts and components of heat exchangers			
OS-216 Basic concepts and components of air compressors			
OS-217 Basic concepts and components of diesel generators			
OS-218 Basic concepts and components of electrical distribution			
OS-219 Basic concepts and components of instrumentation and control			
OS-220 Basic concepts and components of heating, ventilating, and air conditioning			

a. The items listed in the Core Practical Training column are intended as a guide for the development of a facility-specific program and can be modified.

Phase B—Operations Specialist Training Program Core Practical Training Certification Record (continued).[a]

Core Practical Training Course OS-200	Evaluation grade	Trainer/evaluator signature	Date
OS-221 Basic concepts and components of refrigeration			
OS-222 Basic concepts and components of test equipment			
OS-223 Basic concepts and components of rigging and lifting equipment			
OS-224 Basic concepts and components of forklifts and similar lifting/transport equipment			
OS-225 Basic concepts and components of compressed gas systems			
OS-226 Basic concepts and components of fire suppression systems			
OS-227 Basic concepts and components of radiation monitoring systems			
OS-228 Basic concepts and components of domestic water system			
OS-229 Basic concepts and components of communications systems			

a. The items listed in the Core Practical Training column are intended as a guide for the development of a facility-specific program and can be modified.

Phase C—Operations Specialist Training Program Facility-Specific Practical Training Certification Record (OS-300).[a]

Facility-Specific Practical Training Course OS-300	Evaluation grade	Trainer/evaluator signature	Date
OS-301 Use facility/federal radiological protection standards			
OS-302 Explain ALARA and the methods used for implementation			
OS-303 Explain how the Operations Department documents work			
OS-304 Use onsite and offsite communications			
OS-305 Operate all rigging and lifting equipment			
OS-306 Operate forklifts and similar lifting/transport equipment			
OS-307 Operate air compressors			
OS-308 Operate diesel generators			
OS-309 Operate the electrical distribution system			
OS-310 Operator the instrumentation and control systems			
OS-311 Operate the heating, ventilating, and air conditioning systems			
OS-312 Operate the refrigeration equipment			
OS-313 Operate the compressed gas systems			
OS-314 Discuss the low-level radioactive waste at the facility			
OS-315 Describe the specific waste storage areas at the facility			
OS-316 Describe the waste handling equipment used at the facility			
OS-317 Operate and monitor the radiation monitoring systems			
OS-318 Perform actions for receiving radioactive waste			
OS-319 Perform actions for shipping radioactive waste			

a. The items listed in the Facility-Specific Practical Training column are intended as a guide for the development of a facility-specific program and can be modified.

Note: ALARA - as low as reasonable achievable.

Phase C—Operations Specialist Training Program Facility-Specific Practical Training Certification Record (continued).[a]

Facility-Specific Practical Training Course OS-300	Evaluation grade	Trainer/evaluator signature	Date
OS-320 Perform actions for moving waste within the facility			
OS-321 Perform all buildings and grounds maintenance			
OS-322 Operate the domestic water system			
OS-323 Perform emergency response team (fire brigade) responsibilities			
OS-324 Perform actions for waste storage container failure			
OS-325 Perform actions for waste storage container handling equipment failure			
OS-326 Perform actions for civil disturbance/act of violence			
OS-327 Perform actions for facility evacuation emergency			
OS-328 Perform actions for facility take cover emergency			
OS-329 Perform actions for fire on facility property			
OS-330 Perform actions for fire off facility property			
OS-331 Perform actions for loss/impairment of emergency response equipment			
OS-332 Perform actions for loss/impairment of evacuation/take cover system			
OS-333 Perform actions for loss/impairment of onsite and/or offsite communications systems			
OS-334 Perform actions for loss/impairment of domestic water system			
OS-335 Perform actions for loss/impairment of electrical distribution system			
OS-336 Perform actions for loss/impairment of fire detection, alarm and suppression systems			

a. The items listed in the Facility-Specific Practical Training column are intended as a guide for the development of a facility-specific program and can be modified.

Note: ALARA - as low as reasonably achievable.

Phase C—Operations Specialist Training Program Facility-Specific Practical Training Certification Record (continued).[a]

Facility-Specific Practical Training Course OS-300	Evaluation grade	Trainer/evaluator signature	Date
OS-337 Perform actions for loss/impairment of heating, ventilating, and air conditioning systems			
OS-338 Perform actions for radiological casualties			
OS-339 Perform actions for loss/impairment of radiation monitoring systems			
OS-340 Perform onsite and offsite notifications during emergency or abnormal situations			
OS-341 Locate all facility areas and emergency equipment			
OS-342 Discuss all safety regulations applicable for an Operations Specialist			
OS-343 Perform actions for a vehicle accident			
OS-344 Perform actions for a heavy equipment accident			

a. The items listed in the Facility-Specific Practical Training column are intended as a guide for the development of a facility-specific program and can be modified.

Note: ALARA - as low as reasonably achievable.

Operations Specialist
Certification Signature Record

I hereby verify through the review of this Certification Record that I have completed all documented academic training, core and facility-specific practical training requirements, and request my certification as an Operations Specialist. To the best of my knowledge I have no physical or mental disabilities that preclude me from performing the tasks required of this position.

_____ _____
Operations Specialist Trainee Date

I hereby verify that all required academic training, core and facility-specific practical training for the above named trainee has been satisfactorily completed for the position of Operations Specialist. Facility training records indicate this trainee has attended all training sessions and satisfactorily passed all examinations and Job Performance Measure (JPM) evaluations as documented in this Certification Record.

_____ _____
Facility Training Supervisor or designee Date

I have reviewed this Certification Record and certify the trainee is capable of safely performing all facility required tasks of an Operations Specialist. Facility records indicate this trainee meets all the experience requirements of Section A-1.3 of this appendix. Documentation for any applicable experience outside this facility is attached.

_____ _____
Operations Department Supervisor or designee Date

I have reviewed this Certification Record and hereby certify this trainee as an Operations Specialist at this facility.

_____ _____
LLW Facility Manager or designee Date

Appendix A

Attachment 3

Operations Specialist
Lesson Outlines

NOTE: When compared to the relative risk to the public health and safety from a LLW disposal facility, the detail included in these outlines may appear to be more than necessary for many operations. The training program developer is cautioned to carefully select what is necessary to meet the facility's specific needs. In some cases, individuals responsible for training may want to instruct from these outlines. In others, it may be more appropriate to develop the outlines into self-study materials. Some facilities may also choose to provide the outlines to outside vendors or educational institutions to develop training for the facility's employees.

Facility Name Lesson Outline OS-101

Program: OS — Operations Specialist

Phase: A — Academic Training

Course: OS-100

Lesson Outline: OS-101 — Basic mathematics and algebra

Lesson Topics:

- Add and subtract assigned numbers
- Multiply and divide assigned numbers
- Convert between numbers expressed in standard form and in scientific notation
- Multiply and divide numbers with exponents without the use of a calculator
- Substitute constants into algebraic equations and solve
- Solve problems using common and/or natural logarithms
- Solve problems using fractions and decimals
- Solve problems using percentages and averages

Facility Name Lesson Outline OS-102

Program: OS — Operations Specialist

Phase: A — Academic Training

Course: OS-100

Lesson Outline: OS-102 — Unit analysis and conversion

Lesson Topics:

- State the commonly used unit systems of measurement and the base units for mass, length, and time in each system

- State the values and abbreviations for the following metric prefixes:

  - mega-
  - kilo-
  - centi-
  - milli-
  - micro-
  - nano-
  - pico-

- Given a measurement and the appropriate conversion factor(s) or conversion factor table, convert the measurement to the specified units

Facility Name Lesson Outline OS-103

Program: OS — Operations Specialist

Phase: A — Academic Training

Course: OS-100

Lesson Outline: OS-103 — Physical science fundamentals

Lesson Topics:

- Define the terms as they relate to physics:

  - Work
  - Force
  - Energy

- Identify and describe three forms of energy

- Describe each physical state in terms of shape and volume

  - Gas
  - Liquid
  - Solid

- Define and describe the applications of the following principles:

  - Conditions of equilibrium
  - Conservation of energy
  - Density, height, and temperature effects on process fluids
  - Energy
  - Fluid mechanics
  - Force
  - Heat
  - Laws of motion
  - Power
  - Temperature measuring systems
  - Temperature conversions
  - Work
  - Pressure measuring systems

Facility Name Lesson Outline OS-103 (continued)

Program: OS — Operations Specialist

Phase: A — Academic Training

Course: OS-100

Lesson Outline: OS-103 — Physical science fundamentals (continued)

Lesson Topics:

- Identify the English and metric units for the following:

  - Pressure (vacuum/pressure, differential pressure)
  - Temperature
  - Flow
  - Volume
  - Mass
  - Weight
  - Distance
  - Time

Facility Name Lesson Outline OS-104

Program: OS — Operations Specialist

Phase: A — Academic Training

Course: OS-100

Lesson Outline: OS-104 — Electrical fundamentals

Lesson Topics:

- Describe the facility electrical safety requirements
- Define and describe the basic concepts of the following:
  - Electron theory
  - Insulators
  - Conductors
  - Static electricity
  - Units of electrical measurement
  - Electrical laws
  - Basic electrical circuits
  - Direct current (DC) theory
  - DC sources
  - Alternating current (AC) theory
  - AC sources
- Describe the function, location, and operation of the facility electrical system as follows:
  - Sources of electrical power
  - Distribution
  - Switchgear components
  - Relay and fault protection circuits
- Describe the function and operation of the facility power transformers

Facility Name Lesson Outline OS-105

Program: OS — Operations Specialist

Phase: A — Academic Training

Course: OS-100

Lesson Outline: OS-105 — Nuclear physics fundamentals

Lesson Topics:

- Describe the basic structure of the atom, including subatomic particles
- Define the following terms:
  - Atomic number
  - Mass number
  - Atomic mass
  - Fission
  - Criticality
  - Isotope
  - Nuclide
- Describe the radioactive decay process
- Describe how shielding effects radiation levels for the various types of radiation
- Describe the types of fixed and portable shielding available at this facility

Facility Name Lesson Outline OS-106

Program: OS — Operations Specialist

Phase: A — Academic Training

Course: OS-100

Lesson Outline: OS-106 — Radiation detection and protection fundamentals

Lesson Topics:

- Identify the following four sources of natural background radiation including the origin, radionuclides, variables, and contribution to exposures:

  - Terrestrial
  - Cosmic
  - Internal emitters
  - Inhaled radionuclides

- Identify the following sources or artificially produced radiation and the magnitude of dose received from each:

  - Nuclear fallout
  - Medical exposures
  - Consumer products
  - Nuclear facilities

- Define radioactivity

- Identify the three major types of radioactive emissions and describe the characteristics of each

- Identify why fission products are unstable

- Define the various radioactivity units of measurement and convert between units

- List all radiation detection and measurement instruments in use at this facility and the detector type in each

- List the types of radiation each detector is designed to detect

Facility Name Lesson Outline OS-106 (continued)

Program: OS — Operations Specialist

Phase: A — Academic Training

Course: OS-100

Lesson Outline: OS-106 — Radiation detection and protection fundamentals (continued)

Lesson Topics:

- Describe the types of personnel dosimetry in use at this facility and the requirements for use of each
- Describe types of monitors, locations, and use at this facility for the following:
  - Continuous air monitors
  - Process radiation monitors
  - Area radiation monitors
- Discuss the effects of radiation on body tissue
- List and compare the federal and facility radiation controls and limits
- Discuss the requirements for use of respiratory equipment
- Discuss the requirements for use of protective clothing

Facility Name Lesson Outline OS-107

Program: OS — Operations Specialist

Phase: A — Academic Training

Course: OS-100

Lesson Outline: OS-107 — Chemistry fundamentals

Lesson Topics:

- Define and discuss the following basic chemistry terms:

  - States of matter
  - Acids and bases
  - Corrosion control
  - pH
  - Units of measure

- Discuss the following with regard to the corrosion process:

  - Types
  - Characteristics
  - Prevention

Facility Name Lesson Outline OS-201

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-201 — Radiological (Radiation) Work Permits

Lesson Topics:

- State the purpose of and the information found on a Radiological (Radiation) Work Permit (RWP)
- Discuss the Operations Specialist responsibilities in reading and using the information found on an RWP
- Discuss the specific Operations Specialist work activities that may be controlled by an RWP
- Discuss the posting requirements for RWPs
- Discuss how an Operations Specialist will know that an RWP is required for entry into a specific area
- Describe the conditions requiring a job-specific RWP

Facility Name Lesson Outline OS-202

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-202 — Requirements for Health Physics Technician coverage for work

Lesson Topics:

- Discuss the specific criteria under which an Operations Specialist tasks would require Health Physics Technician coverage
- List three purposes of job coverage
- Explain the difference between continuous and intermittent job coverage
- Explain the purpose of pre-job briefings when performing tasks requiring Health Physics Technician coverage
- Explain the Health Physics Technician responsibilities while covering an Operations Specialist job
- State the reasons to stop radiological work activities in accordance with the facility Radiological Control Manual

Facility Name Lesson Outline OS-203

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-203 — Radiologically controlled area posting requirements

Lesson Topics:

- Identify the colors and symbols used on radiological postings, signs, and labels
- Define all types of radiation, contamination, airborne radioactivity, and radioactive material areas
- State the entry, working in and exiting requirements for each area controlled for radiological purposes
- State the radiological and disciplinary consequences of disregarding radiological postings, signs, and labels
- State the radiological and disciplinary consequences of unauthorized removal or relocation of radiological postings, signs, and labels
- State the specific training requirements that must be met prior to entering a posted radiologically controlled area
- Discuss all requirements to enter a radiologically controlled area based on the postings for that area

Facility Name Lesson Outline OS-204

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-204 — High airborne activity alarm actions

Lesson Topics:

- Locate the applicable procedure/reference
- State the initial response actions for a high airborne activity alarm
- Discuss the protective clothing/respiratory protection requirements for responding to a high airborne activity alarm
- Discuss how temperature inversions/Radon buildup may affect airborne activity levels
- Discuss the airborne activity limits for this facility
- State the radiological and disciplinary consequences of disregarding high airborne activity alarms/conditions
- Identify the facility locations monitored for high airborne activity
- State the location and setpoints for the high airborne activity alarm monitors
- Discuss the most likely sources/causes of high airborne activity

Facility Name Lesson Outline OS-205

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-205 — Area high radiation alarm actions

Lesson Topics:

- Locate the applicable procedure/reference
- State the initial response actions for an area high radiation alarm
- Discuss the protective clothing/respiratory protection requirements for responding to an area high radiation alarm
- Discuss the area radiation limits for this facility
- State the radiological and disciplinary consequences of disregarding area high radiation alarms/conditions
- Identify the facility locations monitored for area high radiation
- State the location and the setpoints for the area high radiation alarm monitors
- Discuss the most likely sources/causes of area high radiation

Facility Name Lesson Outline OS-206

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-206 — Uncontrolled release of radioactive material actions (e.g., radioactive spill, stack alarm)

Lesson Topics:

- Locate the applicable procedure/reference
- State the initial response actions for an uncontrolled release of radioactive material
- List the specific precautions required when responding to a radioactive spill
- Discuss how the initial response actions differ when the spill involves dry radioactive material
- State the facility locations monitored for possible uncontrolled release of radioactive material
- State the location and setpoint for any uncontrolled release pathway alarm monitors

Facility Name Lesson Outline OS-207

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-207 — Use of protective respiratory equipment

Lesson Topics:

- Explain the purpose of respiratory protection standards and regulations
- Discuss facility controls to ensure only qualified personnel use respiratory equipment
- Identify the training, fitting, and medical qualifications required for use of respiratory equipment
- Identify the types of respiratory equipment available and the specific conditions required for each use
- Discuss how to use a Radiological (Radiation) Work Permit to determine respiratory equipment requirements
- Discuss the safety checks required prior to use of respiratory equipment
- Demonstrate how to properly don all types of facility respiratory equipment
- Demonstrate how to properly remove all types of facility respiratory equipment
- Discuss the minimum specifications for the breathing air used in forced fed respiratory equipment

Facility Name Lesson Outline OS-208

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-208 — Use of protective clothing

Lesson Topics:

- Explain the purpose of personnel contamination control standards and regulations
- State the purpose of using protective clothing in contamination areas
- Identify the training and qualifications required for use of protective clothing
- Identify the types of protective clothing available and the specific conditions required for each use
- Discuss how to use a Radiological (Radiation) Work Permit to determine protective clothing requirements
- Discuss the checks required prior to use of protective clothing
- Demonstrate how to properly don all types of facility protective clothing
- Demonstrate how to properly remove all types of facility protective clothing
- Discuss the required actions for torn or damaged protective clothing while in a radiologically controlled area

Facility Name Lesson Outline OS-209

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-209 — Injured person in a radiologically controlled area actions

Lesson Topics:

- List and explain all initial actions to be taken for an injured person in a radiologically controlled area
- State the item of primary concern when an injury occurs in a radiologically controlled area
- State the factors that affect the decision to move an injured person in a radiologically controlled area
- List the practices to follow when removing a worker that has sustained a minor injury while working in a radiologically controlled area
- State the factors that affect the decision for exposing rescue personnel
- State the criteria for requesting outside medical assistance

Facility Name Lesson Outline OS-210

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-210 — Basic concepts and components of pumps

Lesson Topics:

- List the types of pumps in use at the facility and describe the components and design information
- List the major pumps at the facility and explain the system applications
- Locate the power supply to each of the pumps listed above
- List any automatic features associated with facility pumps
- Using the applicable system procedure/reference demonstrate the following for each major pump at the facility:
  - Start up the pump
  - Monitor normal pump operation
  - Shut down the pump
- For each major pump at the facility, discuss how a pump failure will affect system and facility operation

Facility Name Lesson Outline OS-211

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-211 — Basic concepts and components of valves

Lesson Topics:

- List the types of valves in use at the facility and describe the components
- List the major valves at the facility and explain the system applications
- Using the applicable system reference/procedure demonstrate the ability to operate each major valve at the facility as follows:
  - Remotely (if applicable)
  - Manually
- For each major valve at the facility, discuss how a valve failure will affect system and facility operation

Facility Name Lesson Outline OS-212

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-212 — Basic concepts and components of valve operators

Lesson Topics:

- List the types of remote valve operators in use at the facility and describe the components

- List the major valves at the facility having remote operation capability and describe the following for each valve:

  - Type of remote operator
  - Locations for local and remote operations
  - Failure mode for a loss of remote operation capability
  - Actions required for manual local operation of the valve
  - Any automatic operation capability
  - Power supply for any motor or solenoid operated valve
  - Source of air for any air operated valve

- For each remotely operated valve at the facility, discuss how a valve operator failure will affect system and facility operation

Facility Name Lesson Outline OS-213

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-213 — Basic concepts and components of filters and strainers

Lesson Topics:

- List the major types of filters in use at the facility and describe the construction and design information
- List the major types of strainers in use at the facility and describe the construction and design information
- List the major system applications for filters at the facility
- List the major system applications for strainers at the facility
- List any automatic actions associated with filter and/or strainer operation at the facility

Facility Name Lesson Outline OS-214

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-214 — Basic concepts and components of steam traps

Lesson Topics:

- State the purpose of any steam traps in use at the facility
- List the types of steam traps in use at the facility and describe the construction
- List the major system applications for steam traps at the facility

Facility Name Lesson Outline OS-215

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-215 — Basic concepts and components of heat exchangers

Lesson Topics:

- List the types of heat exchangers in use at the facility and describe the construction and design information
- List the system applications for heat exchangers at the facility
- Discuss the procedures to monitor heat exchanger performance:
  - Heat transfer
  - Tube leaks
  - Plugged tubes

Facility Name Lesson Outline OS-216

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-216 — Basic concepts and components of air compressors

Lesson Topics:

- List the types of air compressors in use at the facility and describe the components and design information
- List the system applications for air compressors at the facility (major system air loads)
- Locate the power supply to each of the air compressors listed above
- Describe the cooling method for each facility air compressor
- List any automatic features associated with the facility air compressors
- Describe the facility air compressor support systems
- For each air compressor at the facility, discuss how an air compressor failure will affect system and facility operation

Facility Name Lesson Outline OS-217

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-217 — Basic concepts and components of diesel generators

Lesson Topics:

- List the diesel generators in use at the facility and describe the components and design information
- Explain the diesel generator/facility electrical distribution/offsite power supply relationship
- List any automatic features associated with the facility diesel generators.
- Describe the facility diesel generator support systems
- For each diesel generator at the facility, discuss how a diesel generator failure will affect facility operation

Facility Name Lesson Outline OS-218

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-218 — Basic concepts and components of electrical distribution

Lesson Topics:

- List the facility alternating current (AC) and direct current (DC) electrical distribution system voltages
- List and locate all facility electrical distribution transformers, switchboards, load centers, motor control centers
- List and locate all facility battery systems
- Discuss the safety precautions for working around batteries
- Discuss the facility electrical safety procedures and regulations
- Describe onsite and offsite power sources for the facility electrical distribution system
- List any automatic features associated with the facility electrical distribution system
- List and locate all facility electrical distribution system emergency support equipment
- For the facility electrical distribution system, discuss how specific failures affect the system and the facility
- Discuss facility emergency/abnormal procedures for electrical distribution system failures

Facility Name Lesson Outline OS-219

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-219 — Basic concepts and components of instrumentation and control

Lesson Topics:

- List the basic types of control systems in use at the facility and describe the components and design information
- List the basic instrumentation systems in use at the facility and describe the components and design information
- List any automatic features associated with the facility instrumentation systems
- List any automatic features associated with the facility control systems
- For each instrumentation system at the facility, discuss how instrument failures will affect the system being monitored and the facility
- For each control system at the facility, discuss how control failures will affect the system being controlled and the facility

Facility Name Lesson Outline OS-220

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-220 — Basic concepts and components of heating, ventilating and air conditioning

Lesson Topics:

- List all facility heating, ventilating, and air conditioning (HVAC) systems and the areas they supply
- For each facility HVAC system, describe the components and design information
- List the power supplies to each of the HVAC systems listed above
- List any automatic features associated with the facility HVAC systems
- Describe and discuss the basic air conditioning and refrigeration cycle
- List and describe the different modes of operation of the facility ventilation systems
- Describe the basic interrelationship between the facility HVAC systems and other facility systems (i.e., radiation monitoring)
- For each facility HVAC system, discuss how a failure will affect the area supplied by that system and the facility
- Discuss the safety precautions and regulations regarding use and handling of refrigerant (i.e., Freon)

Facility Name Lesson Outline OS-221

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-221 — Basic concepts and components of refrigeration

Lesson Topics:

- List all facility refrigeration systems and the specific application
- For each facility refrigeration system, describe the components and design information
- List the power supplies to each of the refrigeration systems listed above
- List any automatic features associated with the facility refrigeration systems
- Describe and discuss the basic air conditioning and refrigeration cycle
- Describe the basic interrelationships between the facility refrigeration systems and other facility systems
- For each facility refrigeration system, discuss how a failure will affect the area supplied by that system and the facility
- Discuss the safety precautions and regulations regarding use and handling of refrigerant (i.e., Freon)

Facility Name Lesson Outline OS-222

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-222 — Basic concepts and components of test equipment

Lesson Topics:

- List the major test equipment in use at the facility and the applications for each
- Discuss the calibration, operation, and safety checks required prior to using facility test equipment

Facility Name Lesson Outline OS-223

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-223 — Basic concepts and components of rigging and lifting equipment

Lesson Topics:

- List the rigging and lifting equipment available at the facility
- For each type of rigging and lifting equipment discuss its specific applications, capacity, safety limits, and any limitations on its use
- Discuss the safety precautions and regulations regarding the use of any facility rigging and lifting equipment
- Discuss the operational, physical inspection, and safety checks required prior to using any facility rigging and lifting equipment
- Discuss facility emergency/abnormal procedures for rigging and lifting equipment failures while handling radioactive materials

Facility Name Lesson Outline OS-224

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-224 — Basic concepts and components of forklifts and similar lifting/transport equipment

Lesson Topics:

- List the forklifts and similar lifting/transport equipment available for use at the facility
- For each type of forklift and similar lifting/transport equipment discuss its specific applications, capacity, safety limits and any limitations on its use
- Discuss the safety precautions and regulations regarding the use of forklifts and similar lifting/transport equipment
- Discuss the operational, physical inspection, and safety checks required prior to using any facility forklift or similar lifting/transport equipment
- Discuss facility emergency/abnormal procedures for forklift or similar lifting/transport equipment failures while handling radioactive materials

Facility Name Lesson Outline OS-225

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-225 — Basic concepts and components of compressed gas systems

Lesson Topics:

- List and locate all facility compressed gas systems including the type of gas and the normal system pressures
- For each compressed gas system listed above, discuss its specific applications at the facility
- For each compressed gas system listed above, describe its components and design information
- List any automatic features associated with the facility compressed gas systems
- Discuss the hazards associated with each compressed gas system listed above
- Locate and discuss all methods to isolate facility compressed gas systems in an emergency
- Discuss the safety precautions and regulations regarding the use of compressed gas systems at the facility
- Discuss the facility emergency/abnormal procedures for compressed gas uncontrolled releases, explosions, exposure to personnel, etc.

Facility Name Lesson Outline OS-226

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-226 — Basic concepts and components of fire suppression systems

Lesson Topics:

- List all fire suppression systems in use at the facility
- For the facility fire suppression systems listed above, discuss the following:
  - Type of system (water, CO_2, Halon, etc.)
  - Components and design information
  - Type of fire each is designed to suppress/extinguish
  - Specific facility area covered by each system
  - Automatic actuation features
  - Manual actuation capability and locations of stations
  - Personnel hazards during use/actuation of each system
- Describe the facility fire detection and alarm system and its interrelationships with the facility fire suppression systems
- Identify facility alternate sources of water and pumping power for the facility fire water system
- Discuss facility emergency/abnormal procedures for fire suppression, detection, and alarm system failures

Facility Name Lesson Outline OS-227

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-227 — Basic concepts and components of radiation monitoring system

Lesson Topics:

- List all permanently installed radiation monitoring systems in use at the facility

- For the permanently installed radiation monitoring systems listed above, discuss the following:

  - Specific facility areas/points monitored
  - System components and design information
  - Type of radiation/activity being monitored
  - Automatic features associated with the system
  - Remote and local alarm and indication capability

- List all temporary (portable, non-hand held) radiation monitoring systems in use at the facility

- For the temporary radiation monitoring systems listed above, discuss the following:

  - Specific facility areas/points monitored
  - System components and design information
  - Types of radiation/activity being monitored
  - Automatic features associated with the system
  - Remote and local alarm and indication capability

Facility Name Lesson Outline OS-228

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-228 — Basic concepts and components of domestic water system

Lesson Topics:

- Describe the facility basic domestic water system layout including the following:

  - System components and design information
  - Location of major system components
  - Interrelationships with other facility systems

- Describe the normal and backup sources of water to the facility domestic water system

- Discuss how a failure of the domestic water system will affect the facility

Facility Name Lesson Outline OS-229

Program: OS — Operations Specialist

Phase: B — Core Practical Training

Course: OS-200

Lesson Outline: OS-229 — Basic concepts and components of communications systems

Lesson Topics:

- List all facility communications systems and discuss the following about each:

  - Type of system (radio, telephone, etc.)
  - System components and design information
  - Specific system use limitations and restrictions
  - Locations of communication stations as applicable
  - Preferential system(s) for normal communications
  - Preferential system(s) for emergency communications
  - Power supplies for each system
  - Systems available during power outages/blackouts

- List all facility alarm systems and discuss the following about each:

  - Specific conditions requiring the sounding of each alarm
  - Distinctive alarm sound
  - Locations of all alarm stations
  - Initial response actions for all alarms
  - Automatic features associated with each alarm system

Facility Name Lesson Outline OS-301

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-301 — Use facility/federal radiological protection standards

Lesson Topics:

- Identify the federal radiological protection standards and regulations applicable to this facility
- Identify the facility-specific radiological protection standards and regulations
- Describe any differences between the federal and facility-specific radiological protection standards and regulations
- State the purposes of the facility administrative radiation control levels
- Identify the federal radiation dose limits and facility administrative control levels
- State the facility policy concerning prenatal radiation exposure
- Identify the employee's responsibilities concerning radiation dose limits and administrative control levels
- Describe the action a worker should take if he/she suspects that dose limits or administrative control levels are being approached or exceeded

Facility Name Lesson Outline OS-302

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-302 — Explain ALARA and the methods used for implementation

Lesson Topics:

- State the definition for the acronym ALARA
- Discuss the function of the facility ALARA committee
- Discuss the reasons for minimizing or reducing facility personnel radiation exposure
- Discuss the individual's responsibilities in regards to ALARA
- Discuss the means for an individual worker to provide input and recommendations to the ALARA committee
- State the specific methods by which radiation exposures have been or will be minimized at this facility based on ALARA committee recommendations

Facility Name Lesson Outline OS-303

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-303 — Explain how the Operations Department documents work

Lesson Topics:

- List the types of records and reports that the Operations Department is responsible for maintaining at this facility

- Explain the requirements for the records management system, such as Quality Control/Quality Assurance, auditability/retrievability, and management information at this facility

- Describe the types of records and reports used by the Operations Department at this facility, including but not limited to:

  - Facility/system operating logs
  - Equipment clearance and tagouts
  - Maintenance work requests
  - Equipment status logs
  - Confined space entry permits
  - Temporary modifications and jumpers
  - Facility/system operating procedures
  - Facility/system emergency/abnormal procedures
  - Facility/system surveillance/testing procedures
  - Facility emergency plan procedures
  - System/equipment technical manuals
  - System/equipment drawings and prints

Facility Name Lesson Outline OS-304

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-304 — Use onsite and offsite communications

Lesson Topics:

- Explain the importance of onsite and offsite communications systems (normal and emergency)
- Describe the methods of maintaining professional communications when using facility communications systems including the phonetic alphabet and "repeat backs"
- Identify areas of restricted use for each facility communication system and why use is restricted
- Locate and demonstrate the ability to use all facility communications equipment
- Explain how to contact key facility personnel and organizations using all applicable communications systems:
  - Shift manager
  - Work supervisor
  - Fire/emergency personnel
  - Security personnel
- Explain how to contact key offsite personnel and organizations using all applicable communications systems:
  - Fire/emergency personnel
  - Medical personnel
  - Nuclear Regulatory Commission
  - State and local agencies
- Describe the application for communication systems and equipment to accomplish the following: direct work activities, perform tests, emergencies
- Discuss and demonstrate the proper methods for face-to-face communications

Facility Name Lesson Outline OS-305

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-305 — Operate all rigging and lifting equipment

Lesson Topics:

- Locate and review applicable procedures/references for all facility rigging and lifting equipment
- Perform all applicable operational, physical inspection, and safety checks prior to using rigging and lifting equipment
- Demonstrate the ability to safely and correctly use all facility rigging and lifting equipment
- Demonstrate the required actions for rigging and lifting equipment failure while handling radioactive materials

Facility Name Lesson Outline OS-306

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-306 — Operate forklifts and similar lifting/transport equipment

Lesson Topics:

- Locate and review applicable procedures/references for all facility forklifts and similar lifting/transport equipment
- Perform all applicable operational, physical inspection, and safety checks prior to using forklifts and similar lifting/transport equipment
- Demonstrate the ability to safely and correctly use all facility forklifts and similar lifting/transport equipment
- Demonstrate the required actions for forklift and similar lifting/transport equipment failure while handling radioactive materials

Facility Name Lesson Outline OS-307

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-307 — Operate air compressors

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, demonstrate the ability to perform the following for all facility air compressors and systems:
  - Prestartup checks and inspections
  - Startup
  - Monitor normal operations
  - Shutdown
  - Applicable surveillance testing
  - Actions for alarms and abnormal conditions

Facility Name Lesson Outline OS-308

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-308 — Operate diesel generators

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, demonstrate the ability to perform the following for all facility diesel generators and systems:
  - Prestartup checks and inspections
  - Automatic startup
  - Manual startup
  - Monitor normal operations
  - Shutdown
  - Applicable surveillance testing
  - Actions for alarms and abnormal conditions

Facility Name Lesson Outline OS-309

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-309 — Operate the electrical distribution system

Lesson Topics:

- Locate and review the applicable procedures/references
- Demonstrate knowledge of all facility electrical safety procedures and regulations
- Using the applicable procedures/references, demonstrate the ability to perform the following for the facility electrical distribution system:
    - Monitor normal operations
    - Rack out all types of system breakers
    - Rack in all types of system breakers
    - Local manual operation of all system breakers
    - Remote operation of all system breakers
    - Energize/deenergize all loads from normal power
    - Energize/deenergize all loads from diesel generators
    - Actions for alarms and abnormal conditions
    - Place battery charger in service
    - Remove battery charger from service
    - Applicable surveillance testing

Facility Name Lesson Outline OS-310

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-310 — Operate the instrumentation and control system

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, demonstrate the ability to perform the following for all facility instrumentation and control systems
  - Monitor normal operations
  - Applicable surveillance testing
  - Actions for alarms and abnormal conditions

Facility Name Lesson Outline OS-311

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-311 — Operate the heating, ventilating, and air conditioning systems

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, demonstrate the ability to perform the following for all facility heating, ventilating, and air conditioning systems:
  - Prestartup checks and inspections
  - Startup
  - Monitor normal operations
  - Shutdown
  - Applicable surveillance testing
  - Actions for alarms and abnormal conditions

Facility Name Lesson Outline OS-312

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-312 — Operate the refrigeration equipment

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, demonstrate the ability to perform the following for all facility refrigeration systems:
  - Prestartup checks and inspections
  - Startup
  - Monitor normal operations
  - Shutdown
  - Applicable surveillance testing
  - Actions for alarms and abnormal conditions

Facility Name Lesson Outline OS-313

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-313 — Operate the compressed gas systems

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, demonstrate the ability to perform the following for all facility compressed gas systems:
  - System lineups and inspections
  - Placing system in service
  - Monitor normal operations
  - Removing system from service
  - Actions for alarms and abnormal conditions

Facility Name Lesson Outline OS-314

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-314 — Discuss the low-level radioactive waste at the facility

Lesson Topics:

- List all low-level radioactive waste types currently stored at the facility
- List the specific storage locations for each type of waste
- Discuss the access requirements for each storage location
- Discuss the radiological and safety precautions associated with each type of waste
- Discuss the radiological monitoring requirements while handling each type of low-level radioactive waste
- Describe the monitoring requirements while low-level radioactive waste is held in storage

Facility Name Lesson Outline OS-315

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-315 — Describe the specific waste storage areas at the facility

Lesson Topics:

- List the specific facility low-level radioactive waste storage locations
- Describe the construction of each storage area listed above
- Describe personnel and equipment access requirements for each facility storage location
- For each facility storage area listed above, describe and discuss the following:
    - Security systems
    - Fire detection, alarm and suppression systems
    - Heating, ventilating, and air conditioning systems
    - Radiation monitoring systems
    - Storage capacity limitations and requirements
    - Expected radiation levels
    - Communications systems available

Facility Name Lesson Outline OS-316

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-316 — Describe the waste handling equipment used at the facility

Lesson Topics:

- List and describe all waste handling equipment available at the facility
- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following for all facility waste handling equipment:
  - Specific applications and limitations
  - Specific operator certifications required for use
- Using the applicable procedures/references, demonstrate the ability to perform the following for all facility waste handling equipment:
  - Preuse safety checks and inspections
  - Safety precautions while in use
  - Lift/move/transport all facility waste storage containers
  - Applicable surveillance testing
  - Actions for equipment failure and abnormal conditions

Facility Name Lesson Outline OS-317

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-317 — Operate and monitor the radiation monitoring system

Lesson Topics:

- List the facility radiation monitoring systems (portable and fixed) that an Operations Specialist is responsible for operating and monitoring

- Using the applicable procedures/references, demonstrate the ability to perform the following for all facility radiation monitoring systems:

  - Preuse safety checks and inspections
  - Applicable surveillance testing
  - Normal operations
  - Actions for alarms and abnormal conditions

Facility Name Lesson Outline OS-318

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-318 — Perform actions for receiving radioactive waste

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following for receiving a low-level radioactive waste shipment:
  - Shipment documentation/paperwork
  - Security requirements
  - Health Physics coverage requirements
  - Step-by-step actions for receiving and storing a shipment
  - Actions for abnormal conditions
- Using the applicable procedures/references, demonstrate the ability to perform the Operations Specialist-required actions for receiving a low-level radioactive waste shipment

Facility Name Lesson Outline OS-319

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-319 — Perform actions for shipping radioactive waste

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following for shipping low-level radioactive waste:
  - Shipment documentation/paperwork
  - Security requirements
  - Health Physics coverage requirements
  - Step-by-step actions for preparing and shipping waste
  - Actions for abnormal conditions
- Using the applicable procedures/references, demonstrate the ability to perform the Operations Specialist-required actions for shipping low-level radioactive waste

Facility Name Lesson Outline OS-320

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-320 — Perform actions for moving waste within the facility

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following for handling and moving low-level radioactive waste within the facility:
  - Shipment documentation/paperwork
  - Security requirements
  - Health Physics coverage requirements
  - Step-by-step actions for handling and moving waste
  - Actions for abnormal conditions
- Using the applicable procedures/references, demonstrate the ability to perform the Operations Specialist-required actions for handling and moving low-level radioactive waste within the facility

Facility Name Lesson Outline OS-321

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-321 — Perform all buildings and grounds maintenance

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss all facility buildings and grounds maintenance under the responsibility of an Operations Specialist
- Using the applicable procedures/references, demonstrate the ability to perform all facility buildings and grounds maintenance under the responsibility of an Operations Specialist

Facility Name Lesson Outline OS-322

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-322 — Operate the domestic water system

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, demonstrate the ability to perform the following for the facility domestic water system:
  - System lineups and inspections
  - Placing system in service
  - Monitor normal operation
  - Removing system from service
  - Actions for alarms and abnormal conditions

Facility Name Lesson Outline OS-323

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-323 — Perform emergency response team (fire brigade) responsibilities

Lesson Topics:

- Describe and discuss the facility emergency situations that would require activation of the emergency response team
- Describe and discuss the Operations Specialist responsibilities as a member of the emergency response team
- List the locations and describe the contents of all facility emergency response team equipment lockers
- For all facility emergency breathing equipment, describe and discuss the following:
  - Types, specifications, and limitations
  - Equipment locations
  - Specific conditions requiring/allowing use of each type
- Discuss personnel radiation exposure criteria and limits during emergency situations
- Demonstrate the ability to perform the following for all facility emergency response team equipment:
  - Preuse safety checks and inspections
  - Use during simulated emergency conditions
  - Post-use inspections and storage
- Describe and discuss the facility communications procedures and systems specifically designated for use during emergencies

Facility Name Lesson Outline OS-324

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-324 — Perform actions for waste storage container failure

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following for a waste storage container failure:
  - Indications/symptoms
  - Entry conditions
  - Immediate actions
  - Subsequent or supplementary actions
  - Specific Operations Specialist responsibilities
  - Reportability requirements
  - Post-failure documentation

Facility Name Lesson Outline OS-325

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-325 — Perform actions for waste storage container handling equipment failure

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following for waste storage container handling equipment failure:
  - Indications/symptoms
  - Entry conditions
  - Immediate actions
  - Subsequent or supplementary actions
  - Specific Operations Specialist responsibilities
  - Reportability requirements
  - Post-failure documentation

Facility Name Lesson Outline OS-326

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-326 — Perform actions for civil disturbance or acts of violence

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following for civil disturbance or acts of violence on or outside facility property:
  - Indications/symptoms
  - Entry conditions
  - Immediate actions
  - Subsequent or supplementary actions
  - Specific Operations Specialist responsibilities
  - Reportability requirements
  - Post-event documentation

Facility Name Lesson Outline OS-327

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-327 — Perform actions for facility evacuation emergency

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following for a facility evacuation emergency:
  - Specific conditions requiring an evacuation
  - Alarms and public address announcements directing evacuation
  - Specific evacuation assembly areas
  - Specific routes to evacuation assembly areas
  - Personnel accountability
  - Specific Operations Specialist responsibilities
  - Reportability requirements
  - Post-event documentation

Facility Name Lesson Outline OS-328

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-328 — Perform actions for facility take cover emergency

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following for a facility take cover emergency:
  - Specific conditions requiring personnel to take cover
  - Alarms and public address announcements directing personnel to take cover
  - Specific take cover areas
  - Specific routes to take cover areas
  - Personnel accountability
  - Specific Operations Specialist responsibilities
  - Reportability requirements
  - Post-event documentation
  - Post-fire equipment inventory, etc.

Facility Name Lesson Outline OS-329

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-329 — Perform actions for fire on facility property

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following for a fire on facility property:
  - Indications/symptoms
  - Entry conditions
  - Immediate actions for emergency response team personnel
  - Immediate actions for other facility personnel
  - Subsequent or supplementary actions
  - Criteria for requesting offsite firefighting assistance
  - Reportability requirements
  - Post-event documentation
  - Post-fire equipment inventory, etc.

Facility Name Lesson Outline OS-330

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-330 — Perform actions for fire off facility property

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following for a fire off facility property:
  - Indications/symptoms
  - Entry conditions
  - Immediate actions for emergency response team personnel
  - Immediate actions for other facility personnel
  - Subsequent or supplementary actions
  - Criteria for using facility emergency response team
  - Criteria for requesting offsite firefighting assistance
  - Reportability requirements
  - Post-event documentation

Facility Name Lesson Outline OS-331

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-331 — Perform actions for loss or impairment of emergency response equipment

Lesson Topics:

- Locate and review applicable procedures/references
- Explain the criteria for, and the indications of, a loss or impairment of emergency response equipment
- Using the applicable procedures/references, describe and discuss the following for a loss or impairment of emergency response equipment:
  - Immediate actions
  - Specific compensatory actions for the loss or impairment
  - Subsequent or supplementary actions
  - Specific Operations Specialist responsibilities
  - Reportability requirements
  - Required documentation

Facility Name Lesson Outline OS-332

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-332 — Perform actions for loss or impairment of evacuation or take cover system

Lesson Topics:

- Locate and review applicable procedures/references
- Explain the criteria for, and the indications of, a loss or impairment of evacuation or take cover system
- Using the applicable procedures/references, describe and discuss the following for a loss or impairment of evacuation or take cover system:
  - Immediate actions
  - Specific compensatory actions for the loss or impairment
  - Subsequent or supplementary actions
  - Specific Operations Specialist responsibilities
  - Reportability requirements
  - Required documentation

Facility Name Lesson Outline OS-333

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-333 — Perform actions for loss or impairment of onsite and offsite communications systems

Lesson Topics:

- Locate and review applicable procedures/references
- Explain the criteria for, and indications of, a loss or impairment of onsite and offsite communications systems
- List and explain the use of any alternate onsite and offsite communications systems
- Using the applicable procedures/references, describe and discuss the following for a loss or impairment of the onsite and offsite communications systems:
  - Immediate actions
  - Specific compensatory actions for the loss or impairment
  - Subsequent or supplementary actions
  - Specific Operations Specialist responsibilities
  - Reportability requirements
  - Required documentation

Facility Name Lesson Outline OS-334

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-334 — Perform actions for loss or impairment of domestic water system

Lesson Topics:

- Locate and review applicable procedures/references
- Explain the criteria for, and indications of, a loss or impairment of the domestic water system
- List and explain the use of any alternate domestic water systems
- Using the applicable procedures/references, describe and discuss the following for a loss or impairment of the domestic water system:
    - Immediate actions
    - Specific compensatory actions for the loss or impairment
    - Subsequent or supplementary actions
    - Specific Operations Specialist responsibilities
    - Reportability requirements
    - Required documentation

Facility Name Lesson Outline OS-335

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-335 — Perform actions for loss or impairment of electrical distribution system

Lesson Topics:

- Locate and review applicable procedures/references
- Explain the criteria for, and indications of, a loss or impairment of the facility electrical distribution system
- List and explain the use of any alternate electrical power source systems
- Using the applicable procedures/references, describe and discuss the following for a loss or impairment of the facility electrical distribution system:
  - Immediate actions
  - Specific compensatory actions for the loss or impairment
  - Subsequent or supplementary actions
  - Specific Operations Specialist responsibilities
  - Reportability requirements
  - Required documentation

Facility Name Lesson Outline OS-336

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-336 — Perform actions for loss or impairment of fire detection, alarm and suppression systems

Lesson Topics:

- Locate and review applicable procedures/references
- Explain the criteria for, and indications of, a loss or impairment of the facility fire detection, alarm, and suppression systems
- List and explain the use of any alternate fire detection, alarm, and suppression systems
- Using the applicable procedures/references, describe and discuss the following for a loss or impairment of the fire detection, alarm, and suppression systems:
  - Immediate actions
  - Specific compensatory actions for the loss or impairment
  - Subsequent or supplementary actions
  - Specific Operations Specialist responsibilities
  - Reportability requirements
  - Required documentation

Facility Name Lesson Outline OS-337

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-337 — Perform actions for loss or impairment of heating, ventilating and air conditioning systems

Lesson Topics:

- Locate and review applicable procedures/references
- Explain the criteria for, and indications of, a loss or impairment of facility heating, ventilating, and air conditioning (HVAC) systems
- List and explain the use of any alternate HVAC systems
- Using the applicable procedures/references, describe and discuss the following for a loss or impairment of the HVAC systems:
  - Immediate actions
  - Specific compensatory actions for the loss or impairment
  - Subsequent or supplementary actions
  - Specific Operations Specialist responsibilities
  - Reportability requirements
  - Required documentation

Facility Name Lesson Outline OS-338

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-338 — Perform actions for radiological casualties

Lesson Topics:

- Locate and review applicable procedures/references
- List and discuss the following regarding radiological casualties at the facility:
  - Specific types of casualties possible
  - Alarms and other automatic indications
  - Other indications
  - Any automatic actions
  - Specific personnel and facility hazards for each casualty
  - Specific methods for dealing with each casualty
- Using the applicable procedures/references, describe and discuss the following for each radiological casualty at the facility:
  - Immediate actions
  - Subsequent or supplementary actions
  - Take cover and evacuation requirements
  - Criteria for requesting offsite assistance
  - Specific Operations Specialist responsibilities
  - Reportability requirements
  - Required documentation

Facility Name Lesson Outline OS-339

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-339 — Perform actions for loss or impairment of radiation monitoring systems

Lesson Topics:

- Locate and review applicable procedures/references
- Explain the criteria for, and indications of, a loss or impairment of facility radiation monitoring systems
- List and explain the use of any alternate radiation monitoring systems
- Using the applicable procedures/references, describe and discuss the following for a loss or impairment of the radiation monitoring systems:
  - Immediate actions
  - Specific compensatory actions for the loss or impairment
  - Subsequent or supplementary actions
  - Specific Operations Specialist responsibilities
  - Reportability requirements
  - Required documentation

Facility Name Lesson Outline OS-340

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-340 — Perform onsite and offsite notifications during emergency or abnormal situations

Lesson Topics:

- Locate and review applicable procedures/references
- List and discuss the specific facility events requiring onsite and offsite notifications to be made
- Using the applicable procedures/references, describe and discuss the following for onsite and offsite notifications during an emergency or abnormal situation:
  - Specific actions to make notifications
  - Preferred and alternate communication systems
  - Approvals required for offsite notifications
  - Documentation required

Facility Name Lesson Outline OS-341

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-341 — Locate all facility areas and emergency equipment

Lesson Topics:

- Given a map of the facility and/or while on a tour, locate the following areas:

  - Access control for radiologically controlled areas
  - Evacuation and take cover assembly areas
  - Safety office
  - Warehouse
  - Supervisors' offices
  - Maintenance shops
  - Hot machine shop
  - Respiratory protection equipment storage/issue
  - Emergency response facilities
  - Controlled material storage areas
  - Specific low-level radioactive waste storage areas
  - Areas with equipment/personnel access restrictions

- For each of the areas listed above, describe and discuss the following:

  - Emergency equipment storage locations and inventory
  - Fire detection, alarm, and suppression systems
  - Normal and emergency communication systems
  - Normal and emergency entrances and exits
  - Major facility equipment locations

Facility Name Lesson Outline OS-342

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-342 — Discuss all safety regulations applicable for an Operations Specialist

Lesson Topics:

- Locate and review applicable procedures/references

- Using the applicable procedures/references, describe and discuss the following Operations Specialist task-related safety concerns:

  - Welding and grinding
  - High voltage or energized electrical equipment and panels
  - Rotating equipment
  - High noise areas
  - Adverse weather conditions
  - Heat stress areas
  - High temperature or high pressure equipment
  - Work being performed overhead
  - Moving heavy loads
  - Over or near water
  - Being in or near radiation or high radiation areas
  - Being in radiologically controlled areas
  - Hazardous chemicals
  - Compressed gas systems
  - Asbestos materials
  - Activities generating airborne dust, particles, and debris
  - Confined spaces
  - Vehicle operation
  - Heavy equipment operation
  - Flammable liquids

Facility Name Lesson Outline OS-343

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-343 — Perform actions for a vehicle accident

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following for a vehicle accident on facility property:
  - Indications and symptoms
  - Entry conditions
  - Immediate actions
  - Subsequent or supplementary actions
  - Specific Operations Specialist responsibilities
  - Reportability requirements
  - Post-event documentation
- Discuss how the above actions will differ if the vehicle is carrying radioactive material

Facility Name Lesson Outline OS-344

Program: OS — Operations Specialist

Phase: C — Facility-Specific Practical Training

Course: OS-300

Lesson Outline: OS-344 — Perform actions for a heavy equipment accident

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following for a heavy equipment accident on facility property:
  - Indications and symptoms
  - Entry conditions
  - Immediate actions
  - Subsequent or supplementary actions
  - Specific Operations Specialist responsibilities
  - Reportability requirements
  - Post-event documentation
- Discuss how the above actions will differ if the heavy equipment is carrying radioactive material

Appendix B

Health Physics Technician Training Program

CONTENTS

B-1 Health Physics Technician Training Program B-5

B-1.1 Applicability B-5

B-1.2 Program Entry Requirements B-5

B-1.2.1 Level of Education B-5
B-1.2.2 Experience B-5
B-1.2.3 Physical Attributes B-6

B-1.3 Training Waiver Policy B-6

B-1.3.1 No Previous Experience B-6
B-1.3.2 Experience at Facilities Not Subject to Licensing B-7
B-1.3.3 Experience at Comparable Facilities Subject to Licensing B-7

B-1.4 Position Certification Requirements B-7

B-1.5 Work Without Certification Policy B-8

B-1.6 Records Maintenance B-8

B-1.7 Training Matrix B-9

B-1.8 Continuing Training Program B-9

B-1.9 Training Records B-10

B-1.10 References B-10

Attachment 1 Health Physics Technician Training Matrix B-11

Attachment 2 Health Physics Technician Certification Record B-19

Attachment 3 Health Physics Technician Lesson Outlines B-29

TABLES

1-1. Academic Training B-13

1-2. Core Practical Training B-14

1-3. Facility-Specific Practical Training B-16

Appendix B

B-1 Health Physics Technician Training Program

B-1.1 Applicability

The training program described in this appendix is applicable to the training of Health Physics Technicians at low-level radioactive waste (LLW) disposal facilities. The individuals successfully participating in and completing this program will be certified as Health Physics Technicians and will be responsible for, but not limited to, performing surveys, source leak tests, equipment performance tests, posting areas, responding to alarms and emergency situations; and additional duties as applicable.

Facilities wishing to employ persons (after the initial receipt of radioactive waste) who are not fully certified as Health Physics Technicians can designate a position of Apprentice Health Physics Technician. This individual may, while in training to certify, perform some tasks of the Health Physics Technician subject to the conditions of Section B-1.5 of this appendix if they have met the requirements for General Employee and Radiological Worker Training as described in Appendix D of this curriculum.

Also facilities may wish to have a position equivalent to Senior Health Physics Technician who, while not certified to be a supervisor, could make decisions on technical matters relating to the facility's health physics work tasks. This person will have held and maintained certification as a Health Physics Technician for at least one year(s). (This position may be considered equivalent of an apprentice position for Health Physics Supervisor.)

B-1.2 Program Entry Requirements

The requirements for entry into the Health Physics Technician Training Program will be determined by the Facility Manager, Health Physics Supervisor, and the Facility Training Supervisor. Factors that should be used for determining eligibility for this program include:

B-1.2.1 Level of Education

A high school diploma (or GED equivalent) is required.

B-1.2.2 Experience

The following experience level category options are available and may be used:

- None, if hired as an Apprentice Health Physics Technician
- Fully certified Health Physics Technician at another or commercial nuclear facility (see Section B-1.3)

- Engineering Laboratory Technician in the Navy Nuclear Power Program or a Health Physics/Radiation Protection Technician at a U.S. Government-run nuclear facility (see Section B-1.3)

- Two-year associates degree in radiation protection or equivalent from an accredited technical school or junior college

- Bachelor of science degree in health physics, radiation protection, or equivalent from an accredited university.

B-1.2.3 Physical Attributes

Each potential program trainee must meet the following requirements:

- Meets prerequisite conditions of general health as set forth by the facility

- Meets prerequisite conditions for exposure to low levels of radiation

- Has corrected or nonimpaired visual and auditory acuity

- Meets prerequisite criteria for the wearing of respiratory equipment

- Has the manual dexterity needed to use applicable facility health physics equipment

- Meets facility fitness-for-duty criteria

- Has the physical strength/stamina necessary to perform applicable tasks required of a Health Physics Technician.

B-1.3 Training Waiver Policy

Various combinations of the requirements for completion of the initial certification process may be waived on a case-by-case basis. Actual waiver determinations will be made by the Health Physics Supervisor and the Facility Training Supervisor and will be based on the trainee's previous experience levels. The conditions for waiver fall into three categories as described in NUREG-1199:

B-1.3.1 No Previous Experience

This category includes any facility designated Apprentice Health Physics Technicians, persons with a two-year associates degree in radiation protection, or equivalent, and persons with a bachelor of science degree in health physics, radiation protection, or equivalent. These three situations are handled as follows:

1. Apprentice Health Physics Technicians must comply with all four requirements of Section B-1.4 of this appendix with no waivers allowed.

2. Trainees with a two-year associates degree in radiation protection, or equivalent are not required to complete Requirement 1 of Section B-1.4 of this appendix upon presentation of the accredited institution's certified copy of the candidates' official transcript showing the awarding of the degree. These trainees must complete Requirements 2, 3, and 4.

3. Trainees with a bachelor of science degree in health physics, radiation protection or equivalent are not required to complete Requirements 1 and 4 of Section B-1.4 of this appendix upon presentation of the accredited institution's certified copy of the candidates' official transcript showing the awarding of the degree. These trainees must complete training on Requirements 2 and 3.

B-1.3.2 Experience at Facilities Not Subject to Licensing

This category includes Engineering Laboratory Technicians from the Navy Nuclear Power Program or Health Physics/Radiation Protection Technicians from U.S. Government facilities. These trainees are not required to complete Requirements 1 and 4 of Section B-1.4 of this appendix upon presentation of documentation from the U.S. Navy or Department of Energy of certification as a Health Physics/Radiation Protection Technician. These trainees must complete training on Requirements 2 and 3.

B-1.3.3 Experience at Comparable Facilities Subject to Licensing

This category includes Health Physics/Radiation Protection Technicians from other facilities (subject to 10 CFR 20 and 10 CFR 61 licensing) and commercial nuclear facilities (subject to 10 CFR 20 and 10 CFR 50 licensing). These trainees are not required to complete Requirements 1, 2, and 4 of Section B-1.4 of this appendix upon presentation of documentation from a licensed facility or a licensed commercial nuclear facility of certification as a Health Physics/Radiation Protection Technician. These trainees must complete training on Requirement 3.

B-1.4 Position Certification Requirements

The initial certification process consists of four specific and different sections of training and on-the-job experience. The requirements for the specific sections to be completed by each trainee are addressed in Section B-1.3 of this appendix. The four sections are:

1. Phase A. Successful completion of classroom academic training and evaluation (Course HP-100).

2. Phase B. Successful completion of required core practical training and evaluation (Course HP-200).

3. Phase C. Successful completion of required facility-specific practical training and evaluation (Course HP-300).

4. Compliance with the onsite experience requirement of the facility.

Certification of a trainee to a Health Physics Technician position will be made only after ensuring all the requirements of training attendance, training evaluations, physical condition, and job work performance and experience, etc., have been satisfied. When the trainee completes position certification, the Facility Manager is assured the individual is capable of performing all aspects of the tasks for which certification was given. Position certification will be valid indefinitely (unless revoked for cause) and will be reinforced by participation in the continuing training program.

Approval of a trainee's position certification will be the responsibility of the Health Physics Supervisor. The Health Physics Supervisor assumes supervisory control of the department subsequent to certification as both a Health Physics Technician and a Facility Supervisor. In addition, the parent company may desire to be involved in the certification of the Health Physics Technicians as well as the Health Physics Supervisor.

B-1.5 Work Without Certification Policy

Persons initially not certified to perform the duties of the Health Physics Technician would be allowed to perform individual health physics tasks under the following specific conditions:

a. The person is in training to certify as a Health Physics Technician (this would usually be an Apprentice Health Physics Technician) **AND**

b. The trainee has successfully completed and been signed off on the job performance measure (JPM) for the task to be performed **OR**

c. A certified Health Physics Technician is present to direct and monitor the trainee's performance of the task.

This assumes that the individual has met the requirements for General Employee and Radiological Worker Training as described in Appendix D of this curriculum.

B-1.6 Records Maintenance

All training program records of course attendance, course schedules, position certification, lesson plans and outlines, JPMs, on-the-job training, etc., will be maintained in accordance with the LLW disposal facility administrative requirements as described in the facility license.

A master listing of certified Health Physics Technicians will be maintained. This listing will be in a format such that facility supervision is aware of the certification status of all personnel performing health physics tasks. Specifically, the listing should include the following:

a. A list of all facility personnel designated as Senior Health Physics Technician.

- This will include documentation of the individual's certification as a Health Physics Technician for one year(s) to meet requirements for a Senior Health Physics Technician.

b. A list of all facility personnel certified as Health Physics Technician.

- This will include the overall completion date of the certification as well as the satisfactory participation in the facility Continuing Training Program.

c. A list of all facility personnel designated as Apprentice Health Physics Technicians.

- This will include the specific tasks for which they have been trained and associated JPMs that have been signed off. This list determines the tasks they will be allowed to perform without completion of certification per Sections B-1.1 and B-1.5 of this appendix.

B-1.7 Training Matrix

A training matrix (see Attachment 1 of this appendix) will be developed and maintained relating training program information in the format as shown in Section 2.3.15 of this training curriculum. This matrix will outline the specific tasks required to certify as a Health Physics Technician and will delineate the training and evaluation methods needed to provide the trainee the knowledge and skills necessary for certification.

B-1.8 Continuing Training Program

Fully certified Health Physics Technicians will participate in the facility Continuing Training Program. This program will be an ongoing series of specific training topics to be presented using the classroom, self-study, and JPM formats. The topics to be covered during each training period (annually) will be determined by the Health Physics Supervisor and the Facility Training Supervisor. They should cover selected portions of the initial certification requirements per Sections B-1.4, items 1, 2, and 3 of this appendix as well as lessons learned from facility operations and industry related events. The topics for each training period should be chosen such that over a specified period (biennially) facility Health Physics Technicians would be retrained in all areas of their initial certification requirements.

Documentation of individual participation and completion of these requirements will be maintained and subject to the record keeping requirements as set forth in Section B-1.6 of this appendix.

B-1.9 Training Records

The outlines of the courses, lessons, JPMs, and other material comprising the Health Physics Technician Training Program will be maintained and subject to the record keeping requirements set forth in Section B-1.6 of this appendix. This training material should follow the formats of the following attachments in Section 2 of this document:

a. Section 2, Attachment 2—Job Performance Measure

b. Section 2, Attachment 3—Lesson Outline

B-1.10 References

1. Code of Federal Regulations, Title 10, Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

2. U.S. Nuclear Regulatory Commission, *Standard Format and Content of a License Application for a Low-Level Radioactive Waste Disposal Facility*, NUREG-1199.

Appendix B

Attachment 1

Health Physics Technician
Training Matrix

Attachment 1. Health Physics Technician Training Matrix

Table 1-1. Academic Training.[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Perform simple mathematical calculations	TR	CR	WE	HP-101/102	TRNG
Solve simple problems of physical science	TR	CR	WE	HP-103	TRNG
Describe the structure of the atom	TR	CR	WE	HP-104	TRNG
Explain the processes of fission and fusion	TR	CR	WE	HP-104	TRNG
Explain the ways an individual receives radiation	TR	CR	WE	HP-105	TRNG
Describe and measure radioactivity and radioactive decay	TR	CR	WE	HP-106	TRNG
Discuss the ways radiation interacts with matter	TR	CR	WE	HP-107	TRNG
Explain the biological effects of radiation	TR	CR	WE	HP-108	TRNG
Explain the radiological protection standards	TR	CR	WE	HP-109	TRNG
Determine ways to control external radiation exposure	TR	CR	WE	HP-110/111	TRNG
Determine ways to control internal radiation exposure	TR	CR	WE	HP-110/112	TRNG
Explain radiation detector theory	TR	CR	WE	HP-113	TRNG

a.

TR	-	Train	WE	-	Written Exam	CR	-	Classroom	OT	-	Over-Train
NT	-	No-Train	CONT	-	Contract Vendor	SS	-	Self-Study	DEPT	-	Trainee's Department
PT	-	Pre-Train	TRNG	-	Training Department	OJT	-	On-the-Job Training	JPM	-	Job Performance Measure
HP	-	Health Physics									

Attachment 1. Health Physics Technician Training Matrix

Table 1-2. Core Practical Training.[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Complete a performance test on a portable hand-held instrument	TR	OJT	JPM	HP-201	DEPT
Complete a performance test on health physics counting equipment	TR	OJT	JPM	HP-202	DEPT
Perform a loose surface contamination survey	TR	OJT	JPM	HP-203	DEPT
Perform a radiation survey	TR	OJT	JPM	HP-204	DEPT
Obtain and count air samples	TR	OJT	JPM	HP-205	DEPT
Perform a leak test on a radioactive source	TR	OJT	JPM	HP-206	DEPT
Post a radiological area to reflect associated hazards	TR	OJT	JPM	HP-207	DEPT
Perform a radioactive material shipment survey	TR	OJT	JPM	HP-208	DEPT
Respond to a high airborne activity alarm	TR	OJT	JPM	HP-209	DEPT
Respond to an uncontrolled release of radioactive material	TR	OJT	JPM	HP-210	DEPT
Respond to an area high radiation alarm	TR	OJT	JPM	HP-211	DEPT
Respond to an injured person in a radiologically controlled area	TR	OJT	JPM	HP-212	DEPT
Direct and monitor personnel decontamination	TR	OJT	JPM	HP-213	DEPT
Perform monthly computations on total curies of radwaste received	TR	OJT	JPM	HP-214	DEPT
Don and remove protective respiratory equipment	TR	OJT	JPM	HP-215	DEPT
Don and remove protective clothing	TR	OJT	JPM	HP-216	DEPT
Correct for counting errors	TR	OJT	JPM	HP-217	DEPT

a.

TR	-	Train	WE	-	Written Exam	CR	-	Classroom	OT	-	Over-Train
NT	-	No-Train	CONT	-	Contract Vendor	SS	-	Self-Study	DEPT	-	Trainee's Department
PT	-	Pre-Train	TRNG	-	Training Department	OJT	-	On-the-Job Training	JPM	-	Job Performance Measure
HP	-	Health Physics									

Attachment 1. Health Physics Technician Training Matrix

Table 1-2. (continued).[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Explain the method of operation of each type of dosimetry	TR	CR	WE	HP-218	TRNG
Discuss and complete a Radiation Work Permit	TR	CR/SS	WE	HP-219	DEPT
Explain how to maintain coverage in a radiologically controlled area	TR	CR/OJT	JPM	HP-220	DEPT
Use proper methods of personnel decontamination	TR	CR/OJT	JPM	HP-221	DEPT
Describe the instruments available to perform radiation surveys	TR	CR/OJT	WE/JPM	HP-222	DEPT
Describe the principles of operation of radiation detectors	TR	CR	WE	HP-113/223	TRNG
Describe the instruments available to monitor contamination	TR	CR/OJT	WE/JPM	HP-224	TRNG
Describe the equipment available to perform air sampling operations	TR	CR/OJT	WE/JPM	HP-225	DEPT
Describe the operation of the counting room instruments	TR	CR/OJT	WE/JPM	HP-226	DEPT

a.

TR	-	Train	WE	-	Written Exam	CR	-	Classroom	OT	-	Over-Train
NT	-	No-Train	CONT	-	Contract Vendor	SS	-	Self-Study	DEPT	-	Trainee's Department
PT	-	Pre-Train	TRNG	-	Training Department	OJT	-	On-the-Job Training	JPM	-	Job Performance Measure
HP	-	Health Physics									

Attachment 1. Health Physics Technician Training Matrix

Table 1-3. Facility-Specific Practical Training.[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Use facility and federal radiological protection standards	TR	CR/OJT	WE/JPM	HP-301	TRNG
Explain ALARA and the methods used for implementation	TR	CR	WE	HP-110/302	TRNG
Discuss radiological considerations for first aid	TR	CR/SS	WE	HP-303	TRNG
Explain how the Health Physics Department documents its work	TR	CR/SS	WE	HP-304	DEPT
Use onsite and offsite communications systems	TR	CR/SS	WE/JPM	HP-305	TRNG
Identify the major methods of contamination control	TR	CR	WE	HP-306	TRNG
Discuss implementation of the airborne radioactivity control program	TR	CR/SS	WE	HP-307	TRNG
Discuss implementation of the facility respiratory protection plan	TR	CR/SS	WE	HP-308	TRNG
Discuss the procedure for using and storing radioactive sources	TR	CR/SS	WE	HP-309	TRNG
Discuss the facility environmental monitoring program	TR	CR/SS	WE	HP-310	TRNG
Direct shipment/receipt of radioactive materials	TR	SS/OJT	WE/JPM	HP-311	DEPT
Explain facility and Health Physics response to an incident or emergency	TR	CR/OJT	WE/JPM	HP-312	TRNG
29 CFR 1910.120(B)(4)—Emergency response to spill of toxic material	OT	CR/OJT	WE/JPM	HP-313	TRNG
29 CFR 1910.120(e)(1)(i)—Personnel responsible for facility safety	TR	CR/SS	WE	HP-314	TRNG
29 CFR 1910.120(e)(1)(ii)—Awareness of facility safety hazards	TR	CR/SS	WE	HP-315	TRNG
29 CFR 1910.120(e)(1)(iii)—Use of Personal Protective Equipment	TR	CR/SS	WE/JPM	HP-316	TRNG
29 CFR 1910.120(e)(1)(iv)—Work practices to minimize risk	TR	CR/SS	WE	HP-317	TRNG

a.

TR	-	Train	WE	-	Written Exam	CR	-	Classroom	OT	-	Over-Train
NT	-	No-Train	CONT	-	Contract Vendor	SS	-	Self-Study	DEPT	-	Trainee's Department
PT	-	Pre-Train	TRNG	-	Training Department	OJT	-	On-the-Job Training	JPM	-	Job Performance Measure
ALARA	-	as low as reasonably achievable									
CFR	-	Code of Federal Regulations									
HP	-	Health Physics									

Attachment 1. Health Physics Technician Training Matrix

Table 1-3. (continued).[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
29 CFR 1910.120(e)(1)(v)—Engineering controls	TR	CR/OJT	WE	HP-318	TRNG
29 CFR 1910.120(e)(1)(vi)—Symptoms of exposure	TR	CR	WE	HP-319	TRNG
29 CFR 1910.120(e)(3)—Managing hazardous waste operations	TR/OT	CR/OJT	WE	HP-320	TRNG
29 CFR 1910.120(1)(2)(i)—Procedure for handling facility emergency incidents	TR/OT	CR/OJT	WE	HP-321	TRNG
29 CFR 1910.1200(h)(2)(i)—Methods of detecting hazardous materials	TR	CR/OJT	WE	HP-322	TRNG
29 CFR 1910.1200(h)(2)(ii)—Hazards associated with use of facility chemicals	TR/OT	CR/OJT	WE	HP-323	TRNG
29 CFR 1910.1200(h)(2)(iii)—Measures employees can use to protect themselves	TR/OT	CR/OJT	WE	HP-324	TRNG
29 CFR 1910.1200(h)(2)(iv)—Details of Hazard Communications Program (MSDS, etc.)	TR/OT	CR/OJT	WE	HP-325	TRNG

a.

TR	-	Train	WE	-	Written Exam	CR	-	Classroom	OT	-	Over-Train
NT	-	No-Train	CONT	-	Contract Vendor	SS	-	Self-Study	DEPT	-	Trainee's Department
PT	-	Pre-Train	TRNG	-	Training Department	OJT	-	On-the-Job Training	JPM	-	Job Performance Measure
MSDS	-	Material Safety Data Sheet									

Appendix B

Attachment 2

Health Physics Technician Certification Record

Attachment 2

Health Physics Technician Certification Record

The Health Physics Technician Certification Record documents the satisfactory completion of the knowledge and ability requirements of the Health Physics Technician (HPT) Training Program. The Certification Record is divided into the following phases:

Phase A: Health Physics Technician Academics Training (Course HP-100)

- There are 13 generic lessons suggested for inclusion in the academics portion of the training. The facility staff member (supervisor, classroom instructor, or designee) should sign the appropriate blocks upon the trainee's attendance and completion of each lesson. This will include any individual lesson evaluation by written examination or the satisfactory completion of a JPM. The facility instructor assigned the responsibility for Health Physics training signs for the trainee's successful completion of the Academics Training final comprehensive examination with a score of 70% or better.

- In addition to the listed academic lessons, the facility may need additional lessons to meet specific knowledge requirements from the JPMs in the practical training phases (B and C).

Phase B: Health Physics Technician Core Practical Training (Course HP-200)

- There are 26 generic tasks suggested for inclusion in the core practical training course. The trainer or evaluator should sign the appropriate block upon completion of the training and evaluation of the trainee's ability to satisfactorily perform each task. Fully certified Health Physics Technicians and HPT Training Instructors may sign as Trainer/Evaluator.

- The matrix of generic tasks may be updated with task additions or deletions based on the results of periodic facility Job-Task evaluations.

Phase C: Health Physics Technician Facility-Specific Practical Training (Course HP-300)

- There are 25 specific tasks suggested for inclusion in the facility-specific practical training course. The trainer or evaluator should sign the appropriate block upon completion of the training and evaluation of the trainee's ability to satisfactorily perform each task. Fully certified Health Physics Technicians and Health Physics Technician Training Instructors may sign as Trainer or Evaluator.

- The matrix of facility-specific tasks may be updated with task additions or deletions based on the results of periodic facility Job-Task evaluations.

Upon completion of all certification requirements for Health Physics Technician, final certification is verified by signatures of the trainee and the Facility Training Supervisor. Facility supervisory recommendation of the trainee for this position and verification that experience requirements are met is by the signature of the Health Physics Supervisor. Approval of the trainee's successful completion of all requirements of the Health Physics Technician Training Program is acknowledged by signature of the LLW Disposal Facility Manager. The completed Certification Record is maintained by the Facility Training Supervisor as an official training record and is subject to the record keeping requirements as set forth in Section B-1.6 of this appendix as well as those of the parent company quality assurance and human resources programs.

Phase A—Health Physics Technician Training Program Academics Training Certification Record (HP-100).[a]

Academic Training Lesson Course HP-100	Evaluation grade	Trainer/evaluator signature	Date
HP-101 Basic mathematics and algebra			
HP-102 Unit analysis and conversion			
HP-103 Physical science fundamentals			
HP-104 Nuclear physics fundamentals			
HP-105 Sources of radiation			
HP-106 Radioactivity and radioactive decay			
HP-107 Interactions of radiation with matter			
HP-108 Biological effects of radiation			
HP-109 Radiological protection standards			
HP-110 ALARA			
HP-111 External exposure control			
HP-112 Internal exposure control			
HP-113 Radiation detector theory			
HP-100 Academics Comprehensive Final Examination			

a. The items listed in the academic training lesson column are intended as a guide for the development of a facility-specific program and can be modified.

Phase B—Health Physics Technician Training Program Core Practical Training Certification Record (HP-200).[a]

Core Practical Training Course HP-200		Evaluation grade	Trainer/evaluator signature	Date
HP-201	Complete a performance test on portable radiation instruments			
HP-202	Complete a performance test on health physics counting equipment			
HP-203	Perform a contamination survey			
HP-204	Perform a radiation survey			
HP-205	Obtain and count air samples			
HP-206	Perform leak test on a radioactive source			
HP-207	Post a radiological area to reflect associated hazards			
HP-208	Perform a radioactive material shipment survey			
HP-209	Respond to a high airborne activity alarm			
HP-210	Respond to an uncontrolled release of radioactive material			
HP-211	Respond to an area high radiation alarm			
HP-212	Respond to injured person in a radiologically controlled area			
HP-213	Direct and monitor personnel decontamination			
HP-214	Perform computations on total curies of radwaste received			
HP-215	Don and remove protective respiratory equipment			
HP-216	Don and remove protective clothing			
HP-217	Correct for counting errors			
HP-218	Explain the method of operation of each type of dosimetry			
HP-219	Discuss and complete a Radiation Work Permit			
HP-220	Explain maintaining coverage in a radiologically controlled area			

a. The items listed in the core practical training column are intended as a guide for the development of a facility-specific program and can be modified.

Phase B—Health Physics Technician Training Program Core Practical Training Certification Record (continued).[a]

Core Practical Training Course HP-100	Evaluation grade	Trainer/evaluator signature	Date
HP-221 Use proper methods of personnel decontamination			
HP-222 Describe instruments used for radiation surveys			
HP-223 Describe radiation detector principles of operation			
HP-224 Describe instruments used to monitor contamination			
HP-225 Describe equipment available for air sampling operations			
HP-226 Describe operation of the counting room instruments			

a. The items listed in the core practical training column are intended as a guide for the development of a facility-specific program and can be modified.

Phase C—Health Physics Technician Training Program Facility-Specific Practical Training Certification Record (HP-300).[a]

Facility-Specific Practical Training Course HP-300	Evaluation grade	Trainer/evaluator signature	Date
HP-301 Use facility/federal radiological protection standards			
HP-302 Explain ALARA and the methods used for implementation			
HP-303 Discuss radiological considerations for first aid			
HP-304 Explain how Health Physics documents its work			
HP-305 Use onsite and offsite communications systems			
HP-306 Identify the major methods of contamination control			
HP-307 Discuss the airborne radioactivity control program			
HP-308 Discuss the facility respiratory protection plan			
HP-309 Discuss the procedure for using and storing radioactive sources			
HP-310 Discuss the facility environmental monitoring program			
HP-311 Direct shipment/receipt of radioactive materials			
HP-312 Explain facility/Health Physics response to incident/emergency			
HP-313 29 CFR 1910 - Emergency response to spill of toxic material			
HP-314 29 CFR 1910 - Personnel responsible for facility safety			
HP-315 29 CFR 1910 - Awareness of facility safety hazards			
HP-316 29 CFR 1910 - Use of PPE			
HP-317 29 CFR 1910 - Work practices to minimize risk			
HP-318 29 CFR 1910 - Engineering controls			
HP-319 29 CFR 1910 - Symptoms of exposure			
HP-320 29 CFR 1910 - Managing hazardous waste operations			

a. The items listed in the facility-specific practical training column are intended as a guide for the development of a facility-specific program and can be modified.

Note: ALARA-as low as reasonably achievable
PPE-personal protective equipment

Phase C—Health Physics Technician Training Program Facility-Specific Practical Training Certification Record (continued).[a]

Facility-Specific Practical Training Course HP-300	Evaluation grade	Trainer/evaluator signature	Date
HP-321 29 CFR 1910 - Procedure for handling facility emergencies			
HP-322 29 CFR 1910 - Methods of detecting hazardous materials			
HP-323 29 CFR 1910 - Hazards associated with chemicals used at facility			
HP-324 29 CFR 1910 - Measures employees can use to protect themselves			
HP-325 29 CFR 1910 - Details of Hazard Communication Program			

a. The items listed in the facility-specific practical training column are intended as a guide for the development of a facility-specific program and can be modified.

Health Physics Technician Certification Signature Record

I hereby verify through the review of this Certification Record that I have completed all documented academic training, core, and facility-specific practical training requirements and request my Certification as a Health Physics Technician. To the best of my knowledge, I have no physical or mental disabilities that preclude me from performing the tasks required of this position.

_____ _____

Health Physics Technician Trainee Date

I hereby verify that all required academic training, core, and facility-specific practical training for the above named trainee has been satisfactorily completed for the position of Health Physics Technician. Facility training records indicate this trainee has attended all training sessions and satisfactorily passed all examinations and JPM evaluations as documented in this Certification Record.

_____ _____

Facility Training Supervisor or designee Date

I have reviewed this Certification Record and certify the trainee is capable of safely performing all facility required tasks of a Health Physics Technician. Facility records indicate this trainee meets all the experience requirements of Section B-1.3 of Appendix B. Documentation for any applicable experience outside this facility is attached.

_____ _____

Health Physics Supervisor or designee Date

I have reviewed this Certification Record and hereby certify this trainee as a Health Physics Technician at this facility.

_____ _____

LLW Disposal Facility Manager or designee Date

Appendix B

Attachment 3

Health Physics Technician Lesson Outlines

NOTE: When compared to the relative risk to the public health and safety from a LLW disposal facility, the detail included in these outlines may appear to be more than necessary for many operations. The training program developer is cautioned to carefully select what is necessary to meet the facility's specific needs. In some cases, individuals responsible for training may want to instruct from these outlines. In others, it may be more appropriate to develop the outlines into self-study materials. Some facilities may also choose to provide the outlines to outside vendors or educational institutions to develop training for the facility's employees.

Facility Name Lesson Outline HP-101

Program: HP — Health Physics Technician

Phase: A — Academic Training

Course: HP-100

Lesson Outline: HP-101 — Basic mathematics and algebra

Lesson Topics:

- Add and subtract assigned numbers
- Multiply and divide assigned numbers
- Convert between numbers expressed in standard form and in scientific notation
- Multiply and divide numbers with exponents without the use of a calculator
- Solve algebraic equations for a single variable
- Substitute constants into algebraic equations and solve
- Solve equations using common and/or natural logarithms

Facility Name Lesson Outline HP-102

Program: HP — Health Physics Technician

Phase: A — Academic Training

Course: HP-100

Lesson Outline: HP-102 — Unit analysis and conversion

Lesson Topics:

- State the commonly used systems of measurement and the base units for mass, length, and time in each system

- State the values and abbreviations for the following metric prefixes:

  - mega-
  - kilo-
  - centi-
  - milli-
  - micro-
  - nano-
  - pico-

- Given a measurement and the appropriate conversion factor(s) or conversion factor table, convert the measurement to the specified units

- Using the formula provided, convert a given temperature measurement to specified units

Facility Name Lesson Outline HP-103

Program: HP — Health Physics Technician

Phase: A — Academic Training

Course: HP-100

Lesson Outline: HP-103 — Physical science fundamentals

Lesson Topics:

- Define the terms as they relate to physics:
  - Work
  - Force
  - Energy
- Identify and describe three forms of energy
- State the Law of Conservation of Energy
- Describe the basic structure of the atom, including subatomic particles
- Define the following terms:
  - Atomic number
  - Mass number
  - Atomic mass
- Describe what each of the terms refers to when listing an element in the $_{Z}X^{A}$ format
- Describe the arrangement of the elements in the Periodic Table
- Describe the layout of the Periodic Table by identifying periods and groups
- Define the terms as they relate to atomic structure:
  - Valence shell
  - Valence electron
- Describe each physical state in terms of shape and volume
  - Gas
  - Liquid
  - Solid

Facility Name Lesson Outline HP-104

Program: HP — Health Physics Technician

Phase: A — Academic Training

Course: HP-100

Lesson Outline: HP-104 — Nuclear physics fundamentals

Lesson Topics:

- Define the following terms:

  - Isotope
  - Binding energy
  - Mass defect
  - Nucleon
  - Nuclide

- Describe the mass-energy equivalence concept

- Define the following terms:

  - Fission
  - Fusion
  - Criticality

Facility Name Lesson Outline HP-105

Program: HP — Health Physics Technician

Phase: A — Academic Training

Course: HP-100

Lesson Outline: HP-105 — Sources of radiation

Lesson Topics:

- Identify the following four sources of natural background radiation including the origin, radionuclides, variables, and contribution to exposure:

  - Terrestrial
  - Cosmic
  - Internal emitters
  - Inhaled radionuclides

- Identify the following sources of artificially produced radiation and the magnitude of dose received from each:

  - Nuclear fallout
  - Medical exposures
  - Consumer products
  - Nuclear facilities

Facility Name Lesson Outline HP-106

Program: HP — Health Physics Technician

Phase: A — Academic Training

Course: HP-100

Lesson Outline: HP-106 — Radioactivity and radioactive decay

Lesson Topics:

- Describe how the neutron/proton population is related to nuclear stability
- Define radioactivity
- Identify the difference between natural and artificial radioactivity
- Identify the three major types of radioactive emissions and describe the characteristics of each
- Write simple equations describing the alpha, beta, and positron modes of decay
- State the two aspects associated with the decay of a radioactive nuclide
- List the three naturally occurring radioactive families and identify the end result of each
- Explain why fission products are unstable
- Define the Curie, its subunits, and convert:
  - Curie prefixes
  - Curies to disintegrations per minute
  - Disintegrations per minute to curies
- Define specific activity
- Define half-life
- Calculate activity using the decay formula

Facility Name Lesson Outline HP-106 (continued)

Program: HP — Health Physics Technician

Phase: A — Academic Training

Course: HP-100

Lesson Outline: HP-106 — Radioactivity and radioactive decay (continued)

Lesson Topics:

- Define the following terms:

  - Roentgen
  - RAD/Gray
  - rem/Sievert
  - Quality Factor

- Given the Chart of Nuclides, trace the decay of a radioactive nuclide and identify the stable end product

Facility Name Lesson Outline HP-107

Program: HP — Health Physics Technician

Phase: A — Academic Training

Course: HP-100

Lesson Outline: HP-107 — Interactions of radiation with matter

Lesson Topics:

- Define ionization, excitation, and bremsstrahlung
- Define specific ionization and linear energy transfer (LET)
- Describe the two major mechanisms of energy transfer for alpha particles
- Describe the three major mechanisms of energy transfer for beta radiation
- Describe the three major mechanisms by which gamma photons interact with matter
- List the main categories of neutrons as they are classified by kinetic energy
- Identify three possible results of neutron capture for slow neutrons
- Describe elastic and inelastic scattering interactions for fast neutrons
- Identify the materials best suited to shield alpha, beta, gamma, and neutron radiations
- State the density-thickness values, in milligrams per square centimeters mg/cm^2, for the outer layer of dead skin, lens of the eye, and skin on the whole body

Facility Name Lesson Outline HP-108

Program: HP — Health Physics Technician

Phase: A — Academic Training

Course: HP-100

Lesson Outline: HP-108 — Biological effects of radiation

Lesson Topics:

- Identify the function of and how radiation affects the following structures of the cell:

  - Cell membrane
  - Cytoplasm (Mitochondria, Lysosome)
  - Nucleus (DNA/Chromosomes)

- Describe the direct and indirect effects radiation has on cells

- Define radiosensitivity and list factors affecting the radiosensitivity of cells

- State the law of Bergonie and Tribondeau

- Given a list of types of cells, determine which are most or least radiosensitive

- Describe the LD 50/30 concept and its value for humans

- List and describe the three stages of acute radiation syndrome including the exposure levels and the symptoms associated with each

- Define the following terms as they relate to the biological effects of radiation:

  - Stochastic
  - Nonstochastic (deterministic)

- List and describe the possible somatic effects of chronic exposure to radiation

- Describe the possible risks of radiation exposure to the developing embryo and fetus

- List and describe potential genetic effects associated with exposure to radiation

Facility Name Lesson Outline HP-109

Program: HP — Health Physics Technician

Phase: A — Academic Training

Course: HP-100

Lesson Outline: HP-109 — Radiological protection standards

Lesson Topics:

- Identify the role of various agencies in developing standards and regulations for radiological control
- Identify the interrelationships among regulations, recommendations, orders, and operational safety requirements
- State the purpose and scope of the facility Radiological Control Manual

Facility Name Lesson Outline HP-110

Program: HP — Health Physics Technician

Phase: A — Academic Training

Course: HP-100

Lesson Outline: HP-110 — ALARA

Lesson Topics:

- State the basis for the current as low as reasonably achievable (ALARA) recommendations
- Describe the ALARA philosophy for collective personnel exposure versus individual exposure
- Explain, in terms of external and internal exposure reduction, the scope of an effective ALARA program
- List two examples of ALARA concerns evaluated during design and construction of a storage facility
- State the purposes of prejob ALARA review
- State the purposes of the post-job ALARA review
- Discuss the basic protective measures of time, distance, and shielding
- Identify and discuss specific methods for reducing your personal internal and external radiation doses

Facility Name Lesson Outline HP-111

Program: HP — Health Physics Technician

Phase: A — Academic Training

Course: HP-100

Lesson Outline: HP-111 — External exposure control

Lesson Topics:

- List the four basic methods for minimizing personnel external exposure
- Using the Exposure Rate = 6CEN equation, calculate the gamma exposure rate for specific radionuclides
- Describe the source reduction techniques for minimizing personnel external exposures
- Describe the time-saving techniques for minimizing personnel external exposures
- Using the stay time equation, calculate an individual's remaining allowable dose equivalent or stay time
- Describe the distance to radiation sources techniques for minimizing personnel external exposures
- Using the point source equation (inverse square law), calculate the exposure rate or distance for a point source or radiation
- Using the line source equation, calculate the exposure rate or distance for a line source of radiation
- Describe how exposure rate varies depending on the distance from a surface (plane) source of radiation
- Calculate shielding thickness or exposure rates for gamma and x-ray radiation using the equations for half and tenth thickness values

Facility Name Lesson Outline HP-112

Program: HP — Health Physics Technician

Phase: A — Academic Training

Course: HP-100

Lesson Outline: HP-112 — Internal exposure control

Lesson Topics:

- State four ways in which radioactive materials can enter the body
- Given a pathway for radioactive materials into the body, state and explain one method to prevent or minimize entry by that pathway
- Define the term Annual Limit on Intake (ALI)
- Define the term Derived Air Concentration (DAC)
- Explain how DACs are related to ALIs
- Explain how an ALI is determined
- Define reference man and explain how reference man is used in internal dosimetry
- State and explain one way of using DACs to minimize internal exposure potential
- State and explain three factors that govern the behavior of radioactive material in the body
- State and explain the two natural mechanisms that reduce the quantity of a radionuclide in the body
- Define physical and biological half lives
- State any relationship between the physical, biological, and effective half lives
- Given the physical and biological half lives, calculate the effective half life
- Given a method used by medical personnel to increase the elimination rate of radioactive materials from the body, explain how and why that method works

Facility Name Lesson Outline HP-113

Program: HP — Health Physics Technician

Phase: A — Academic Training

Course: HP-100

Lesson Outline: HP-113 — Radiation detector theory

Lesson Topics:

- Identify the three fundamental laws associated with electrical charges
- Define current, voltage, and resistance as units of measurement
- Explain the function of the detector and readout circuitry components in a radiation measurement system
- Identify the parameters that affect the number of ion pairs collected in a gas-filled detector
- Draw and label the six-region curve for gas-filled detectors
- Describe the characteristics of a detector operated in each of the useful regions
- Define the following terms:
  - Resolving time
  - Dead time
  - Recovery time
- Describe the methods employed with gas-filled detectors to discriminate between various types of radiation and various radiation energies
- Describe how a scintillation detector and associated components operate to measure radiation
- Explain how neutron detectors detect neutrons and provide an electrical signal
- Identify the principles of detection and advantages and disadvantages of a germanium lithium detector and a hyperpure germanium detector
- Identify the principles of detection, advantages and disadvantages of semi-conductor alpha detectors

Facility Name Lesson Outline HP-201

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-201 — Complete a performance test on portable radiation instruments

Lesson Topics:

- Locate the applicable reference/operating procedure
- State whether the instrument is a count rate or dose rate instrument
- State the documentation required for performance testing of portable radiological instruments
- State which isotopes are used to source check beta/gamma count rate instruments, alpha count rate instruments, and dose rate instruments
- Discuss how to determine the proper source to use for source checks
- Discuss how each instrument is positioned on the source for source checks
- Discuss as low as reasonably achievable concerns encountered during source checking portable dose rate instruments
- Discuss the documentation of source check results
- Discuss operational checks completed during a performance test of portable radiological instruments

Facility Name Lesson Outline HP-202

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-202 — Complete a performance test on health physics counting equipment

Lesson Topics:

- Locate the applicable reference/operating procedure
- State the required equipment needed to complete the performance test
- Explain the types of tests performed
- State the required frequencies of performance tests
- Explain the preoperational checks performed before the tests
- Explain the purpose of the Chi-squared test and interpret test results
- Explain the efficiency test and interpret results
- Explain the documentation requirements for counting equipment performance testing

Facility Name Lesson Outline HP-203

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-203 — Perform a contamination survey

Lesson Topics:

- Locate the applicable reference/operating procedure
- State the required equipment for conducting a contamination survey
- State when detailed removable contamination surveys are required
- State the size of area to smear, and the smear media used, when performing a detailed removable contamination survey
- State how the results are recorded when performing a detailed removable contamination survey
- Explain how to differentiate between fixed and removable contamination
- Explain how to conduct a direct scan survey for both beta/gamma and alpha contamination
- Explain how to covert from counts per minute (cpm) to disintegrations per minute (dpm) for the instruments used in the survey
- State the contamination limit for contamination control areas
- State actions taken in the event of detectable contamination in excess of expected or allowable limits

Facility Name Lesson Outline HP-204

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-204 — Perform a radiation survey

Lesson Topics:

- Locate the applicable reference/operating procedure
- Describe the appropriate instruments for surveying a radiation area
- Explain the additional documentation used as background information for the area to be surveyed
- State the different types of radiation that may be detected by each instrument used in the survey
- Define body field, contact dose rate, hot spot, and streaming radiation
- State how beta and gamma dose rates are normally obtained when using an ion-chamber survey instrument (RO-2 or equivalent)
- State how beta and gamma dose rates are calculated and reported at the facility
- Explain how to measure personnel dose rates with an ion-chamber instrument in areas where low energy photons represent a significant portion of the radiation field
- Explain actions to be taken if abnormal conditions are encountered

Facility Name Lesson Outline HP-205

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-205 — Obtain and count air samples

Lesson Topics:

- Locate the applicable reference/operating procedure
- State the types of assemblies and filter media available for use at the facility and the purpose of each
- State the types of airborne contaminants that may be sampled and the methods for collection and counting
- Identify major components and controls of each air sampler
- Discuss the operation of each type of air sampler
- List and explain the conditions that indicate when an air sample should be taken
- Describe how to take an air sample
- List the minimum volume of air to be sampled for each type of sample
- Discuss procedure for air sampler exhaust
- Calculate an air activity concentration given the necessary information
- List facility-specific limiting isotopes and the air concentrations of each requiring respiratory protection
- Determine Radon/Thoron activity caused by a temperature inversion
- Determine the Minimum Detectable Activity of an air sample
- State actions taken in the event of detected airborne contamination in excess of expected or allowable limits

Facility Name Lesson Outline HP-206

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-206 — Perform leak test on a radioactive source

Lesson Topics:

- Locate the procedure for completing this task
- State the required equipment for performing this task
- Discuss the safety precautions used when performing this task
- State the requirements for the source to be considered satisfactory (not leaking)
- Explain the discrepancies that may be encountered during the inspection
- State the documentation requirements

Facility Name Lesson Outline HP-207

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-207 — Post a radiological area to reflect associated hazards

Lesson Topics:

- Locate the applicable reference procedure
- State the equipment required and storage locations
- Discuss facility-specific radiological posting requirements (e.g., update, types, limits)
- Explain the documentation requirements

Facility Name Lesson Outline HP-208

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-208 — Perform a radioactive material shipment survey

Lesson Topics:

- Locate and discuss the procedures used for shipping and receiving radioactive material
- Explain the appropriate equipment for shipment surveys
- Discuss the different types of packaging and the limits associated with each
- State the survey requirements and necessary documentation required for each type of packaging
- Define Transportation Index and explain how it is determined and documented
- Define Exclusive Use and explain how it is used when shipping radioactive material
- Explain the labeling required for shipping radioactive material (i.e., White I, Yellow II, Yellow III, low specific activity)

Facility Name Lesson Outline HP-209

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-209 — Respond to a high airborne activity alarm (e.g., continuous air monitor alarm)

Lesson Topics:

- Locate the applicable reference/procedure
- State the initial response actions for continuous air monitor (CAM) alarms
- State the three checks performed for proper operation of a CAM
- Discuss personal protective equipment used in responding to a CAM alarm
- Discuss the reasons for CAM surveillances during periods of Radon buildup
- Discuss setpoint calculations and changes in setpoints

Facility Name Lesson Outline HP-210

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-210 — Respond to an uncontrolled release of a radioactive material (e.g., radioactive spill, stack alarm)

Lesson Topics:

- State the applicable reference/procedure
- State the immediate actions required for a spill
- List the items required to respond to a radioactive spill
- List the primary precautions an Health Physics Technician must follow when responding to a radioactive spill
- Discuss how the immediate actions differ when the spill involves material that could become critical
- Discuss how the immediate actions differ when the spill involves dry radioactive material

Facility Name Lesson Outline HP-211

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-211 — Respond to an area high radiation alarm (e.g., remote area monitor, area radiation monitor)

Lesson Topics:

- State the purpose of the area radiation monitor alarms
- State the locations for the area radiation monitor alarms at the facility
- Locate and discuss the procedure for responding to an area radiation monitor alarm
- Discuss the safety precautions required when responding to an area radiation monitor alarm

Facility Name Lesson Outline HP-212

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-212 — Respond to an injured person in a radiologically controlled area

Lesson Topics:

- List and explain all initial actions to be taken for an injured person in a radiologically controlled area
- State the item of primary concern when an injury occurs in a radiologically controlled area
- State the factors that affect the decision to move an injured person in a radiologically controlled area
- List the practices to follow when removing a worker that has sustained a minor injury while working in a radiologically controlled area
- State the factors that affect the decision for exposing rescue personnel

Facility Name Lesson Outline HP-213

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-213 — Direct and monitor personnel decontamination

Lesson Topics:

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

Facility Name Lesson Outline HP-214

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-214 — Perform computations on total curies of radwaste received

Lesson Topics:

- Locate and discuss the operation of the computer storing information on waste receipts
- Explain how to startup and shutdown this computer
- Discuss the administrative limitations on data entry on waste receipts and data retrieval for the monthly report
- State the steps involved in data entry into the radioactive waste receipt data base program
- State the steps involved in data retrieval from the radioactive waste receipt data base program
- Interpret the radioactive waste receipt data base program as to the types and amounts (curies) of radioactive material
- Explain the administrative path for review of the radioactive waste receipt data base program

Facility Name Lesson Outline HP-215

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-215 — Don and remove protective respiratory equipment

Lesson Topics:

- Explain the purpose of respiratory protection standards and regulations
- Discuss facility controls to ensure only qualified personnel use respiratory equipment
- Identify the training, fitting, and medical qualifications required for use of respiratory equipment
- Identify the types of respiratory equipment available and the specific conditions requiring the use of each
- Discuss how to use a Radiation Work Permit to determine respiratory equipment requirements
- Discuss the safety checks required before use of respiratory equipment
- Demonstrate how to properly don all types of facility respiratory equipment
- Demonstrate how to properly remove all types of facility respiratory equipment
- Discuss the minimum specifications for the breathing air used in forced-fed respiratory equipment

Facility Name Lesson Outline HP-216

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-216 — Don and remove protective clothing

Lesson Topics:

- Explain the purpose of personnel contamination control standards and regulations
- State the purpose of using protective clothing in contamination areas
- Discuss facility controls to ensure only qualified personnel use protective clothing
- Identify the training and qualifications required for use of protective clothing
- Identify the types of protective clothing available and the specific conditions requiring the use of each
- Discuss how to use a Radiation Work Permit to determine protective clothing requirements
- List the three basic factors that determine protective clothing requirements for personnel protection
- Given contamination survey information on a specific job, select the proper type of protective clothing required
- Discuss the checks required before use of protective clothing
- Demonstrate how to properly don all types of facility protective clothing
- Demonstrate how to properly remove all types of facility protective clothing
- Discuss the required actions for torn or damaged protective clothing while in a radiologically controlled area

Facility Name Lesson Outline HP-217

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-217 — Correct for counting errors

Lesson Topics:

- Identify the five general types of radiation measurement errors
- Describe the effect of each source of error on radiation measurements
- State the two purposes for statistical analysis of count room operations
- Define the terms mean, median and mode
- Given a series of data, calculate mean, median or mode
- Define the terms variance and standard deviation
- Given the formula and required information, calculate the standard deviation
- Explain how a Chi-square value is used in analysis of count room measurements
- Perform Chi-square analysis on given count room data
- Explain the meaning of counting data reported as x.xx ± yy disintegrations per minute
- Given the counting results and appropriate formulas, report results to desired confidence level
- List and explain the methods used to improve the statistical validity of count room measurements
- Given counting and source data, calculate efficiencies and correction factors

Facility Name Lesson Outline HP-218

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-218 — Explain the method of operation for each type of dosimetry

Lesson Topics:

- State the purpose of each type of personnel dosimetry used at the facility
- Discuss the correct use of each type of personnel dosimetry used at the facility
- Describe the specific conditions and requirements for use of each type of dosimetry used at the facility
- Discuss how to use a Radiation Work Permit to determine personnel dosimetry requirements
- Describe the theory of operation of a thermoluminescent dosimeter (TLD)
- Describe the theory of operation of a beta-gamma TLD
- Describe the theory of operation of a neutron TLD
- Discuss the advantages and disadvantages of TLDs
- Describe how a TLD reader measures the radiation dose from a TLD
- Describe the theory of operation of a self-reading dosimeter
- Describe the theory of operation of an alarming dosimeter

Facility Name Lesson Outline HP-219

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-219 — Discuss and complete a Radiation Work Permit

Lesson Topics:

- State the purpose of and the information found on a Radiation Work Permit (RWP)
- State the responsibilities in using or initiating an RWP
- Discuss the types of facility work activities that must be controlled by a RWP
- Describe the facility areas that require a RWP before entry
- List and explain the different types of RWPs used at the facility
- Discuss the requirements for use of a job-specific RWP
- Discuss the posting requirements for RWPs
- Discuss the worker responsibilities regarding RWPs
- Describe the radiation, contamination, and air sample survey requirements for completing an RWP
- Given a specific set of conditions and a job, complete an RWP for the task
- List the review/approval requirements for RWPs

Facility Name Lesson Outline HP-220

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-220 — Explain maintaining coverage in a radiologically controlled area

Lesson Topics:

- List three purposes of job coverage
- Explain the difference between continuous and intermittent job coverage
- Given example conditions, identify those that should require job coverage
- Identify items that should be considered in preplanning job coverage
- Identify examples of information that should be discussed with workers during prejob briefings
- Describe exposure control techniques that can be used to control worker and technician radiation exposures
- Describe the in-progress radiological surveys that should be performed under various radiological conditions
- Describe the facility requirements for documentation of in-progress radiological surveys
- Explain actions that should be taken if surveys show radiological conditions significantly different from those expected
- Describe contamination control techniques that can be used to limit or prevent personnel and area contamination and/or reduce radioactive waste generation

Facility Name Lesson Outline HP-220 (continued)

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-220 — Explain maintaining coverage in a radiologically controlled area (continued)

Lesson Topics:

- Describe job coverage techniques that can be used to prevent or limit the spread of airborne radioactive material
- Describe overall job control techniques in maintaining control of radiological work
- State the reasons to stop radiological work activities in accordance with the facility Radiological Control Manual

Facility Name Lesson Outline HP-221

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-221 — Use proper methods of personnel decontamination

Lesson Topics:

- Locate the applicable reference/procedure for personnel decontamination
- Discuss the responsibilities of the contaminated individual
- Explain the survey techniques for determination of the extent and type of contamination
- Discuss the various methods of skin decontamination including special requirements
- Discuss intrusive skin decontamination methods including required support for this method
- List the requirements for a dose assessment based on levels of skin contamination
- Explain the reportability requirements for skin contamination and dose assessment results to the individual, facility management, and to outside agencies
- Discuss the priorities involving contamination versus injured personnel
- Explain the special problems with internal contamination due to ingestion/breathing of radioactive material

Facility Name Lesson Outline HP-222

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-222 — Describe the instruments used for radiation surveys

Lesson Topics:

- List the factors that determine the selection of a portable radiation survey instrument
- Identify the following features and specification for ion chambers used at this facility:
  - Detector type
  - Instrument operating ranges
  - Detector shielding and window
  - Types of radiation detected/measured
  - Operator-adjustable controls
  - Markings for detector effective center
  - Specific limitations/characteristics
- Identify the following features and specifications for the extendable Geiger-Mueller instruments as this facility:
  - Detector type
  - Instrument operating ranges
  - Detector shielding and window
  - Types of radiation detected/measured
  - Operator-adjustable controls
  - Markings for detector effective center
  - Specific limitations/characteristics
- Identify the following features and specifications for high range ion chamber instruments used at this facility:
  - Instrument operating ranges
  - Detector shielding and window
  - Types of radiation detected/measured
  - Operator-adjustable controls
  - Markings for detector effective center
  - Specific limitations/characteristics

Facility Name Lesson Outline HP-222 (continued)

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-222 — Describe the instruments used for radiation surveys (continued)

Lesson Topics:

- Identify the following features and specifications for neutron detection and measurement instruments at this facility:

  - Instrument operating ranges
  - Detector shielding and window
  - Types of radiation detected/measured
  - Operator-adjustable controls
  - Markings for detector effective center
  - Specific limitations/characteristics

Facility Name Lesson Outline HP-223

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-223 — Describe radiation detector principles of operation

Lesson Topics:

- List all radiation detection and measurement instruments in use at this facility and the detector type in each

- Describe the theory of operation for each of the following types of detectors:

  - Geiger-Mueller tube
  - Ionization chamber
  - Scintillation detector
  - Fission chamber
  - Proportional counter
  - Boron trifluoride

Facility Name Lesson Outline HP-224

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-224 — Describe the instruments used to monitor contamination

Lesson Topics:

- List the factors that determine the selection of a portable contamination monitoring instrument

- Describe the following features and specifications for commonly used count rate meter probes for beta/gamma and/or alpha surveys at this facility:

  - Detector type
  - Detector shielding and window
  - Types of radiation detected/measured
  - Energy response for measured radiation
  - Specific limitations/characteristics

- Describe the following features and specifications for commonly used count rate instruments at this facility:

  - Types of detectors available for use
  - Operator-adjustable controls
  - Specific limitations/characteristics

- Describe the following features and specifications for commonly used personnel contamination monitors at this facility:

  - Detector type
  - Detector shielding and window
  - Types of radiation detected/measured
  - Energy response for measured radiation
  - Operator-adjustable controls
  - Specific limitations/characteristics

Facility Name Lesson Outline HP-224 (continued)

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-224 — Describe the instruments used to monitor contamination (continued)

Lesson Topics:

- Describe the following features and specifications for commonly used contamination monitors (e.g., tool, bag, and laundry monitors) at this facility:

  - Detector type
  - Detector shielding and window
  - Types of radiation detected/measured
  - Energy response for measured radiation
  - Specific limitations/characteristics

Facility Name Lesson Outline HP-225

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-225 — Describe the equipment available for air sampling operations

Lesson Topics:

- List the factors that determine the selection of a portable air sampler
- Identify the physical and operating characteristics and the limitations of the Staplex and Radeco portable air samplers
- Identify the physical and operating characteristics and the limitation(s) of motor air pumps
- List the steps for a preoperational checkout of a portable air sampler
- Identify the physical and operating characteristics and the limitation(s) of beta-gamma constant air monitors (CAM)
- Identify the physical and operating characteristics and the limitation(s) of alpha CAMs

Facility Name Lesson Outline HP-226

Program: HP — Health Physics Technician

Phase: B — Core Practical Training

Course: HP-200

Lesson Outline: HP-226 — Describe the operation of the counting room instruments

Lesson Topics:

- Describe the following features and specifications for commonly used laboratory counter/scalers:

  - Detector type
  - Detector shielding and housing
  - Types of radiation detected/measured
  - Scaler type uses
  - Scaler operator-adjustable controls
  - Specific procedures for source checks
  - Specific procedures for sample counts

- Describe the following features and specifications for low-background automatic counting systems at this facility:

  - Detector type
  - Detector shielding and housing
  - Types of radiation detected/measured
  - Specific procedures for source checks
  - Specific procedures for sample counts

- Describe the following features and specifications for commonly used gamma/alpha spectroscopy systems used at this facility:

  - Detector type
  - Detector shielding and housing
  - Types of radiation detected/measured
  - Specific procedures for source checks
  - Specific procedures for sample counts

Facility Name Lesson Outline HP-301

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-301 — Use facility/federal radiological protection standards

Lesson Topics:

- Identify the federal radiological protection standards and regulations applicable to this facility
- Identify the facility-specific radiological protection standards and regulations
- Describe any differences between the federal and facility-specific radiological protection standards and regulations
- State the purposes of the facility administrative radiation control levels
- Identify the federal radiation dose limits and facility administrative control levels
- State the facility policy concerning prenatal radiation exposure
- Identify the employee's responsibilities concerning radiation dose limits and administrative control levels
- Describe the action to be taken if a worker suspects that dose limits or administrative control levels are being approached or exceeded.

Facility Name Lesson Outline HP-302

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-302 — Explain ALARA and the methods used for implementation

Lesson Topics:

- State the definition for the acronym ALARA
- Discuss the function of the facility ALARA committee
- Discuss the reasons for minimizing/reducing facility personnel radiation exposure
- List the facility personnel who are members of the ALARA committee
- Discuss the means for an individual worker to provide input/recommendations to the ALARA committee
- Discuss items the ALARA committee will use for evaluating the effectiveness of the facility radiological control program and for making changes to the program
- State the specific methods radiation exposures have been/will be minimized at this facility based on ALARA committee recommendations

Facility Name Lesson Outline HP-303

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-303 — Discuss radiological considerations for first aid

Lesson Topics:

- List the proper steps for the treatment of minor injuries occurring in various radiological areas
- List the requirements for responding to major injuries or illnesses in radiological areas
- State the Health Physics Technician's responsibilities at the scene of a major injury in a radiological area after medical personnel have arrived at the scene
- List the requirements for treatment and transport of contaminated injured personnel at this facility
- State the notification requirements for an incident involving contaminated, injured personnel
- List and describe how to contact the emergency and hospital facilities in the area that provide medical support for contaminated, injured personnel from this facility

Facility Name Lesson Outline HP-304

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-304 — Explain how Health Physics documents work

Lesson Topics:

- List the types of records/reports that the Health Physics Department is responsible for maintaining at this facility

- Explain the requirements for the records management system, such as Quality Control/Quality Assurance, auditability/retrievability, and management information at this facility

- Describe the types of records and reports used by the Health Physics Department at this facility, including but not limited to:

  - Radiation Work Permits
  - Survey reports
  - Analysis reports
  - Radiological deficiency reports
  - As low as reasonably achievable documentation
  - Exposure reports
  - Health Physics operating procedures
  - Health Physics emergency/abnormal procedures

Facility Name Lesson Outline HP-305

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-305 — Use onsite and offsite communications systems

Lesson Topics:

- Explain the importance of onsite and offsite communications systems (normal and emergency)
- Describe the types of communications systems and equipment available at this facility
- Describe the methods of maintaining professional communications when using facility communications systems including use of the phonetic alphabet and repeat backs
- Identify areas of restricted use for each facility communication system and why use is restricted
- Locate and demonstrate the ability to use all facility communications equipment
- Explain how to contact facility key personnel using all applicable communications systems:
  - Shift supervisor
  - Work supervisor
  - Fire/emergency personnel
  - Security personnel
- Explain how to contact key offsite personnel and organizations using all applicable communications systems:
  - Fire/emergency personnel
  - Medical personnel
  - U.S. Nuclear Regulatory Commission
  - U.S. Department of Energy
- Describe the applications for communication systems and equipment to accomplish the following:
  - Direct work activities
  - Perform tests
  - Emergencies

Facility Name Lesson Outline HP-306

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-306 — Identify the major methods of contamination control

Lesson Topics:

- Identify the four phases of a radiological monitoring program for contamination control
- Identify the difference between loose and fixed surface contamination
- Identify the basic goal of a contamination control program
- State three basic principles of contamination control
- Identify the possible methods of containment used for contamination control
- State the purpose of using protective clothing in contamination areas
- List the three basic factors that determine protective clothing requirements for personnel protection
- Given contamination survey information on a specific job, select the proper type of protective clothing for personnel based on the contamination control program at this facility

Facility Name Lesson Outline HP-307

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-307 — Discuss the airborne radioactivity control program

Lesson Topics:

- State the three primary objectives of an airborne radioactivity sampling program
- Describe the three physical states of airborne radioactive contaminants
- List the two primary considerations to ensure a representative air sample is obtained
- Define the term isokinetic sampling as associated with airborne radioactivity sampling
- Identify the six general methods for obtaining samples or measurements of airborne radioactivity concentrations and describe the principle of operation for each method:

  - Filtration
  - Volumetric
  - Impaction/impingement
  - Adsorption
  - Condensation/dehumidification
  - In-line/flow-through detection

- List the factors that affect the accuracy of airborne radioactivity measurements
- State the purpose of the five types of airborne radioactivity samplers/monitors:

  - Personal air samplers (breathing zone)
  - High volume/flow rate air samplers
  - Low volume/flow rate air samplers
  - Movable continuous air monitors
  - Installed continuous air monitoring systems

- Describe the general considerations for selection of an air sampling method

Facility Name Lesson Outline HP-308

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-308 — Discuss the facility respiratory protection plan

Lesson Topics:

- Explain the purpose of respiratory protection standards and regulations
- Identify the Occupational Safety and Health Administration, American National Standards Institute, and facility respiratory protection program requirements
- Identify the standards that regulate respiratory protection
- Describe the advantages and disadvantages (limitations) of each of the following respirators:
  - Air purifying, particulate removing filter respirators
  - Air purifying, chemical cartridge and canister respirators for gases and vapors
  - Full-face, supplied-air respirators
  - Self-contained breathing apparatus
  - Combination atmosphere supplying respirators
- Define the term protection factor
- State the difference between a qualitative and quantitative fit test
- State the recommended physical functions the subject must perform during a respirator fit test
- State how the term protection factor is applied to the selection of respiratory protection equipment
- State the general and hazard specific considerations when selecting the proper respiratory protection equipment
- Identify the types of respiratory equipment available at this facility
- Identify the quality specification breathing air must meet

Facility Name Lesson Outline HP-309

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-309 — Discuss the procedure for using and storing radioactive sources

Lesson Topics:

- Describe the requirements for radioactive sources as described in the facility Radiological Control Manual
- Identify the packaging, marking and labeling requirements for radioactive sources at this facility
- Identify the radioactive sources that must be controlled at this facility
- Describe the approval and posting requirements for radioactive materials storage areas at this facility
- Describe the procedures used at this facility for storage and accountability of radioactive sources

Facility Name Lesson Outline HP-310

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-310 — Discuss the facility environmental monitoring program

Lesson Topics:

- State the goals of an environmental monitoring program
- State the exposure limits to the general public as they apply to environmental monitoring
- Define the term critical pathway
- Define the term critical nuclide
- State locations frequently surveyed for radiological contamination at outdoor waste sites associated with this facility and the reasons for each
- Define the term suspect waste site
- Describe the methods used for environmental monitoring at this facility

Facility Name Lesson Outline HP-311

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-311 — Direct shipment/receipt of radioactive materials

Lesson Topics:

- List the applicable agencies that have regulations governing the transport of radioactive material

- Define the following terms used in Department of Transportation regulations:
  - Low specific activity
  - Limited quantity
  - Transport index
  - Exclusive use
  - Closed transport vehicle

- List methods that may be used to determine the radionuclide contents of a package

- Describe the radiation and contamination surveys required for packages and state the applicable limits

- Describe the radiation and contamination surveys required for exclusive use vehicles and state the applicable limits

- Identify the proper placement of placards on a transport vehicle

- Identify inspection criteria that should be checked prior to releasing a shipment at your facility

- Describe facility procedures for receipt and shipment of radioactive material shipments

- List the actions required at this facility if a shipment is received exceeding radiation or contamination limits

- Describe the proper step-by-step method for opening a package containing radioactive material at your facility

Facility Name Lesson Outline HP-312

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-312 — Explain facility/Health Physics response to an incident/emergency

Lesson Topics:

- Describe the Health Physics (HP) response to a CAM alarm
- Describe the HP response to a personnel contamination monitor alarm
- Describe the HP response to off-scale or lost dosimetry
- Describe the HP response to rapidly increasing, unanticipated radiation levels or an area radiation monitor alarm
- Describe the HP response to a dry or liquid radioactive material spill
- Describe the HP response to a fire in a radiological area or involving radioactive materials
- Describe the HP response to other specific facility incidents (as applicable)
- Describe the response levels associated with radiological emergencies
- Describe facility-specific procedures for documenting radiological incidents
- Identify the location/contents of emergency equipment kits
- Identify the structure of the emergency response organization at this facility
- Identify the available offsite incident support groups and explain the assistance that each group can provide
- Discuss radiological incidents at this and other facilities, including cause, prevention, and recommended incident response

Facility Name Lesson Outline HP-313

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-313 — 29 CFR 1910.120(B)(4)—Emergency response to spill of toxic material

Lesson Topics:

- Locate and discuss this regulation as found in the Code of Federal Regulations (CFR)
- Discuss how this regulation specifically applies to the operation of this facility
- Identify the specific facility regulation(s) and procedure(s), that implement this 29 CFR 1910 regulation
- Discuss the specific Health Physics Technician responsibilities with regard to this regulation

Facility Name Lesson Outline HP-314

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-314 — 29 CFR 1910.120(e)(1)(i)—Personnel responsible for facility safety

Lesson Topics:

- Locate and discuss this regulation as found in the Code of Federal Regulations (CFR)
- Discuss how this regulation specifically applies to the operation of this facility
- Identify the specific facility regulation(s) and procedure(s) that implement this 29 CFR 1910 regulation
- Discuss the specific Health Physics Technician responsibilities with regard to this regulation

Facility Name Lesson Outline HP-315

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-315 — 29 CFR 1910.120(e)(1)(ii)—Awareness of facility safety hazards

Lesson Topics:

- Locate and discuss this regulation as found in the Code of Federal Regulations (CFR)
- Discuss how this regulation specifically applies to the operation of this facility
- Identify the specific facility regulation(s) and procedure(s) that implement this 29 CFR 1910 regulation
- Discuss the specific Health Physics Technician responsibilities with regard to this regulation

Facility Name Lesson Outline HP-316

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-316 — 29 CFR 1910.120(e)(1)(iii)—Use of personal protective equipment

Lesson Topics:

- Locate and discuss this regulation as found in the Code of Federal Regulations (CFR)
- Discuss how this regulation specifically applies to the operation of this facility
- Identify the specific facility regulation(s) and procedure(s) that implement this 29 CFR 1910 regulation
- Discuss the specific Health Physics Technician responsibilities with regard to this regulation

Facility Name Lesson Outline HP-317

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-317 — 29 CFR 1910.120(e)(1)(iv)—Work practices to minimize risk

Lesson Topics:

- Locate and discuss this regulation as found in the Code of Federal Regulations (CFR)
- Discuss how this regulation specifically applies to the operation of this facility
- Identify the specific facility regulation(s) and procedure(s) that implement this 29 CFR 1910 regulation
- Discuss the specific Health Physics Technician responsibilities with regard to this regulation

Facility Name Lesson Outline HP-318

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-318 — 29 CFR 1910.120(e)(1)(v)—Engineering controls

Lesson Topics:

- Locate and discuss this regulation as found in the Code of Federal Regulations (CFR)
- Discuss how this regulation specifically applies to the operation of this facility
- Identify the specific facility regulation(s) and procedure(s) that implement this 29 CFR 1910 regulation
- Discuss the specific Health Physics Technician responsibilities with regard to this regulation

Facility Name Lesson Outline HP-319

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-319 — 29 CFR 1910.120(e)(1)(vi)—Symptoms of exposure

Lesson Topics:

- Locate and discuss this regulation as found in the Code of Federal Regulations (CFR)
- Discuss how this regulation specifically applies to the operation of this facility
- Identify the specific facility regulation(s) and procedure(s) that implement this 29 CFR 1910 regulation
- Discuss the specific Health Physics Technician responsibilities with regard to this regulation

Facility Name Lesson Outline HP-320

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-320 — 29 CFR 1910.120(e)(3)—Managing hazardous waste operations

Lesson Topics:

- Locate and discuss this regulation as found in the Code of Federal Regulations (CFR)
- Discuss how this regulation specifically applies to the operation of this facility
- Identify the specific facility regulation(s) and procedure(s) that implement this 29 CFR 1910 regulation
- Discuss the specific Health Physics Technician responsibilities with regard to this regulation

Facility Name Lesson Outline HP-321

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-321 — 29 CFR 1910.120(1)(2)(i)—Procedure for handling facility emergency incidents

Lesson Topics:

- Locate and discuss this regulation as found in the Code of Federal Regulations (CFR)
- Discuss how this regulation specifically applies to the operation of this facility
- Identify the specific facility regulation(s) and procedure(s) that implement this 29 CFR 1910 regulation
- Discuss the specific Health Physics Technician responsibilities with regard to this regulation

Facility Name Lesson Outline HP-322

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-322 — 29 CFR 1910.1200(h)(2)(i)—Methods for detecting hazardous materials

Lesson Topics:

- Locate and discuss this regulation as found in the Code of Federal Regulations (CFR)
- Discuss how this regulation specifically applies to the operation of this facility
- Identify the specific facility regulation(s) and procedure(s) that implement this 29 CFR 1910 regulation
- Discuss the specific Health Physics Technician responsibilities with regard to this regulation

Facility Name Lesson Outline HP-323

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-323 — 29 CFR 1910.1200(h)(2)(ii)—Hazards associated with in use facility chemicals

Lesson Topics:

- Locate and discuss this regulation as found in the Code of Federal Regulations (CFR)
- Discuss how this regulation specifically applies to the operation of this facility
- Identify the specific facility regulation(s) and procedure(s) that implement this 29 CFR 1910 regulation
- Discuss the specific Health Physics Technician responsibilities with regard to this regulation

Facility Name Lesson Outline HP-324

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-324 — 29 CFR 1910.1200(h)(2)(iii)—Measures employees can use to protect themselves

Lesson Topics:

- Locate and discuss this regulation as found in the Code of Federal Regulations (CFR)
- Discuss how this regulation specifically applies to the operation of this facility
- Identify the specific facility regulation(s) and procedure(s) that implement this 29 CFR 1910 regulation
- Discuss the specific Health Physics Technician responsibilities with regard to this regulation

Facility Name Lesson Outline HP-325

Program: HP — Health Physics Technician

Phase: C — Facility-Specific Practical Training

Course: HP-300

Lesson Outline: HP-325 — 29 CFR 1910.1200(h)(2)(iv)—Details of Hazard Communications Program including Material Safety Data Sheets.

Lesson Topics:

- Locate and discuss this regulation as found in the Code of Federal Regulations (CFR)
- Discuss how this regulation specifically applies to the operation of this facility
- Identify the specific facility regulation(s) and procedure(s) that implement this 29 CFR 1910 regulation
- Discuss the specific Health Physics Technician responsibilities with regard to this regulation

Appendix C

Facility Supervision Training Program

CONTENTS

C-1 Facility Supervision Training Program C-5

C-1.1 Applicability C-5

C-1.2 Program Entry Requirements C-5

C-1.2.1 Level of Education C-5
C-1.2.2 Experience C-5
C-1.2.3 Physical Attributes C-6

C-1.3 Training Waiver Policy C-6

C-1.3.1 No Previous Experience C-6
C-1.3.2 Experience at Facilities Not Subject to Licensing C-7
C-1.3.3 Experience at Comparable Facilities Subject to Licensing C-7

C-1.4 Position Certification Requirements C-7

C-1.5 Work Without Certification Policy C-8

C-1.6 Records Maintenance C-8

C-1.7 Training Matrix C-9

C-1.8 Continuing Training Program C-9

C-1.9 Training Records C-10

C-1.10 References C-10

Attachment 1 Facility Supervision Training Matrix C-11

Attachment 2 Facility Supervision Certification Record C-19

Attachment 3 Facility Supervision Lesson Outlines C-31

TABLES

1-1. Supervisory Skills Training C-13

1-2. Department Practical Training C-14

1-3. Facility Practical Training C-16

Appendix C

C-1 Facility Supervision Training Program

C-1.1 Applicability

The training program described in this appendix is applicable to the training of Facility Department Supervisors at low-level radioactive waste (LLW) disposal facilities. The individuals successfully participating in and completing this program will be certified as Department Supervisor of their respective department (Maintenance, Operations, Health Physics, etc.) and will be responsible for, but not limited to, the training, certification, and supervision of department personnel; management and oversight of department operations; responding to alarms and emergency situations; and additional duties as applicable.

Facilities may wish to designate individuals as Assistant Department Supervisors who could act for the Department Supervisor when that individual is not available. This person will have the equivalent certification to the Department Supervisor.

In addition, fully certified Department Supervisors/Assistant Department Supervisors will be certified for and act as the facility Shift Managers. The responsibilities of this position are supplementary to those of the Department and Assistant Department Supervisors.

C-1.2 Program Entry Requirements

The requirements for entry into the Facility Supervision Training Program will be determined by the LLW Disposal Facility Manager and the Facility Training Supervisor. Factors that should be used for determining eligibility for this program include:

C-1.2.1 Level of Education

A bachelor of science degree in engineering or equivalent is preferred. A high school diploma (or GED equivalent) or an associates degree in engineering or equivalent as well as appropriate supervisory experience may be substituted.

C-1.2.2 Experience

The following experience level category options are available and may be used:

- Fully certified Department Supervisor at another LLW or commercial nuclear facility (see Section C-1.3)

- Nuclear-trained supervisor (officer or enlisted) in the Navy Nuclear Power Program or a Department Supervisor at a U.S. Government-run nuclear facility (see Section C-1.3)

- Two-year associates degree in engineering or equivalent from an accredited technical school or junior college with no previous supervisory experience

- Two-year associates degree in engineering or equivalent from an accredited technical school or junior college with previous supervisory experience

- Bachelor of science degree in engineering or equivalent from an accredited university with no previous supervisory experience

- Bachelor of science degree in engineering or equivalent from an accredited university with previous supervisory experience.

C-1.2.3 Physical Attributes

Each potential program trainee must meet the following requirements:

- Meets prerequisite conditions of general health as set forth by the facility

- Meets prerequisite conditions for exposure to low levels of radiation

- Has corrected or nonimpaired visual and auditory acuity

- Meets prerequisite criteria for the wearing of respiratory equipment

- Meets facility fitness-for-duty criteria

- Has the physical strength/stamina necessary to perform applicable tasks required of a Department Supervisor/Shift Manager.

C-1.3 Training Waiver Policy

Various combinations of the requirements for completion of the initial certification process may be waived on a case-by-case basis. Actual waiver determinations will be made by the LLW Disposal Facility Manager and the Facility Training Supervisor and will be based on the trainee's previous experience levels. The conditions for waiver fall into three categories as described in NUREG-1199:

C-1.3.1 No Previous Experience

This category includes persons with a two-year associates degree in engineering or equivalent, and persons with a bachelor of science degree in engineering or equivalent with no previous comparable facility or supervisory experience. These two situations are handled as follows:

1. Trainees with a two-year associates degree in engineering or equivalent are required to complete all four requirements of Section C-1.4 of this appendix with no waivers allowed.

2. Trainees with a bachelor of science degree in engineering or equivalent are not required to complete Requirement 1 of Section C-1.4 of this appendix upon presentation of the accredited institution's certified copy of the candidates' official transcript showing the awarding of the degree. These trainees must complete training on Requirements 2, 3, and 4.

C-1.3.2 Experience at Facilities Not Subject to Licensing

This category includes nuclear trained officer and enlisted supervisors from the Navy Nuclear Power Program or Department Supervisors from U.S. Government facilities. These trainees are not required to complete Requirements 1 and 4 of Section C-1.4 of this appendix upon presentation of documentation from the U.S. Navy as a nuclear trained officer or enlisted supervisor or from the Department of Energy of certification as a Department Supervisor. These trainees must complete training on Requirements 2 and 3.

C-1.3.3 Experience at Comparable Facilities Subject to Licensing

This category includes Department Supervisors from other LLW disposal facilities (subject to 10 CFR 20 and 10 CFR 61 licensing) and Department Supervisors from commercial nuclear facilities (subject to 10 CFR 20 and 10 CFR 50 licensing). These trainees are not required to complete Requirements 1, 2, and 4 of Section C-1.4 of this appendix upon presentation of documentation from a licensed LLW disposal facility of certification as a Department Supervisor or from the licensed commercial nuclear facility of certification as a Department Supervisor. These trainees must complete training on Requirement 3.

C-1.4 Position Certification Requirements

The initial certification process consists of four specific and different sections of training and on-the-job experience. The requirements for the specific sections to be completed by each trainee are addressed in Section C-1.3 of this appendix. The four sections are:

1. Phase A. Successful completion of classroom supervisory skills training and evaluation (Course FS-100). This phase will include basic academic skills as will as specific training on the supervisory knowledge and abilities required for a Department Supervisor and Shift Manager.

2. Phase B. Successful completion of required department practical training and evaluation (Course FS-200). This phase will direct the trainee's attention to the specific training requirements of the department the individual will be supervising.

3. Phase C. Successful completion of required facility-specific practical training and evaluation (Course FS-300). This phase will direct the trainee's attention to the specific practical training required for facility supervision specifically when acting as the Shift Manager.

4. Compliance with the onsite experience requirement of the facility.

Certification of a trainee to a facility supervision position will be made only after ensuring all the requirements of training attendance, training evaluations, physical condition, and job work performance and experience, etc., have been satisfied. When the trainee completes position certification, the LLW Disposal Facility Manager is assured the individual is capable of performing all aspects of the tasks for which certification was given. Position certification will be valid indefinitely (unless revoked for cause) and will be reinforced by participation in the continuing training program.

Approval of a trainee's position certification will be the responsibility of the LLW Disposal Facility Manager.

C-1.5 Work Without Certification Policy

Persons initially not certified to perform the duties of a Department Supervisor/Shift Manager would be allowed to perform individual tasks under the following specific conditions:

a. The person is in training to certify as a Department Supervisor or Assistant Department Supervisor/Shift Manager **AND**

b. the trainee has successfully completed and been signed off on the Job Performance Measure (JPM) for the task to be performed **OR**

c. a certified Department Supervisor/Shift Manager is present to direct and monitor the trainee's performance of the task.

This assumes that the individual has met the requirements for General Employee and Radiological Worker Training as described in Appendix D of this curriculum.

C-1.6 Records Maintenance

All training program records of course attendance, course schedules, position certification, lesson plans and outlines, JPMs, on-the-job training, etc., will be maintained in accordance with the LLW disposal facility administrative requirements described in the facility license.

A master listing of certified Department Supervisors/Shift Managers will be maintained. This listing will be in a format such that facility supervision is aware of the certification status of all personnel responsible for the supervision of facility and department tasks. Specifically, the listing should include the following:

a. A list of all facility personnel certified and designated as Department Supervisor/Shift Manager.

- This will include the overall completion date of the certification as well as satisfactory participation in the facility Continuing Training Program.

b. A list of all facility personnel certified and designated as Assistant Department Supervisor/Shift Manager.

- This will include the overall completion date of the certification as well as satisfactory participation in the facility Continuing Training Program.

c. A list of all facility personnel designated as Department and Assistant Department Supervisors/Shift Managers in-training.

- This will include the specific tasks for which they have been trained and associated JPMs that have been signed off. This list determines the tasks they will be allowed to perform without completion of certification per Sections C-1.1 and C-1.5 of this appendix.

C-1.7 Training Matrix

A training matrix (see Attachment 1 of this appendix) will be developed and maintained relating training program information in the format as shown in Section 1.3.15 of this training curriculum. This matrix will outline the specific tasks required to certify as a Department Supervisor/Shift Manager and will delineate the training and evaluation methods needed to provide the trainee the knowledge and skills necessary for certification.

C-1.8 Continuing Training Program

Fully certified Department Supervisors/Shift Managers will participate in the facility Continuing Training Program. This program will be an ongoing series of specific training topics to be presented using the classroom, self-study, and JPM formats. The topics to be covered during each training period (annually) will be determined by the Facility Training Supervisor and the LLW Disposal Facility Manager and should cover selected portions of the initial certification requirements per Sections C-1.4, items 1, 2, and 3 of this appendix as well as lessons learned from facility operations and industry-related events. The topics for each training period should be chosen such that over a specified period (biennially) facility Department Supervisors/Shift Managers would be retrained in all areas of their initial certification requirements.

Documentation of individual participation and completion of these requirements will be maintained and subject to the record keeping requirements as set forth in Section C-1.6 of this appendix.

C-1.9 Training Records

The outlines of the courses, lessons, JPMs and other material that comprise the Facility Supervision Training Program will be maintained and subject to the record keeping requirements as set forth in Section C-1.6 of this appendix. This training material should follow the formats of the following attachments in Section 2 of this document:

a. Section 2, Attachment 2—Job Performance Measure

b. Section 2, Attachment 3—Lesson Outline

C-1.10 References

1. Code of Federal Regulations, Title 10, Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

2. U.S. Nuclear Regulatory Commission, *Standard Format and Content of a License Application for a Low-Level Radioactive Waste Disposal Facility*, NUREG-1199.

Appendix C

Attachment 1

Facility Supervision
Training Matrix

Attachment 1. Facility Supervision Training Matrix

Table 1-1. Supervisory Skills Training.[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Perform simple mathematical calculations	TR	CR	WE	FS-101/102	TRNG
Solve simple problems of physical science	TR	CR	WE	FS-103	TRNG
Explain the basic concepts associated with electricity	TR	CR	WE	FS-104	TRNG
Describe the structure of the atom	TR	CR	WE	FS-105	TRNG
Explain the basic concepts associated with radiation detection and protection	TR	CR	WE	FS-106	TRNG
Explain the basic concepts associated with chemistry	TR	CR	WE	FS-107	TRNG
Explain the basic concepts of leadership, management, and team skills	TR	CR/SS	WE	FS-108	TRNG/CONT
Explain the basic concepts of chain-of-command	TR	CR/SS	WE	FS-109	TRNG/CONT
Explain the basic concepts of funds management	TR	CR/SS	WE	FS-110	TRNG
Explain the basic concepts of verbal and written communications skills	TR	CR/SS	WE	FS-111	TRNG/CONT
Explain the basic concepts of EEO/AA	TR	CR/SS	WE	FS-112	TRNG/CONT
Explain the basic concepts of coordination/directing of personnel activities	TR	CR/SS	WE	FS-113	TRNG/CONT
Explain the basic concepts of problem identification/solving	TR	CR/SS	WE	FS-114	TRNG/CONT
Explain the basic concepts of labor relations	TR	CR/SS	WE	FS-115	TRNG

a.
TR - Train
NT - No-Train
PT - Pre-Train
FS - Facility Supervision
EEO/AA - Equal Employment Opportunity/Affirmative Action
WE - Written Exam
CONT - Contract Vendor
TRNG - Training Department
CR - Classroom
SS - Self-Study
OJT - On-the-Job Training
OT - Over-Train
DEPT - Trainee's Department
JPM - Job Performance Measure

Attachment 1. Facility Supervision Training Matrix

Table 1-2. Department Practical Training.[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Discuss the department Emergency Plan	TR/OT	CR/SS	WE	FS-201	TRNG/DEPT
Discuss the department emergency and abnormal procedures	TR/OT	CR/SS	WE	FS-202	TRNG/DEPT
Discuss and apply the department conduct of operations manual	TR	CR/SS	WE	FS-203	TRNG/DEPT
Discuss the department applicability of OSHA requirements	TR	CR/SS	WE	FS-204	TRNG/DEPT
Discuss and apply the safety manual	TR	CR/SS	WE	FS-205	TRNG
Discuss and apply the lock and tag program	TR	CR/SS	WE/JPM	FS-206	TRNG
Discuss the department reportability requirements	TR/OT	CR/SS	WE/JPM	FS-207	TRNG/DEPT
Discuss the department requirements for procedural compliance	TR	CR/SS	WE	FS-208	TRNG/DEPT
Discuss the criteria/actions for system loss/impairment	TR/OT	CR/SS	WE/JPM	FS-209	TRNG
Discuss the department personnel certification/training requirements	TR	CR/SS	WE	FS-210	TRNG
Discuss the specific responsibilities and limitations of a department supervisor	TR	CR/SS	WE	FS-211	TRNG
Discuss the requirements for department documentation	TR	CR/SS	WE	FS-212	TRNG/DEPT
Discuss the 10 CFR 20 and facility radiation control procedures as they apply to the department	TR	CR/SS	WE	FS-213	TRNG/DEPT
Discuss the facility ALARA Program as it applies to the department	TR	CR/SS	WE	FS-214	TRNG/DEPT
Demonstrate the ability to read and interpret mechanical and electrical prints	TR	CR/SS	WE/JPM	FS-215	TRNG/DEPT
Discuss the department work control procedures	TR	CR/SS	WE	FS-216	TRNG/DEPT
Discuss the facility requisition control procedures as they apply to the department	TR	CR/SS	WE	FS-217	TRNG/DEPT

a.

TR	-	Train	WE	-	Written Exam	CR	-	Classroom	OT	-	Over-Train
NT	-	No-Train	CONT	-	Contract Vendor	SS	-	Self-Study	DEPT	-	Trainee's Department
PT	-	Pre-Train	TRNG	-	Training Department	OJT	-	On-the-Job Training	JPM	-	Job Performance Measure

OSHA - Occupational Safety and Health Administration
CFR - Code of Federal Regulations
ALARA - as low as reasonably achievable
FS - Facility Supervisor

Attachment 1. Facility Supervision Training Matrix

Table 1-2. (continued).[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Discuss the department quality control/assurance program	TR	CR/SS	WE	FS-218	TRNG/DEPT
Discuss the hazard communications program as applicable to the department	TR	CR/SS	WE	FS-219	TRNG/DEPT
Discuss normal department operations	TR	SS	WE	FS-220	DEPT
Demonstrate the ability to locate all equipment, facilities, etc. under the cognizance of the department	TR	OJT/SS	WE/JPM	FS-221	TRNG

a. TR - Train; WE - Written Exam; CR - Classroom; OT - Over-Train
NT - No-Train; CONT - Contract Vendor; SS - Self-Study; DEPT - Trainee's Department
PT - Pre-Train; TRNG - Training Department; OJT - On-the-Job Training; JPM - Job Performance Measure
OSHA - Occupational Safety and Health Administration
CFR - Code of Federal Regulations
ALARA - as low as reasonably achievable
FS - Facility Supervisor

Attachment 1. Facility Supervision Training Matrix

Table 1-3. Facility Practical Training.[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Discuss the Emergency Response Team (Fire Brigade) responsibilities	TR/OT	SS/OJT	WE/JPM	FS-301	TRNG
Discuss the overall facility Emergency Plan	TR/OT	SS/OJT	WE/JPM	FS-302	TRNG
Discuss the facility policy and procedures manual	TR	SS	WE	FS-303	TRNG
Discuss the facility Safety Analysis Report (SAR)	TR	SS	WE	FS-304	TRNG
Discuss the facility fitness-for-duty program/procedures	TR	SS	WE	FS-305	TRNG
Discuss the facility security plan	TR/OT	CR/SS	WE	FS-306	TRNG
Discuss the facility reportability requirements criteria	TR/OT	SS/OJT	WE/JPM	FS-307	TRNG
Initiate and approve Radiation Work Permit	TR	CR/OJT	WE/JPM	FS-308	TRNG
Explain the basic concepts, components, and operation of all major facility systems	TR	CR	WE	FS-309	TRNG
Don and remove protective clothing	TR	CR/OJT	JPM	FS-310	TRNG
Don and remove protective respiratory equipment	TR	CR/OJT	JPM	FS-311	TRNG
Use onsite and offsite communications systems	TR	CR/OJT	JPM	FS-312	TRNG
Demonstrate the ability to supervise the shipping, receiving, transfer, storage, handling, and tracking of radioactive waste	TR	CR/OJT	WE/JPM	FS-313	TRNG
Perform emergency/abnormal actions required for facility evacuation emergency	OT	CR/OJT	WE/JPM	FS-314	TRNG
Perform emergency/abnormal actions required for facility take cover emergency	OT	CR/OJT	WE/JPM	FS-315	TRNG
Perform emergency/abnormal actions required for a fire on facility property	OT	CR/OJT	WE/JPM	FS-316	TRNG
Perform emergency/abnormal actions required for a fire off facility property	OT	CR/OJT	WE/JPM	FS-317	TRNG

a.

TR	-	Train	WE	-	Written Exam	CR	-	Classroom	OT	-	Over-Train
NT	-	No-Train	CONT	-	Contract Vendor	SS	-	Self-Study	DEPT	-	Trainee's Department
PT	-	Pre-Train	TRNG	-	Training Department	OJT	-	On-the-Job Training	JPM	-	Job Performance Measure
CFR	-	Code of Federal Regulations									
ALARA	-	as low as reasonably achievable									
FS	-	Facility Supervision									

Attachment 1. Facility Supervision Training Matrix

Table 1-3. (continued).[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Perform emergency/abnormal actions required for loss/impairment of any emergency response equipment	OT	CR/OJT	WE/JPM	FS-318	TRNG
Perform emergency/abnormal actions required for loss/impairment of evacuation/take cover system	OT	CR/OJT	WE/JPM	FS-319	TRNG
Perform emergency/abnormal actions required for loss/impairment of facility onsite and/or offsite communications systems	OT	CR/OJT	WE/JPM	FS-320	TRNG
Perform emergency/abnormal actions required for radiological casualties	OT	CR/OJT	WE/JPM	FS-321	TRNG
Perform emergency/abnormal actions required for loss/impairment of facility fire detection, alarm and suppression systems	OT	CR/OJT	WE/JPM	FS-322	TRNG
Perform onsite and offsite notifications as required during an emergency/abnormal situation	OT	CR/OJT	WE/JPM	FS-323	TRNG
Perform emergency/abnormal actions required for a vehicle or heavy equipment accident	OT	CR/OJT	WE/JPM	FS-324	TRNG
Perform emergency/abnormal actions required for incidents/accidents involving movement of low-level radioactive waste	OT	CR/OJT	WE/JPM	FS-325	TRNG
Discuss the types of low-level radioactive waste stored at this facility	TR	CR/SS	WE	FS-326	TRNG
Describe the specific waste storage areas at this facility	TR	CR/SS	WE	FS-327	TRNG
Describe the specific equipment used for handling waste at this facility	TR	CR/OJT	WE/JPM	FS-328	TRNG
Perform all shift manager normal shift duties	TR	SS/OJT	JPM	FS-329	TRNG

a.
TR - Train
NT - No-Train
PT - Pre-Train
WE - Written Exam
CONT - Contract Vendor
TRNG - Training Department
CR - Classroom
SS - Self-Study
OJT - On-the-Job Training
OT - Over-Train
DEPT - Trainee's Department
JPM - Job Performance Measure
OSHA - Occupational Safety and Health Administration
CFR - Code of Federal Regulations
ALARA - as low as reasonably achievable
FS - Facility Supervisor

Attachment 1. Facility Supervision Training Matrix

Table 1-3. (continued).[a]

Specific Performance Task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Perform emergency/abnormal actions required for loss/impairment of major facility systems	OT	CR/OJT	WE/JPM	FS-330	TRNG
Perform emergency/abnormal actions required for personnel contamination/injury accident	OT	CR/OJT	WE/JPM	FS-331	TRNG
Discuss the 10 CFR 20 and facility radiation control procedures as the apply to the facility	TR	CR	WE	FS-332	TRNG
Discuss the ALARA program as it applies to the facility	TR	CR	WE	FS-333	TRNG
Discuss the facility fire protection plan	OT	CR/SS	WE	FS-334	TRNG
Discuss the personnel resource manual	TR	CR/SS	WE	FS-335	TRNG
Discuss overall facility normal operation	TR	OJT/SS	WE	FS-336	TRNG
Demonstrate the ability to locate all major facility equipment, building, etc.	TR	OJT/SS	WE/JPM	FS-337	TRNG

a.

TR	-	Train	WE	-	Written Exam	CR	-	Classroom	OT	-	Over-Train
NT	-	No-Train	CONT	-	Contract Vendor	SS	-	Self-Study	DEPT	-	Trainee's Department
PT	-	Pre-Train	TRNG	-	Training Department	OJT	-	On-the-Job Training	JPM	-	Job Performance Measure
CFR	-	Code of Federal Regulations									
ALARA	-	as low as reasonably achievable									
FS	-	Facility Supervision									

Appendix C

Attachment 2

Facility Supervision Certification Record

Attachment 2

Facility Supervision Certification Record

The Facility Supervision Certification Record documents the satisfactory completion of the knowledge and skills requirements of the Facility Supervision Training Program. The Certification Record is divided into the following phases:

PHASE A: Facility Supervision Supervisory Skills Training (Course FS-100)

- There are 16 lessons suggested for inclusion in the supervisory skills portion of the training. These lessons provide refresher training on basic academic skills as well as specific training on leadership and managerial skills. The facility staff member (supervisor, classroom instructor, or designee) should sign the appropriate blocks upon the trainee's attendance and completion of each lesson. This will include any individual lesson evaluation by written examination or the satisfactory completion of a job performance measure (JPM). The facility instructor assigned the responsibility for Facility Supervision training signs for the trainee's successful completion of the Supervisory Skills Training final comprehensive examination with a score of 70% or better.

- In addition to the listed supervisory skills lessons, the facility may need additional lessons to meet specific knowledge requirements from the JPMs in the practical training phases (B and C).

PHASE B: Facility Supervision Department Practical Training (Course FS-200)

- There are 21 tasks suggested for inclusion in the department practical training course. These tasks should be tailored to the department the individual will be supervising and will broadly cover all tasks required of department personnel. The trainer or evaluator should sign the appropriate block upon completion of the training and evaluation of the trainee's ability to satisfactorily perform each task. Fully certified Department Supervisors/Shift Managers and FS Training Instructors may sign as Trainer/Evaluator.

- The matrix of generic tasks may be updated with task additions or deletions based on the results of periodic facility Job-Task evaluations.

PHASE C: Facility Supervision Facility Practical Training (Course FS-300)

- There are 37 tasks suggested for inclusion in the facility practical training course. These tasks are designed to provide the trainee with the specific skills required of a

Shift Manager. The trainer or evaluator should sign the appropriate block upon completion of the training and evaluation of the trainee's ability to satisfactorily perform each task. Fully certified Department Supervisors/Shift Managers and FS Training Instructors may sign as Trainer/Evaluator.

- The matrix of department-specific tasks may be updated with task additions or deletions based on the results of periodic facility Job-Task evaluations.

Upon completion of all certification requirements for Department Supervisor/Shift Manager, final certification is verified by signatures of the trainee and the Facility Training Supervisor. Facility supervisory recommendation of the trainee for this position, verification that experience requirements have been met and approval of the trainee's successful completion of all requirements of the Facility Supervision Training Program is acknowledged by signature of the LLW Disposal Facility Manager. The completed Certification Record is maintained by the Facility Training Supervisor as an official training record and is subject to the record keeping requirements set forth in Section C-1.6 of this appendix as well as those of the parent company quality assurance and human resources programs.

Phase A—Facility Supervision Training Program Supervisory Skills Training Certification Record (FS-100).[a]

Supervisory Skills Training Lesson Course FS-100	Evaluation grade	Trainer/evaluator signature	Date
FS-101 Basic mathematics and algebra			
FS-102 Unit analysis and conversion			
FS-103 Physical science fundamentals			
FS-104 Electrical fundamentals			
FS-105 Nuclear physics fundamentals			
FS-106 Radiation detection and protection fundamentals			
FS-107 Chemistry fundamentals			
FS-108 Leadership, management, and team skills fundamentals			
FS-109 Chain-of-command fundamentals			
FS-110 Funds management fundamentals			
FS-111 Verbal and written communications skills fundamentals			
FS-112 Equal Employment Opportunity/ Affirmative Action fundamentals			
FS-113 Coordination/directing of personnel activities			
FS-114 Concepts of problem identification/solving			
FS-115 Concepts of labor relations			
FS-100 Supervisory Skills Comprehensive Final Examination			

a. The items listed in the supervisory skills training column are intended as a guide for the development of a facility-specific program and can be modified.

Phase B—Facility Supervision Training Program Department Practical Training Certification Record (FS-200).[a]

Department Practical Training Course FS-200		Evaluation grade	Trainer/evaluator signature	Date
FS-201	Department portions of the Facility Emergency Plan			
FS-202	Department emergency and abnormal procedures			
FS-203	Department Conduct of Operations Manual			
FS-204	Department applicability of OSHA requirements			
FS-205	Facility Safety Manual			
FS-206	Facility log and tag procedure			
FS-207	Department reportability requirements			
FS-208	Department procedural compliance requirements			
FS-209	Criteria/actions for system loss/impairment			
FS-210	Department personnel training/ certification requirements			
FS-211	Department supervisor responsibilities and limitations			
FS-212	Department documentation requirements			
FS-213	Department 10 CFR 20 and radiation control procedure requirements			
FS-214	Department portions of facility ALARA program			
FS-215	Use mechanical and electrical prints			
FS-216	Department work control procedures			
FS-217	Department requisition control procedures			
FS-218	Department quality control/ assurance program			
FS-219	Department hazard communications program			
FS-220	Department normal operations			

a. The items listed in the department practical training column are intended as a guide for the development of a facility-specific program and can be modified.

Notes: OSHA - Occupational Safety and Health Administration
CFR - Code of Federal Regulations
ALARA - as low as reasonably achievable

Phase B—Facility Supervision Training Program Department Practical Training Certification Record (continued).[a]

Department Practical Training Course FS-200	Evaluation grade	Trainer/evaluator signature	Date
FS-221 Locate all department facilities and equipment			

a. The items listed in the department practical training column are intended as a guide for the development of a facility-specific program and can be modified.

Phase C—Facility Supervision Training Program Facility Practical Training Certification Record (FS-300).[a]

Facility Practical Training Course FS-300		Evaluation grade	Trainer/evaluator signature	Date
FS-301	Emergency Response Team (Fire Brigade) responsibilities			
FS-302	Facility Emergency Plan			
FS-303	Facility policy and procedures manual			
FS-304	Facility Safety Analysis Report			
FS-305	Facility fitness-for-duty program/procedures			
FS-306	Facility security plan			
FS-307	Facility reportability requirements			
FS-308	Radiation Work Permits			
FS-309	Concepts, components, and operation of facility systems			
FS-310	Use of protective clothing			
FS-311	Use of protective respiratory equipment			
FS-312	Onsite and offsite communications systems			
FS-313	Low-level radioactive waste operations			
FS-314	Perform actions for facility evacuation emergency			
FS-315	Perform actions for facility take cover emergency			
FS-316	Perform actions for fire on facility property			
FS-317	Perform actions for fire off facility property			
FS-318	Perform actions for loss/ impairment of emergency response equipment			
FS-319	Perform actions for loss/ impairment of evacuation/take cover system			

a. The items listed in the facility practical training column are intended as a guide for the development of a facility-specific program and can be modified.

Phase C—Facility Supervision Training Program Facility Practical Training Certification Record (continued).[a]

Facility Practical Training Course FS-300		Evaluation grade	Trainer/evaluator signature	Date
FS-320	Perform actions for loss-impairment of onsite and/or offsite communications systems			
FS-321	Perform actions for radiological casualties			
FS-322	Perform actions for loss/ impairment of fire detection and alarm and suppression systems			
FS-323	Perform onsite and offsite notifications during emergency or abnormal situations			
FS-324	Perform actions for vehicle or heavy equipment accident			
FS-325	Perform actions for incidents/accidents involving movement of low-level radioactive waste			
FS-326	Discuss the low-level radioactive waste at the facility			
FS-327	Describe the specific waste storage areas at the facility			
FS-328	Describe the waste handling equipment used at the facility			
FS-329	Perform all shift manager normal shift duties			
FS-330	Perform actions for loss/impairment of major facility systems			
FS-331	Perform actions for personnel contamination/injury accidents			
FS-332	Facility 10 CFR 20 and radiation control procedure requirements			
FS-333	Facility ALARA program			
FS-334	Facility fire protection plan			
FS-335	Facility personnel resource manual			
FS-336	Overall facility normal operations			

a. The items listed in the facility practical training column are intended as a guide for the development of a facility-specific program and can be modified.

Notes: CFR - Code of Federal Regulations
ALARA - as low as reasonably achievable

Phase C—Facility Supervision Training Program Facility Practical Training Certification Record (continued).[a]

Facility Practical Training Course FS-300	Evaluation grade	Trainer/evaluator signature	Date
FS-337 Locate major facility equipment, buildings, etc.			

a. The items listed in the facility practical training column are intended as a guide for the development of a facility-specific program and can be modified.

Facility Supervision Certification Signature Record

I hereby verify through the review of this Certification Record that I have completed all documented supervisory skills training, department core and specific practical training requirements, and request my certification as a Department Supervisor/Shift Manager. To the best of my knowledge I have no physical or mental disabilities that preclude me from performing the tasks required of this position.

_____ _____

Department Supervisor/Shift Manager Trainee Date

I hereby verify that all required supervisory skills training, department core, and specific practical training for the above named trainee has been satisfactorily completed for the position of Department Supervisor and Shift Manager. Facility training records indicate this trainee has attended all training sessions and satisfactorily passed all examinations and JPM evaluations as documented in this Certification Record.

_____ _____

Facility Training Supervisor or designee Date

I have reviewed this Certification Record and certify the trainee is capable of safely performing all facility required tasks of a Department Supervisor and Shift Manager. Facility records indicate this trainee meets all the experience requirements of Section C-1.3 of this appendix. Documentation for any applicable experience outside this facility is attached.

I have reviewed this Certification Record and hereby certify this trainee as a Department Supervisor and Shift Manager at this facility.

_____ _____

LLW Disposal Facility Manager or designee Date

Appendix C

Attachment 3

Facility Supervision Lesson Outlines

NOTE: When compared to the relative risk to the public health and safety from a LLW disposal facility, the detail included in these outlines may appear to be more than necessary for many operations. The training program developer is cautioned to carefully select what is necessary to meet the facility's specific needs. In some cases, individuals responsible for training may want to instruct from these outlines. In others, it may be more appropriate to develop the outlines into self-study materials. Some facilities may also choose to provide the outlines to outside vendors or educational institutions to develop training for the facility's employees.

Facility Name Lesson Outline FS-101

Program: FS — Facility Supervision

Phase: A — Supervisory Skills Training

Course: FS-100

Lesson Outline: FS-101 — Basic mathematics and algebra

Lesson Topics:

- Add and subtract signed numbers
- Multiply and divide signed numbers
- Convert between numbers expressed in standard form and in scientific notation
- Multiply and divide numbers with exponents without the use of a calculator
- Substitute constants into algebraic equations and solve
- Solve problems using common and/or natural logarithms
- Solve problems using fractions and decimals
- Solve problems using percentages and averages

Facility Name Lesson Outline FS-102

Program: FS — Facility Supervision

Phase: A — Supervisory Skills Training

Course: FS-100

Lesson Outline: FS-102 — Unit analysis and conversion

Lesson Topics:

- State the commonly used unit systems of measurement and the base units for mass, length, and time in each system

- State the values and abbreviations for the following metric prefixes:

  - mega-
  - kilo-
  - centi-
  - milli-
  - micro-
  - nano-
  - pico-

- Given a measurement and the appropriate conversion factor(s) or conversion factor table, convert the measurement to the specified units

Facility Name Lesson Outline FS-103

Program: FS — Facility Supervision

Phase: A — Supervisory Skills Training

Course: FS-100

Lesson Outline: FS-103 — Physical science fundamentals

Lesson Topics:

- Define the terms as they relate to physics:

  - Work
  - Force
  - Energy

- Identify and describe three forms of energy

- Describe each physical state in terms of shape and volume

  - Gas
  - Liquid
  - Solid

- Define and describe the applications of the following principles:

  - Conditions of equilibrium
  - Conservation of energy
  - Density, height, and temperature effects on process fluids
  - Energy
  - Fluid mechanics
  - Force
  - Heat
  - Laws of motion
  - Power
  - Temperature measuring systems
  - Temperature conversions
  - Work
  - Pressure measuring systems

Facility Name Lesson Outline FS-103 (continued)

Program: FS — Facility Supervision

Phase: A — Supervisory Skills Training

Course: FS-100

Lesson Outline: FS-103 — Physical science fundamentals (continued)

Lesson Topics:

- Identify the English and metric units for the following:

  - Pressure (vacuum/pressure, differential pressure)
  - Temperature
  - Flow
  - Volume
  - Mass
  - Weight
  - Distance
  - Time

Facility Name Lesson Outline FS-104

Program: FS — Facility Supervision

Phase: A — Supervisory Skills Training

Course: FS-100

Lesson Outline: FS-104 — Electrical fundamentals

Lesson Topics:

- Describe the facility electrical safety requirements
- Define and describe the basic concepts of the following:
  - Electron theory
  - Insulators
  - Conductors
  - Static electricity
  - Units of electrical measurement
  - Electrical laws
  - Basic electrical circuits
  - Direct current (DC) theory
  - DC sources
  - Alternating current (AC) theory
  - AC sources
- Describe the function, location, and operation of the facility electrical system as follows:
  - Sources of electrical power
  - Distribution
  - Switchgear components
  - Relay and fault protection circuits
- Describe the function and operation of the facility power transformers

Facility Name Lesson Outline FS-105

Program: FS — Facility Supervision

Phase: A — Supervisory Skills Training

Course: FS-100

Lesson Outline: FS-105 — Nuclear physics fundamentals

Lesson Topics:

- Describe the basic structure of the atom, including subatomic particles
- Define the following terms:
  - Atomic number
  - Mass number
  - Atomic mass
  - Fission
  - Criticality
  - Isotope
  - Nuclide
- Describe the neutron sources at this facility
- Describe the radioactive decay process
- Describe how shielding affects radiation levels for the various types of radiation
- Describe the types of fixed and portable shielding available at this facility

Facility Name Lesson Outline FS-106

Program: FS — Facility Supervision

Phase: A — Supervisory Skills Training

Course: FS-100

Lesson Outline: FS-106 — Radiation detection and protection fundamentals

Lesson Topics:

- Identify the following four sources of natural background radiation including the origin, radionuclides, variables, and contribution to exposures:
  - Terrestrial
  - Cosmic
  - Internal emitters
  - Inhaled radionuclides

- Identify the following sources or artificially produced radiation and the magnitude of dose received from each:
  - Nuclear fallout
  - Medical exposures
  - Consumer products
  - Nuclear facilities

- Define radioactivity

- Identify the three major types of radioactive emissions and describe the characteristics of each

- Identify why fission products are unstable

- Define the various radioactivity units of measurement and convert between units

- List all radiation detection and measurement instruments in use at this facility and the detector type in each

- List the types of radiation each detector is designed to detect

- Describe the types of personnel dosimetry in use at this facility and the requirements for use of each

Facility Name Lesson Outline FS-106 (continued)

Program: FS — Facility Supervision

Phase: A — Supervisory Skills Training

Course: FS-100

Lesson Outline: FS-106 — Radiation detection and protection fundamentals (continued)

Lesson Topics:

- Describe types of monitors, locations, and their use at this facility for the following:

  - Continuous air monitors
  - Process radiation monitors
  - Area radiation monitors

- Discuss the effects of radiation on body tissue

- List and compare the federal and facility radiation controls and limits

- Discuss the requirements for use of respiratory equipment

- Discuss the requirements for use of protective clothing

Facility Name Lesson Outline FS-107

Program: FS — Facility Supervision

Phase: A — Supervisory Skills Training

Course: FS-100

Lesson Outline: FS-107 — Chemistry fundamentals

Lesson Topics:

- Define and discuss the following basic chemistry terms:

  - States of matter
  - Acids and bases
  - Corrosion control
  - pH
  - Units of measure

- Discuss the following with regard to the corrosion process:

  - Types
  - Characteristics
  - Prevention

Facility Name Lesson Outline FS-108

Program: FS — Facility Supervision

Phase: A — Supervisory Skills Training

Course: FS-100

Lesson Outline: FS-108 — Leadership, management, and team skills fundamentals

Lesson Topics:

- State the definition of a leader and a manager and discuss the differences
- Discuss the importance in promoting good team skills with department/facility personnel for both normal daily operation and during emergencies.
- Describe and discuss each of the four basic leadership styles as listed:
  - Directing
  - Coaching
  - Supporting
  - Delegating
- For each style of leadership, discuss appropriate facility operations that require each style
- State the definition and discuss examples of situational leadership
- Describe and discuss the three requirements of a dynamic leader as listed below:
  - Goals
  - Praisings
  - Reprimands
- Describe and discuss the three managerial skills and how the percentage of each in a supervisor's job changes as he/she is promoted to higher levels of management:
  - Conceptual skills
  - Human skills
  - Technical skills

Facility Name Lesson Outline FS-108 (continued)

Program:	FS	— Facility Supervision
Phase:	A	— Supervisory Skills Training
Course:	FS-100	
Lesson Outline:	FS-108	— Leadership, Management and Team Skills fundamentals (continued)

Lesson Topics:

- Describe and discuss the following keys to successful management (leadership)

  - Ownership
  - Quality
  - Environment, safety, and health
  - Customer service
  - Communication
  - Critical self-assessment

Facility Name Lesson Outline FS-109

Program: FS — Facility Supervision

Phase: A — Supervisory Skills Training

Course: FS-100

Lesson Outline: FS-109 — Chain-of-command fundamentals

Lesson Topics:

- List and discuss the current facility chain-of-command
- List and discuss the advantages and disadvantages of an established chain-of-command
- Discuss why the chain-of-command is needed more in daily operations than during emergency situations
- Discuss the importance of communications in maintaining the integrity of the chain-of-command

Facility Name Lesson Outline FS-110

Program: FS — Facility Supervision

Phase: A — Supervisory Skills Training

Course: FS-100

Lesson Outline: FS-110 — Funds management fundamentals

Lesson Topics:

- Describe and discuss the funds management responsibilities of all facility supervisory personnel

- Using the facility funds management policy manual, describe and discuss the following:

  - Management of personnel overtime
  - Order/control of consumable supplies
  - Planning and estimating budgets
  - Subcontracting of facility maintenance and upkeep
  - Vehicle and heavy equipment operations

- List and explain the approval levels required for various types and amounts of facility fund expenditures

Facility Name Lesson Outline FS-111

Program: FS — Facility Supervision

Phase: A — Supervisory Skills Training

Course: FS-100

Lesson Outline: FS-111 — Verbal and written communications skills fundamentals

Lesson Topics:

- Describe and discuss how ineffective verbal and written communications skills can adversely affect facility daily operations as well as during emergencies

- List and discuss the advantages of effective verbal communications skills

- Describe and discuss the methods for increasing the effectiveness of facility verbal communications:

  - Use of the phonetic alphabet
  - Verbatim repeat-backs
  - Three-way communications
  - Continuing training

- List and discuss the advantages of effective written communications skills

- Describe and discuss the methods for increasing the effectiveness of facility written communications:

  - Procedure writers guide
  - Standardized written templates
  - Simplified procedures/instructions
  - Continuing training
  - Technical writing courses

Facility Name Lesson Outline FS-112

Program:	FS	— Facility Supervision
Phase:	A	— Supervisory Skills Training
Course:	FS-100	
Lesson Outline:	FS-112	— Equal Employment Opportunity/ Affirmative Action fundamentals

Lesson Topics:

- Using the company/facility Equal Employment Opportunity/ Affirmative Action (EEO/AA) Manual, describe and discuss the requirements of the facility EEO/AA program
- Describe and discuss the facility supervision responsibilities regarding the EEO/AA program
- Describe and discuss the responsibilities of all facility nonsupervisory personnel regrading the EEO/AA program

Facility Name Lesson Outline FS-113

Program: FS — Facility Supervision

Phase: A — Supervisory Skills Training

Course: FS-100

Lesson Outline: FS-113 — Coordination/directing of personnel activities

Lesson Topics:

- Describe and discuss the daily requirements for scheduling and coordinating the activities of your department's personnel
- Describe and discuss normal facility operation requirements when acting as the Shift Manager
- Describe and discuss coordinating department activities during emergency situations
- Describe and discuss emergency facility situation requirements when acting as the Shift Manager
- Discuss actions for call-out/hold over of additional personnel

Facility Name Lesson Outline FS-114

Program: FS — Facility Supervision

Phase: A — Supervisory Skills Training

Course: FS-100

Lesson Outline: FS-114 — Concepts of problem identification/ solving

Lesson Topics:

- List and discuss department and facility-specific methods for recognizing and documenting problems

- Describe and discuss how the following steps can be used to resolve and past, present, and future problems:

  - Situation appraisal
  - Problem analysis
  - Decision analysis
  - Potential problem analysis

- Describe and discuss how to set priorities during a situation and how to use those priorities to deal with the following concerns:

  - Seriousness
  - Urgency
  - Growth
  - Cost
  - Safety
  - Personnel

- Describe and discuss the following steps used in performing a problem analysis:

  - State the departure from the expected norm
  - Indicate what the problem "is" and "is not"
  - Analyze the differences between the "is" and "is not"
  - Determine any changes that have occurred
  - Develop possible causes for the problem
  - Test for the most likely cause
  - Verify the most likely cause is the actual cause

Facility Name Lesson Outline FS-115

Program: FS — Facility Supervision

Phase: A — Supervisory Skills Training

Course: FS-100

Lesson Outline: FS-115 — Concepts of labor relations

Lesson Topics:

- Using the company/facility labor relations manual, describe and discuss the responsibilities of facility supervision regarding bargaining unit personnel

- Using a copy of the current bargaining unit agreement(s), describe and discuss any specific impact on facility daily and emergency operations

Facility Name Lesson Outline FS-201

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-201 — Department portions of the facility Emergency Plan

Lesson Topics:

- Using a copy of the facility Emergency Plan, describe and discuss the following as relevant to your department:

  - Specific sections applicable only to the department
  - Department supervision responsibilities
  - Department personnel responsibilities

- List and describe the locations of all department equipment required to support the facility Emergency Plan

Facility Name Lesson Outline FS-202

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-202 — Department emergency and abnormal procedures

Lesson Topics:

- Describe and discuss the basic guidelines for the development and use of department emergency and abnormal procedures
- List the approvals required for new or revised procedures
- Using copies of all department emergency and abnormal procedures, describe and discuss the following as applicable:
  - All procedure immediate actions
  - All procedure subsequent/supplementary actions
  - All procedure precautions and limitations
  - Department supervision responsibilities

Facility Name Lesson Outline FS-203

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-203 — Department Conduct of Operations Manual

Lesson Topics:

- Using a copy of the department Conduct of Operations Manual, describe and discuss the following as applicable:

  - Shift staffing requirements
  - Shift activities
  - Use of overtime
  - Facility internal personnel notification requirements
  - External organization notification requirements
  - Department log requirements
  - Personnel certification/training status
  - Temporary modifications

- Describe and discuss the department supervision responsibilities regarding conduct of operations

Facility Name Lesson Outline FS-204

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-204 — Department applicability of OSHA requirements

Lesson Topics:

- Using a copy of the Occupational Safety and Health Administration (OSHA) requirements, describe and discuss the following as applicable to the department:

  - General safety requirements
  - Head protection requirements
  - Eye protection requirements
  - Hearing protection requirements
  - Foot protection requirements
  - Confined space entry requirements
  - Heat stress limitations
  - Scaffolding and ladder safety requirements
  - Working in high places safety requirements

- Describe and discuss the company/facility policy regarding OSHA requirements

- Describe and discuss the department supervision responsibilities regarding OSHA requirements

Facility Name Lesson Outline FS-205

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-205 — Facility Safety Manual

Lesson Topics:

- Using the facility Safety Manual, describe and discuss the following:

  - Department supervision responsibilities
  - Department personnel responsibilities
  - Department personnel training requirements
  - Differences from Occupational Safety and Health Administration requirements (more restrictive)
  - Radiation safety requirements
  - Vehicle operation requirements
  - Heavy equipment operation requirements
  - Lifting and rigging equipment requirements
  - Facility cleanliness/housekeeping requirements
  - Routine facility and equipment safety checks

Facility Name Lesson Outline FS-206

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-206 — Facility lock and tag program

Lesson Topics:

- Using the facility lock and tag procedure, describe and discuss the following:

  - Department supervision responsibilities
  - Department personnel responsibilities
  - Types of locks and tags used
  - Criteria for use of each type of lock and tag
  - Steps for locking/tagging out a system
  - Steps for removing locks/tags from a system
  - Criteria requiring second checks/verification
  - Approvals required for locking and tagging a system

Facility Name Lesson Outline FS-207

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-207 — Department reportability requirements

Lesson Topics:

- Locate/review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following as relevant to your department:
  - All department reportability requirements
  - Time limitations for making various reports
  - Step-by-step actions for making reports
  - Preferred communication systems for making reports
  - Alternate communication systems for making reports
  - Documentation requirements for reportable incidents
  - Company/facility internal notification requirements
  - State and local notification requirements
  - Federal notification requirements
- Describe and discuss the department supervisor's responsibilities regarding reportability

Facility Name Lesson Outline FS-208

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-208 — Department procedural compliance requirements

Lesson Topics:

- Locate/review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following as relevant to your department:
  - Requirements for use of controlled versus working copies
  - One-time procedure changes
  - Temporary procedure changes
  - Permanent procedure changes
  - Pen and ink procedure changes
  - Editorial procedure changes
  - Approvals required for procedure changes
  - Requirements for periodic procedure reviews
  - Actions for incorrect procedure discovered while in use
  - Criteria for requiring procedure to be in-hand
  - Criteria/approvals for directly violating a procedure
  - Facility procedure hierarchy
- Describe and discuss department personnel responsibilities regarding procedural compliance

Facility Name Lesson Outline FS-209

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-209 — Criteria/actions for system loss/impairment

Lesson Topics:

- Locate/review applicable procedures/references
- State the definition of system loss and/or impairment
- List the specific facility systems and equipment requiring immediate compensatory actions when a loss/impairment is discovered
- Using the applicable procedures/references, describe and discuss the following:
  - Immediate actions for loss/impairment
  - Subsequent/supplementary actions
  - Reportability requirements
  - Documentation requirements
  - Department supervision responsibilities
  - Department personnel responsibilities

Facility Name Lesson Outline FS-210

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-210 — Department personnel training/certification requirements

Lesson Topics:

- Locate/review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following as relevant to your department:
  - Structure of the facility training program
  - Department supervision responsibilities
  - Sources of training for department personnel
  - Evaluation of personnel performance
  - Department operation feedback to training
  - Requirements for maintaining personnel certification
  - Department special training requirements
  - Department on-going training requirements

Facility Name Lesson Outline FS-211

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-211 — Department supervision responsibilities and limitations

Lesson Topics:

- Locate/review applicable procedures/references
- Describe and discuss your specific department responsibilities and limitations
- Describe and discuss the role of the department supervisor in facility daily operations as well as during emergency situations
- Describe and discuss the facility chain-of-command and your relationship to that chain-of-command

Facility Name Lesson Outline FS-212

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-212 — Department documentation requirements

Lesson Topics:

- List the types of records/reports that your department is responsible for maintaining at this facility

- Explain the requirements for the records management system, such as Quality Control/Quality Assurance, auditability/retrievability, and management information at this facility

- Describe the types of records and reports used by your department at this facility including but not limited to:

  - Facility/system operating logs
  - Equipment clearance and tagouts
  - Maintenance work requests
  - Equipment status logs
  - Confined space entry permits
  - Temporary modifications and jumpers
  - Facility/system operating procedures
  - Facility/system emergency/abnormal procedures
  - Facility/system surveillance/testing procedures
  - Facility emergency plan procedures
  - System/equipment technical manuals
  - System/equipment drawings and prints

- Describe and discuss department supervisor's responsibilities regarding department documentation and records maintenance

Facility Name Lesson Outline FS-213

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-213 — Department 10 CFR 20 and radiation control procedure requirements

Lesson Topics:

- Locate/review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following as relevant to your department:
  - Department personnel federal exposure limits
  - Department personnel administrative exposure limits
  - Use of the ALERT list or equivalent
  - Requirements/approvals to extend exposure limits
  - Requirements/approvals for emergency limits
  - Actions if limits are exceeded
- Describe and discuss department supervisor's responsibilities regarding 10 CFR 20 and facility radiation control procedures

Facility Name Lesson Outline FS-214

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-214 — Department portions of facility ALARA program

Lesson Topics:

- Locate/review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following as relevant to your department:
  - Uses of prejob as low as reasonably achievable (ALARA) review for department tasks
  - Uses of post-job ALARA review for department tasks
  - Department supervision ALARA responsibilities
  - Department personnel ALARA responsibilities

Facility Name Lesson Outline FS-215

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-215 — Use mechanical and electrical prints

Lesson Topics:

- Using a set of mechanical drawings, describe and discuss the following:

  - Meaning of all marks, codes, and symbols
  - Ability to transition from drawing to drawing
  - Determine system flowpaths, parameters, and design

- Using a set of electrical prints, describe and discuss the following:

  - Meaning of all marks, codes, and symbols
  - Ability to transition from print to print
  - Determine electrical flowpaths, parameters, and design

- Using a set of logic diagrams, describe and discuss the following:

  - Meaning of all marks, codes, and symbols
  - Tie in logic and mechanical and electrical drawings

Facility Name Lesson Outline FS-216

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-216 — Department work control procedures

Lesson Topics:

- Locate/review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following as relevant to your department:
  - Equipment status control during operation
  - Equipment status control during maintenance
  - Maintenance work orders
  - Quality control/quality assurance requirements
  - Procedural compliance requirements

Facility Name Lesson Outline FS-217

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-217 — Department requisition control procedures

Lesson Topics:

- Locate/review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following as relevant to your department:
  - Step-by-step procedures for requisitioning materials
  - Limits and approvals required for requisitions

Facility Name Lesson Outline FS-218

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-218 — Department quality control/quality assurance program

Lesson Topics:

- Locate/review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following as relevant to your department:
  - Specific tasks requiring quality control/quality assurance (QC/QA) coverage
  - Special certifications required for QC/QA personnel
  - QC/QA documentation requirements

Facility Name Lesson Outline FS-219

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-219 — Department hazard communications program

Lesson Topics:

- Locate/review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following as relevant to your department:
  - Materials covered by the hazard communications program
  - Definition and requirements of the Material Safety Data Sheets (MSDS) program
  - Department supervision responsibilities
  - Department personnel responsibilities
- List and discuss actions required for uncontrolled spill or release of an MSDS-controlled material
- List and discuss how to read the MSDS postings including personnel hazards

Facility Name Lesson Outline FS-220

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-220 — Department normal operations

Lesson Topics:

- Describe and discuss the normal operational routines of your department from department supervisor's point of view including but not limited to:

  - Daily shift routines
  - Daily logs and documentation requirements
  - Routine receiving of waste shipments
  - Routine handling of waste within the facility
  - Normal preventive maintenance
  - Routine surveillance testing

Facility Name Lesson Outline FS-221

Program: FS — Facility Supervision

Phase: B — Department Practical Training

Course: FS-200

Lesson Outline: FS-221 — Locate all department facilities and equipment

Lesson Topics:

- Given a map of the facility and/or while on a tour, locate the following areas as relevant to your department:

  - Access control for radiologically controlled areas
  - Evacuation/take cover assembly areas
  - Safety office
  - Warehouse
  - Supervisors' offices
  - Maintenance shops
  - Hot machine shop
  - Respiratory protection equipment storage/issue
  - Emergency response facilities
  - Controlled material storage areas
  - Specific low-level radioactive waste storage areas
  - Areas with equipment/personnel access restrictions

- For each of the areas listed above, describe and discuss the following:

  - Emergency equipment storage locations and inventory
  - Fire detection, alarm, and suppression systems
  - Normal and emergency communication systems
  - Normal and emergency entrances and exits
  - Major facility equipment locations

Facility Name Lesson Outline FS-301

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-301 — Emergency Response Team (Fire Brigade) responsibilities

Lesson Topics:

- Describe and discuss the facility emergency situations that would require activation of the emergency response team
- Describe and discuss the department supervisor's responsibilities as a member of the emergency response team
- Describe and discuss the shift manager's responsibilities as a member of the emergency response team
- List the locations and describe the contents of all facility emergency response team equipment lockers
- For all facility emergency breathing equipment, describe and discuss the following:
  - Types, specifications, and limitations
  - Equipment locations
  - Specific conditions requiring/allowing use of each type
- Discuss personnel radiation exposure criteria and limits during emergency situations
- Demonstrate the ability to perform the following for all facility emergency response team equipment:
  - Preuse safety checks and inspections
  - Use during simulated emergency conditions
  - Post-use inspections and storage
- Describe and discuss the facility communications procedures and systems specifically designated for use during emergencies

Facility Name Lesson Outline FS-302

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-302 — Facility Emergency Plan

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, list and discuss all facility entry conditions for the Emergency Plan
- Using the applicable procedures/references, describe and discuss the following for the facility Emergency Plan:
  - Immediate actions
  - Subsequent or supplemental actions
  - Internal company notification requirements
  - External notification requirements
  - Criteria for personnel accountability
  - Criteria for take cover actions
  - Criteria for evacuation actions
- Describe and discuss the facility chain-of-command while implementing the requirements of the Emergency Plan

Facility Name Lesson Outline FS-303

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-303 — Facility policy and procedures manual

Lesson Topics:

- Locate and review applicable procedure/references
- Using the applicable procedure/references, describe and discuss the following:
  - Basic manual contents
  - Company policy statement(s) regarding facility operations
  - Facility personnel responsibilities/accountability

Facility Name Lesson Outline FS-304

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-304 — Facility Safety Analysis Report

Lesson Topics:

- Locate and review applicable procedures/references
- Describe and discuss the purpose of the Safety Analysis Report (SAR)
- List and discuss the contents of the SAR
- Describe and discuss the procedure for changing/modifying the requirements of the SAR
- Describe and discuss the department supervisor/shift manager's responsibilities regarding the SAR
- Discuss the situations allowing violation of SAR requirements and the reportability requirement of that action

Facility Name Lesson Outline FS-305

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-305 — Facility fitness-for-duty program/ procedures

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedure/references, describe and discuss the following:
  - Department supervisor/shift manager's responsibilities
  - Facility personnel responsibilities
  - Security personnel responsibilities
  - Criteria for determining fitness-for-duty
  - Actions for impaired personnel coming to work
  - Actions for impaired personnel while at work
  - Random testing program

Facility Name Lesson Outline FS-306

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-306 — Facility security plan

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following:
  - Security department responsibilities—normal operation
  - Security department responsibilities—emergencies
  - Shift manager/security department interactions
  - Facility physical security equipment/requirements
  - Security while handling waste shipments
  - Local law enforcement agencies assistance agreements
  - Criteria for requesting outside assistance

Facility Name Lesson Outline FS-307

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-307 — Facility reportability requirements

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following:
  - All facility reportability requirements
  - Time limitations for making various reports
  - Step-by-step actions for making reports
  - Preferred communication systems for making reports
  - Alternate communication systems for making reports
  - Documentation requirements for reportable incidents
  - Company/facility internal notification requirements
  - State and local notification requirements
  - Federal notification requirements
- Describe and discuss the shift manager's responsibilities regarding reportability

Facility Name Lesson Outline FS-308

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-308 — Radiation Work Permits

Lesson Topics:

- State the purpose of and the information found on a Radiation Work Permit (RWP)
- Discuss the shift manager's responsibilities in completing and approving an RWP
- Discuss the specific facility work activities that may be controlled by an RWP
- Discuss the posting requirements for RWPs
- Discuss how an facility personnel will know that an RWP is required for entry into a specific area
- Describe the conditions requiring a job-specific RWP
- Describe the facility areas that require an RWP before entry
- List and explain the different types of RWPs used at the facility
- Describe the radiation, contamination, and air sample survey requirements for completing an RWP
- Given a specific set of conditions and a job, complete an RWP for the task
- List the review/approval requirements for RWPs

Facility Name Lesson Outline FS-309

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-309 — Concepts, components, and operation of facility systems

Lesson Topics:

- List and state the function of all major systems supporting facility operation
- For each of the systems listed above, describe and discuss the following:
  - Applicable normal, abnormal, and emergency procedures
  - Major system components
  - Major component normal and backup electrical power supply
  - Criteria for system loss/impairment
  - How system loss/impairment affects facility operations
  - Actions for system loss/impairment

Facility Name Lesson Outline FS-310

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-310 — Use of protective clothing

Lesson Topics:

- Explain the purpose of personnel contamination control standards and regulations
- State the purpose of using protective clothing in contamination areas
- Discuss facility controls to ensure only qualified personnel use protective clothing
- Identify the training and qualifications required for using protective clothing
- Identify the types of protective clothing available and the specific conditions requiring each use
- Discuss how to use a Radiation Work Permit to determine protective clothing requirements
- List the three basic factors that determine protective clothing requirements for personnel protection
- Given contamination survey information on a specific job, select the proper type of protective clothing required
- Discuss the checks required before using of protective clothing
- Demonstrate how to properly don all types of facility protective clothing
- Demonstrate how to properly remove all types of facility protective clothing
- Discuss the required actions for torn or damaged protective clothing while in a radiologically controlled area

Facility Name Lesson Outline FS-311

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-311 — Use of protective respiratory equipment

Lesson Topics:

- Explain the purpose of respiratory protection standards and regulations
- Discuss facility controls to ensure only qualified personnel use respiratory equipment
- Identify the training, fitting, and medical qualifications required for using respiratory equipment
- Identify the types of respiratory equipment available and the specific conditions requiring the use of each
- Discuss how to use a Radiation Work Permit to determine respiratory equipment requirements
- Discuss the safety checks required before using of respiratory equipment
- Demonstrate how to properly don all types of facility respiratory equipment
- Demonstrate how to properly remove all types of facility respiratory equipment
- Discuss the minimum specifications for the breathing air used in forced-fed respiratory equipment

Facility Name Lesson Outline FS-312

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-312 — Onsite and offsite communications systems

Lesson Topics:

- List all facility communications systems and discuss the following about each:

  - Type of system (radio, telephone, etc.)
  - System components and design information
  - Specific system use limitations and restrictions
  - Locations of communication stations as applicable
  - Preferential system(s) for normal communications
  - Preferential system(s) for emergency communications
  - Power supplies for each system
  - Systems available during power outages/blackouts

- List all facility alarm systems and discuss the following about each:

  - Specific conditions requiring the sounding of each alarm
  - Distinctive alarm sound
  - Locations of all alarm stations
  - Initial response actions for all alarms
  - Automatic features associated with each alarm system

- Explain the importance of onsite and offsite communications systems (normal and emergency)

- Describe the methods of maintaining professional communications when using facility communications systems including the phonetic alphabet and repeat backs

- Identify areas of restricted use for each facility communication system and why use is restricted

- Locate and demonstrate the ability to use all facility communications equipment

Facility Name Lesson Outline FS-312 (continued)

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-312 — Onsite and offsite communications systems (continued)

Lesson Topics:

- Explain how to contact key facility personnel and organizations using all applicable communications systems:

  - Shift manager
  - Work supervisor
  - Fire/emergency personnel
  - Security personnel

- Explain how to contact key offsite personnel and organizations using all applicable communications systems:

  - Fire/emergency personnel
  - Medical personnel
  - Nuclear Regulatory Commission
  - State and local agencies

- Describe the application for communication systems and equipment to accomplish the following: direct work activities, perform tests, and emergencies

- Discuss and demonstrate the proper methods for face-to-face communication

Facility Name Lesson Outline FS-313

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-313 — Low-level radioactive waste operations

Lesson Topics:

- Locate and review applicable procedures/references
- List the applicable agencies that have regulations governing the transport of radioactive material
- Define the following terms used in Department Of Transportation (DOT) regulations:
  - Low specific activity
  - Limited quantity
  - Transport index
  - Exclusive use
  - Closed transport vehicle
- List methods that may be used to determine the radionuclide contents of a package
- Describe the necessary radiation and contamination surveys to be performed on packages and state the applicable limits
- Describe the necessary radiation and contamination surveys to be performed on exclusive use vehicles and state the applicable limits
- Identify the proper placement of placards on a transport vehicle
- Identify inspection criteria that should be checked before releasing a shipment at the facility
- List the actions required at the facility if a shipment is received exceeding radiation or contamination limits
- Describe the proper step-by-step method for opening a package containing radioactive material at your facility

Facility Name Lesson Outline FS-313 (continued)

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-313 — Low-level radioactive waste operations (continued)

Lesson Topics:

- Using the applicable procedures/references, describe and discuss the following for handling and moving low-level radioactive waste within the facility:

  - Shipment documentation/paperwork
  - Security requirements
  - Health Physics coverage requirements
  - Specific facility personnel required
  - Step-by-step actions for handling and moving waste
  - Actions for abnormal conditions

- Using the applicable procedures/references, demonstrate the ability to perform the shift manager-required actions for handling and moving low-level radioactive waste within the facility

Facility Name Lesson Outline FS-314

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-314 — Perform actions for facility evacuation emergency

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following for a facility evacuation emergency:
  - Specific conditions requiring an evacuation
  - Alarms/public address announcements directing evacuation
  - Specific evacuation assembly areas
  - Specific routes to evacuation assembly areas
  - Personnel accountability
  - Specific shift manager's responsibilities
  - Reportability requirements
  - Post-event documentation

Facility Name Lesson Outline FS-315

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-315 — Perform actions for facility take cover emergency

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following for a facility take cover emergency:
  - Specific conditions requiring personnel to take cover
  - Alarms/public address announcements directing personnel to take cover
  - Specific take cover areas
  - Specific routes to take cover areas
  - Personnel accountability
  - Specific shift manager's responsibilities
  - Reportability requirements
  - Post-event documentation

Facility Name Lesson Outline FS-316

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-316 — Perform actions for fire on facility property

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following for a fire on facility property:
  - Indications/symptoms
  - Entry conditions
  - Immediate actions for emergency response team personnel
  - Immediate actions for other facility personnel
  - Subsequent/supplementary actions
  - Criteria for requesting offsite fire fighting assistance
  - Specific shift manager's responsibilities
  - Reportability requirements
  - Post-event documentation
  - Post-fire equipment inventory

Facility Name Lesson Outline FS-317

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-317 — Perform actions for fire off facility property

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following for a fire off facility property:
  - Indications/symptoms
  - Entry conditions
  - Immediate actions for emergency response team personnel
  - Immediate actions for other facility personnel
  - Subsequent/supplementary actions
  - Criteria for using facility emergency response team
  - Criteria for requesting offsite fire fighting assistance
  - Specific shift manager's responsibilities
  - Reportability requirements
  - Post-event documentation
  - Post-fire equipment inventory

Facility Name Lesson Outline FS-318

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-318 — Perform actions for loss/impairment of emergency response equipment

Lesson Topics:

- Locate and review applicable procedures/references
- Explain the criteria for, and the indications of, a loss/impairment of emergency response equipment
- Using the applicable procedures/references, describe and discuss the following for a loss/impairment of emergency response equipment:
  - Immediate actions
  - Specific compensatory actions for the loss/impairment
  - Subsequent/supplementary actions
  - Specific shift manager's responsibilities
  - Reportability requirements
  - Required documentation

Facility Name Lesson Outline FS-319

Program:	FS	— Facility Supervision
Phase:	C	— Facility Practical Training
Course:	FS-300	
Lesson Outline:	FS-319	— Perform actions for loss/impairment of evacuation/take cover system

Lesson Topics:

- Locate and review applicable procedures/references
- Explain the criteria for, and the indications of, a loss/impairment of evacuation/take cover system
- Describe and discuss the impact of the loss/impairment on facility operation
- Using the applicable procedures/references, describe and discuss the following for a loss/impairment of evacuation/take cover system:
    - Immediate actions
    - Specific compensatory actions for the loss/impairment
    - Subsequent/supplementary actions
    - Specific shift manager's responsibilities
    - Reportability requirements
    - Required documentation

Facility Name Lesson Outline FS-320

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-320 — Perform actions for loss/impairment of onsite and/or offsite communications systems

Lesson Topics:

- Locate and review applicable procedures/references
- Explain the criteria for, and indications of, a loss/impairment of onsite and/or offsite communications systems
- Describe and discuss the impact of the loss/impairment on facility operation
- List and explain the use of any alternate onsite and offsite communications systems
- Using the applicable procedures/references, describe and discuss the following for a loss/impairment of the onsite and/or offsite communications systems:
    - Immediate actions
    - Specific compensatory actions for the loss/impairment
    - Subsequent/supplementary actions
    - Specific shift manager's responsibilities
    - Reportability requirements
    - Required documentation

Facility Name Lesson Outline FS-321

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-321 — Perform actions for radiological casualties

Lesson Topics:

- Locate and review applicable procedures/references
- List and discuss the following regarding radiological casualties at the facility:
  - Specific types of casualties possible
  - Alarms and other automatic indications
  - Other indications
  - Any automatic actions
  - Specific personnel and facility hazards for each casualty
  - Specific methods for dealing with each casualty
- Using the applicable procedures/references, describe and discuss the following for each radiological casualty at the facility:
  - Immediate actions
  - Subsequent/supplementary actions
  - Take cover/evacuation requirements
  - Criteria for requesting offsite assistance
  - Specific shift manager's responsibilities
  - Reportability requirements
  - Required documentation

Facility Name Lesson Outline FS-322

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-322 — Perform actions for loss/impairment of fire detection/ alarm and suppression systems

Lesson Topics:

- Locate and review applicable procedures/references
- Explain the criteria for, and indications of, a loss/impairment of the facility fire detection, alarm, and suppression systems
- List and explain the use of any alternate fire detection, alarm, and suppression systems
- Describe and discuss the impact of the loss/impairment on facility operation
- Using the applicable procedures/references, describe and discuss the following for a loss/impairment of the fire detection, alarm, and suppression systems:
  - Immediate actions
  - Specific compensatory actions for the loss/impairment
  - Subsequent/supplementary actions
  - Specific shift manager's responsibilities
  - Reportability requirements
  - Required documentation

Facility Name Lesson Outline FS-323

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-323 — Perform onsite and offsite notifications during emergency or abnormal situations

Lesson Topics:

- Locate and review applicable procedures/references
- List and discuss the specific facility events requiring onsite and offsite notifications to be made
- Using the applicable procedures/references, describe and discuss the following for onsite and offsite notifications during an emergency or abnormal situation:
    - Specific actions to make notifications
    - Preferred and alternate communication systems
    - Specific shift manager's responsibilities
    - Requirements for company notification
    - Approvals required for offsite notifications
    - Documentation required

Facility Name Lesson Outline FS-324

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-324 — Perform actions for vehicle or heavy equipment accident

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following for a vehicle or heavy equipment accident on facility property:
  - Indications/symptoms
  - Entry conditions
  - Immediate actions
  - Subsequent/supplementary actions
  - Specific shift manager's responsibilities
  - Reportability requirements
  - Post-event documentation
- Discuss how the above actions will differ if the vehicle or heavy equipment is carrying radioactive material

Facility Name Lesson Outline FS-325

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-325 — Perform actions for incidents/accidents involving movement of low-level radioactive waste

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following:
  - Indications/symptoms
  - Entry conditions
  - Immediate actions
  - Subsequent/supplementary actions
  - Criteria for take cover or evacuation actions
  - Specific shift manager's responsibilities
  - Reportability requirements
  - Post-event documentation

Facility Name Lesson Outline FS-326

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-326 — Discuss the low-level radioactive wastes at the facility

Lesson Topics:

- List all low-level radioactive waste types currently stored at the facility
- List the specific storage locations for each type of waste
- Discuss the access requirements for each storage location
- Discuss the radiological and safety precautions associated with each type of waste
- Discuss the radiological monitoring requirements while handling each type of low-level radioactive waste
- Describe the monitoring requirements while low-level radioactive waste is held in storage
- Discuss the shift manager's responsibilities concerning the low-level radioactive waste currently in storage

Facility Name Lesson Outline FS-327

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-327 — Discuss the specific waste storage areas at the facility

Lesson Topics:

- List the specific facility low-level radioactive waste storage locations
- Describe the construction of each storage area listed above
- Describe personnel and equipment access requirements for each facility storage location
- For each facility storage area listed above, describe and discuss the following:
  - Security systems
  - Fire detection, alarm, and suppression systems
  - Heating, ventilation, and air conditioning systems
  - Radiation monitoring systems
  - Storage capacity limitations and requirements
  - Expected radiation levels
  - Communications systems available

Facility Name Lesson Outline FS-328

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-328 — Describe the waste handling equipment used at the facility

Lesson Topics:

- List and describe all waste handling equipment available at the facility
- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following for all facility waste handling equipment:
    - Specific applications/limitations
    - Specific operator certifications required for use
    - Preuse safety checks and inspections
    - Safety precautions while in use
    - Lift/move/transport all facility waste storage containers
    - Applicable surveillance testing
    - Actions for equipment failure/abnormal conditions

Facility Name Lesson Outline FS-329

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-329 — Perform all shift manager shift duties

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following:
  - Shift turnover procedures
  - Required shift logs and other documentation
  - Required shift facility inspection tours
  - Shift staffing requirements
  - Normal shift routine operations
  - Required shift reports

Facility Name Lesson Outline FS-330

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-330 — Perform actions for loss/impairment of major facility systems

Lesson Topics:

- Locate and review applicable procedures/references
- List and explain the major facility systems whose loss/impairment will require compensatory actions to be taken
- Explain the criteria for, and indications of, a loss/impairment of major facility systems
- Describe and discuss the impact of the loss/impairment on facility operation
- List and explain the use of any alternate systems as applicable
- Using the applicable procedures/references, describe and discuss the following for a loss/impairment of major facility systems:
    - Immediate actions
    - Specific compensatory actions for the loss/impairment
    - Subsequent/supplementary actions
    - Specific shift manager's responsibilities
    - Reportability requirements
    - Required documentation

Facility Name Lesson Outline FS-331

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-331 — Perform actions for personnel contamination/injury accidents

Lesson Topics:

- List and explain all initial actions to be taken for an injured person inside or outside a radiologically controlled area.
- State the item of primary concern when an injury occurs in a radiologically controlled area
- State the factors that affect the decision to move an injured person in a radiologically controlled area
- List the practices to follow when removing a worker that has sustained a minor injury while working in a radiologically controlled area
- State the factors that affect the decision for exposing rescue personnel
- State the criteria for requesting outside medical assistance
- Describe and discuss the reportability requirements for contaminated or contaminated injured personnel

Facility Name Lesson Outline FS-332

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-332 — Facility 10 CFR 20 and radiation control procedure requirements

Lesson Topics:

- Locate and review applicable procedures/references

- Using the applicable procedures/references, describe and discuss the following as relevant to the facility and to the shift manager:

  - Facility personnel federal exposure limits
  - Facility personnel administrative exposure limits
  - Pregnant employee special requirements/limits
  - Use of the ALERT list or equivalent
  - Requirements/approvals to extend exposure limits
  - Requirements/approvals for emergency limits
  - Actions if limits are exceeded

- Describe and discuss shift manager's responsibilities regarding 10 CFR 20 and facility radiation control procedures

Facility Name Lesson Outline FS-333

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-333 — Facility ALARA program

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following:
  - Uses of prejob as low as reasonably achievable (ALARA) review for facility tasks
  - Uses of post-job ALARA review for facility tasks
  - Shift manager's ALARA responsibilities
  - Facility personnel ALARA responsibilities

Facility Name Lesson Outline FS-334

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-334 — Facility fire protection plan

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following:
  - Facility fire detection, alarm, and suppression systems
  - System loss/impairment criteria
  - Compensatory actions for system loss/impairment
  - Availability of alternate systems
  - Shift manager's responsibilities
  - Reportability requirements

Facility Name Lesson Outline FS-335

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-335 — Facility personnel resource manual

Lesson Topics:

- Locate and review applicable procedures/references
- Using the applicable procedures/references, describe and discuss the following:
  - Basic manual contents
  - Company policy statement(s) regarding facility personnel
  - Personnel compensation and benefits tables
  - Personnel advancement and promotion policies
  - Shift manager's responsibilities

Facility Name Lesson Outline FS-336

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-336 — Overall facility normal operations

Lesson Topics:

- Describe and discuss facility normal operations
- Describe and discuss the shift manager's leadership and management responsibilities regarding facility operation

Facility Name Lesson Outline FS-337

Program: FS — Facility Supervision

Phase: C — Facility Practical Training

Course: FS-300

Lesson Outline: FS-337 — Locate major facility equipment and buildings

Lesson Topics:

- Given a map of the facility and/or while on a tour, locate the following areas:

  - Access control for radiologically controlled areas
  - Evacuation/take cover assembly areas
  - Safety office
  - Warehouse
  - Supervisors' offices
  - Maintenance shops
  - Hot machine shop
  - Respiratory protection equipment storage/issue
  - Emergency response facilities
  - Controlled material storage areas
  - Specific low-level radioactive waste storage areas
  - Areas with equipment/personnel access restrictions

- For each of the areas listed above, describe and discuss the following:

  - Emergency equipment storage locations and inventory
  - Fire detection, alarm, and suppression systems
  - Normal and emergency communication systems
  - Normal and emergency entrances and exits
  - Major facility equipment locations

Appendix D

Facility Operations Support Training Program

CONTENTS

D-1 Facility Operations Support Training Program D-7

D-1.1 Applicability D-7

D-1.2 Program Entry Requirements D-7

D-1.2.1 General Employee Training D-7

D-1.2.1.1 Level of Education D-7
D-1.2.1.2 Experience D-7
D-1.2.1.3 Physical Attributes D-8

D-1.2.2 Visitor Training and Orientation D-8

D-1.2.2.1 Level of Education D-8
D-1.2.2.2 Experience D-8
D-1.2.2.3 Physical Attributes D-8

D-1.2.3 Technical Support Training D-8

D-1.2.3.1 Level of Education D-8
D-1.2.3.2 Experience D-9
D-1.2.3.3 Physical Attributes D-9

D-1.3 Training Waiver Policy D-10

D-1.3.1 General Employee Training D-10

D-1.3.2 Visitor Training and Orientation D-10

D-1.3.3 Technical Support D-10

D-1.3.3.1 No Previous Experience D-10
D-1.3.3.2 Experience at Facilities Not Subject to Licensing D-11
D-1.3.3.3 Experience at Comparable Facilities
Subject to Licensing D-11

D-1.4 Position Certification Requirements D-11

D-1.4.1 General Employee Training D-11

D-1.4.2 Visitor Training and Orientation D-12

D-1.4.3 Technical Support (TS) D-13

D-1.5 Work Without Certification Policy D-13

D-1.6 Records Maintenance D-14

D-1.6.1 Master Listing of Facility Employees and Contractors D-14

D-1.6.2 Listing of Facility Visitors D-14

D-1.6.3 Master Listing of Certified Technical Support Personnel D-14

D-1.7 Training Matrix D-15

D-1.8 Continuing Training Program D-15

D-1.8.1 General Employee Training D-15

D-1.8.2 Visitor Training and Orientation D-15

D-1.8.3 Technical Support Training D-15

D-1.9 Training Records D-16

D-1.10 References D-16

Attachment 1-1 Facility Operations Support General Employee Training Training Matrix D-17

Attachment 1-2 Facility Operations Support Visitor Training and Orientation Training Matrix D-23

Attachment 1-3 Facility Operations Support Technical Support Training Training Matrix D-27

Attachment 2-1 Facility Operations Support General Employee Training Certification Records D-31

Attachment 2-2 Facility Operations Support Visitor Training and Orientation Certification Record D-39

Attachment 2-3 Facility Operations Support Technical Support Certification Record D-45

Attachment 3-1 Facility Operations Support General Employee Training Lesson Outlines D-51

Facility Name Lesson Outline GE-101 . . . . . D-53

Facility Name Lesson Outline GE-201 . . . . . D-67

Facility Name Lesson Outline GE-301 . . . . . D-74

Attachment 3-2 Facility Operations Support Visitor Training and Orientation
Lesson Outlines D-87

Facility Name Lesson Outline VT-101 . . . . . D-89

Attachment 3-3 Facility Operations Support Technical Support
Lesson Outlines D-95

Facility Name Lesson Outline TS-101 . . . . . D-97

Facility Name Lesson Outline TS-201 . . . . . D-106

TABLES

1-1-1. General Employee Orientation D-19

1-1-2. Radiological (Radiation) Worker Training I D-20

1-1-3. Radiological (Radiation) Worker Training II D-21

1-2-1. Visitor Training and Orientation D-25

1-3-1. Academic Training D-29

1-3-2. Facility-Specific Practical Training D-30

Appendix D

D-1 Facility Operations Support Training Program

D-1.1 Applicability

The training program described in this appendix is applicable to the training of all personnel at low-level radioactive waste (LLW) disposal facilities and incorporates all training and orientation required for newly hired personnel. For employees designated for facility operations supporting positions such as security, clerical, technical support (i.e., engineering, QA), contractors, janitorial and temporary help, etc., this training provides the majority of the knowledge for which they will be held responsible while employed at the facility. For the employees designated as Facility Supervision, Operations Specialist, or Health Physics Technician, this training provides the preliminary knowledge and skills required for the progression to the specific training program.

In addition, employees designated as technical support will receive training specific to their job description as described in this appendix.

This appendix also describes the training and orientation required for visitors.

D-1.2 Program Entry Requirements

The training and certification requirements as set forth in the various sections of the Facility Operations Support Training Program must be completed by all personnel employed at the facility as well as all visitors and designated technical support employees as applicable.

The individual requirements for entry into each of the three training programs contained within this appendix will be determined by the LLW Disposal Facility Manager and the Facility Training Supervisor as follows:

D-1.2.1 General Employee Training

Factors that should be used for determining eligibility for this program include:

D-1.2.1.1 Level of Education. A high school diploma (or GED equivalent) is required.

D-1.2.1.2 Experience. It is the intention that all facility employees and contractors participate in the basic facility training and orientation. Thus no specific experience levels are applicable here.

D-1.2.1.3 Physical Attributes. Each potential program trainee must meet the following requirements:

- Meets prerequisite conditions of general health as set forth by the facility
- Meets prerequisite conditions for exposure to low levels of radiation
- Has corrected or nonimpaired visual and auditory acuity
- Meets prerequisite criteria for the wearing of respiratory equipment as applicable
- Has the manual dexterity needed to use applicable facility equipment required for his/her job description
- Meets facility fitness-for-duty criteria
- Has the physical strength/stamina necessary to perform applicable tasks required of his/her job description.

D-1.2.2 Visitor Training and Orientation

Factors that should be used for determining eligibility for this program include:

D-1.2.2.1 Level of Education. This is not applicable for personnel visiting the facility.

D-1.2.2.2 Experience. It is the intention that all facility visitors participate in facility visitor training and orientation. Thus no particular experience levels are applicable here.

D-1.2.2.3 Physical Attributes. Each visitor must meet the following requirements:

- Meets prerequisite conditions for visitor exposure to low levels of radiation
- Meets facility fitness-for-duty criteria for visitors.

D-1.2.3 Technical Support Training

Factors that should be used for determining eligibility for this program include:

D-1.2.3.1 Level of Education. A bachelor of science degree in engineering or equivalent is preferred. A high school diploma (or GED equivalent) or an associates degree in engineering or equivalent as well as appropriate technical support experience may be substituted.

D-1.2.3.2 Experience. The following experience level category options are available and may be used:

- Technical support certified at another LLW or commercial nuclear facility (see Section D-1.3.3)

- Technical support certified at a U.S. Government-run nuclear facility (see Section D-1.3.3)

- Two-year associates degree in engineering or equivalent from an accredited technical school or junior college with no previous technical support experience

- Two-year associates degree in engineering or equivalent from an accredited technical school or junior college with previous technical support experience

- Bachelor of science degree in engineering or equivalent from an accredited university with no previous technical support experience

- Bachelor of science degree in engineering or equivalent from an accredited university with previous technical support experience.

D-1.2.3.3 Physical Attributes. Each technical support trainee must meet the following requirements:

- Meets prerequisite conditions of general health as set forth by the facility

- Meets prerequisite conditions for exposure to low levels of radiation

- Has corrected or nonimpaired visual and auditory acuity

- Meets prerequisite criteria for the wearing of respiratory equipment as applicable

- Has the manual dexterity needed to use applicable facility equipment required for technical support personnel

- Meets facility fitness-for-duty criteria

- Has the physical strength/stamina necessary to perform applicable tasks required of technical support personnel.

D-1.3 Training Waiver Policy

Various combinations of the requirements for completion of the Facility Operations Support training program may be waived on a case-by-case basis. Actual waiver determinations will be made by the LLW Disposal Facility Manager and the Facility Training Supervisor and will be based on the trainee's previous experience levels and the specific requirements for each program. The conditions for waiver for each of the three training programs contained in this volume will be discussed separately.

D-1.3.1 General Employee Training

It is the intention and requirement that all facility employees and contractors participate in the basic facility training and orientation without regard to previous experience levels. These individuals will not be granted waivers for General Employee Orientation and must complete training on Requirement 1 of Section D-1.4.1 of this appendix.

Facility employees and contractors will complete Requirements 2 and/or 3 of Section D-1.4.1 based on the requirements of their expected job description as determined by the appropriate Department Supervisor and the Facility Training Supervisor.

D-1.3.2 Visitor Training and Orientation

It is the intention and requirement that all facility visitors participate in facility visitor training and orientation without regard to previous experience levels or other facilities visited. These individuals will not be granted waivers and must complete Requirements 1 and 2 of Section D-1.4.2 of this appendix.

D-1.3.3 Technical Support

Training—The conditions for waiver for technical support designated personnel fall into three categories as described in NUREG-1199:

D-1.3.3.1 No Previous Experience. This category includes persons with a two-year associates degree in engineering or equivalent, and persons with a bachelor of science degree in engineering or equivalent with no previous comparable facility or technical support experience. These two situations are handled as follows:

1. Trainees with a two-year associates degree in engineering or equivalent are required to complete all three requirements of Section D-1.4.3 of this appendix with no waivers allowed.

2. Trainees with a bachelor of science degree in engineering or equivalent are not required to complete Requirement 1 of Section D-1.4.3 of this appendix upon presentation of the accredited institution's certified copy of the candidates' official transcript showing the awarding of the degree. These trainees must complete training on Requirements 2 and 3.

D-1.3.3.2 Experience at Facilities Not Subject to Licensing. This category includes technical support personnel from U.S. Government facilities. These trainees are not required to complete Requirement 1 of Section D-1.4.3 of this appendix upon presentation of documentation from the Department of Energy of technical support certification. These trainees must complete training on Requirements 2 and 3.

D-1.3.3.3 Experience at Comparable Facilities Subject to Licensing. This category includes technical support personnel from other LLW disposal facilities (subject to 10 CFR 20 and

10 CFR 61 licensing) and from commercial nuclear facilities (subject to 10 CFR 20 and 10 CFR 50 licensing). These trainees are not required to complete Requirement 1 of Section D-1.4.3 of this appendix upon presentation of documentation from a licensed LLW disposal facility or from the licensed commercial nuclear facility of technical support certification. These trainees must complete training on Requirement 2.

D-1.4 Position Certification Requirements

Each of the three training programs contained within this appendix consists of specific and different sections of training and on-the-job experience as applicable. The requirements for the specific sections to be completed by each trainee are addressed within the individual subsections of Section D-1.3 of this appendix. The individual training requirements for each of the three training programs contained in this appendix will be discussed separately.

D-1.4.1 General Employee Training

The General Employee Training program consists of three sections of facility orientation and radiological (radiation) worker training to be completed by each trainee as required by his/her job description per Section D-1.3.1 of this appendix. The three sections are:

1. Phase A. Successful completion of General Employee Orientation and evaluation (Course GE-100). This phase will provide a complete facility operation overview and radiological fundamentals orientation. Additional areas covered include safety, first aid, communications, fitness-for-duty, emergency actions, fire protection, etc.

2. Phase B. Successful completion of Radiological (Radiation) Worker Training I (RWI) and evaluation (Course GE-200). This phase is intended for the majority of facility employees requiring access to the radiologically controlled area but who would not normally be expected to enter contaminated areas.

3. Phase C. Successful completion of Radiological (Radiation) Worker Training II (RWII) and evaluation (Course GE-300). This phase will reinforce the training received in Radiological (Radiation) Worker Training I for those personnel who routinely enter contaminated areas or areas of higher radiation levels. In addition, this phase will provide training in the use of respiratory equipment.

Certification of a trainees' completion of the applicable portions of the General Employee Training program will be made only after ensuring all the requirements of training attendance, training evaluations, physical condition, etc., have been satisfied. When the trainee completes General Employee Training certification, the LLW Disposal Facility Manager is assured the individual is capable of performing all aspects of the tasks for which certification was given and is aware of the responsibilities as a facility employee. General Employee Training certification will be valid indefinitely (unless revoked for cause) and will be reinforced by participation in the continuing training program.

Certification of a trainee's completion of the General Employee Training program will be the responsibility of the Facility Training Supervisor.

D-1.4.2 Visitor Training and Orientation

The Visitor Training and Orientation program consists of two sections of facility orientation and radiological (radiation) training as well as entry criteria required of each visitor as a prerequisite to allowing access to the facility. The two sections are:

1. Phase A. Successful completion of Visitor Training and Orientation and evaluation (Course VT-100). This phase consists of training directed to the facility casual visitor. It will cover basic facility layout and radiological orientation as well as the visitor responsibilities while at the facility. This will include safety, security, emergency plan, etc.

2. Compliance with the facility-specific entry requirements (citizenship, identification, fitness-for-duty, etc.).

Visitor access to the facility will be allowed only after it has been ensured that all requirements of the Visitor Training and Orientation program have been satisfied. When the visitor is certified as having completed Visitor Training and Orientation, the LLW Disposal Facility Manager is assured that the individual is aware of his/her responsibilities as a facility visitor. Visitor Training and Orientation certification will be valid for that specific facility visit only.

In addition, all female visitors to the facility must be asked if they are pregnant. If so, they must sign a statement stating that they understand their rights and responsibilities while a visitor at the facility after having received the proper training.

Approval of a visitor's Visitor Training and Orientation certification will be the responsibility of the Facility Training Supervisor.

D-1.4.3 Technical Support (TS)

The Technical Support (TS) training program consists of three specific and different sections of training and on-the-job experience. The three sections are:

1. Phase A—Successful completion of classroom academic training and evaluation (Course TS-100). This phase consists of basic academic skills and will be used for the appropriate technical support personnel as required.

2. Phase B—Successful completion of required facility-specific practical training and evaluation (Course TS-200). This phase will direct the trainee's attention to the specific practical training required for facility technical support personnel as applicable. However, it is expected that most technical support personnel (i.e., clerical, security,

engineering, QA, etc.) will already be knowledgeable in their specific skills area and will not require extensive additional training beyond the facility-specific information they will receive during this phase.

3. Compliance with the onsite experience requirement of the facility.

Certification of a trainee to a technical support position will be made only after ensuring all the requirements of training attendance, training evaluations, physical condition, and job work performance and experience, etc., have been satisfied. When the trainee completes position certification, the LLW Disposal Facility Manager is assured the individual is capable of performing all aspects of the tasks for which certification was given. Position certification will be valid indefinitely (unless revoked for cause) and will be reinforced by participation in the continuing training program.

Approval of the technical support trainee's position certification will be the responsibility of the Department Supervisor to which the trainee is assigned.

D-1.5 Work Without Certification Policy

Two of the three training programs contained within this appendix must be completed prior to the individual being allowed access to the facility or being allowed to perform work. There is no need for a proceduralized method for allowing work to be accomplished prior to completion of General Employee Training or Visitor Training and Orientation certification.

Persons initially not certified to perform the duties of technical support personnel would be allowed to perform individual technical support tasks under the following specific conditions:

a. The person is in training to certify as technical support **AND**

b. The trainee has successfully completed and been signed off on the job performance measure (JPM) for the task to be performed **OR**

c. A certified technical support individual from the same department as the trainee is present to direct and monitor the trainee's performance of the task.

This assumes that the individual has met the requirements for General Employee and Radiological Worker Training as described in this appendix of this curriculum.

D-1.6 Records Maintenance

All training program records of course attendance, course schedules, position certification, lesson plans and outlines, JPMs, on-the-job training, etc., will be maintained in accordance with the LLW disposal facility administrative requirements described in the facility license.

D-1.6.1 Master Listing of Facility Employees and Contractors

A master listing of facility employees and contractors certified as having completed General Employee Training will be maintained. This listing will be in a format such that facility supervision is aware of the General Employee Training certification status of all personnel participating in additional facility training programs.

D-1.6.2 Listing of Facility Visitors

A listing of facility visitors certified as having completed Visitor Training and Orientation will be maintained. This listing will be in a format such that facility supervision and security are aware of the Visitor Training Orientation certification status of all visitors currently within the facility security area.

D-1.6.3 Master Listing of Certified Technical Support Personnel

A master listing of certified technical support personnel will be maintained. This listing will be in a format such that facility supervision is aware of the certification status of all personnel performing technical support tasks. Specifically, the listing should include the following:

a. A list of all facility personnel designated as technical support.

- This will include the overall completion date of the certification as well as the satisfactory participation in the facility Continuing Training Program.

b. A list of all facility personnel designated as technical support in-training.

- This will include the specific tasks for which they have been trained and associated JPMs that have been signed off. This list determines the tasks they will be allowed to perform without completion of certification per Section D-1.5 of this appendix.

D-1.7 Training Matrix

Three training matrixes (see Attachments 1-1, 1-2 and 1-3 of this appendix) will be developed and maintained relating training program information in the format as shown in Section 2.3.15 of this training curriculum. These matrixes will outline the specific tasks required to complete General Employee Training certification, Visitor Training and Orientation certification, and certification as Technical Support. They will describe the training and evaluation methods needed to provide the trainee the knowledge and skills necessary for certification.

D-1.8 Continuing Training Program

Two of the three training programs contained within this appendix will also be factored into the facility Continuing Training Program as discussed below.

D-1.8.1 General Employee Training

Because the material presented in the General Employee Training program is an integral part of each facility employee's and contractor's individual job, this information will become part of the facility Continuing Training Program as presented within each facility department.

This program will be a series of General Employee Training training topics to be presented using the classroom, self-study, and JPM formats. These topics will be integrated into the facility Continuing Training Program at the department level. The topics to be covered during each training period (biennially) will be determined by the Facility Training Supervisor. The topics should cover selected portions of the initial certification requirements per Sections D-1.4, items 1, 2, and 3 of this appendix as well as lessons learned from facility operations and industry related events. The topics for each training period should be chosen such that over a specified period (two years) all facility employees and contractors would be retrained in all areas of their initial General Employee Training certification requirements.

Documentation of individual participation and completion of these requirements will be maintained and subject to the record keeping requirements set forth in Section D-1.6 of this appendix.

D-1.8.2 Visitor Training and Orientation

Due to the limited time that visitors spend within the facility boundary and the small amount of information for which they are held responsible, it is not appropriate or desired to include Visitor Training and Orientation in the facility Continuing Training Program.

D-1.8.3 Technical Support Training

Fully certified technical support personnel will participate in the facility Continuing Training Program at the department level. This program will be a series of specific training topics to be presented using the classroom, self-study, and JPM formats. The topics to be covered during each training period (annually) will be determined by the appropriate Department Supervisor and the Facility Training Supervisor. The topics should cover selected portions of the initial certification requirements per Sections D-1.4.3, items 1 and 2 of this appendix as well as lessons learned from facility operations and industry-related events. The topics for each training period should be chosen such that over a specified period (biennially) facility technical support personnel would be retrained in all areas of their initial certification requirements.

Documentation of individual participation and completion of these requirements will be maintained and subject to the record keeping requirements set forth in Section D-1.6 of this appendix.

D-1.9 Training Records

The outlines of the courses, lessons, JPMs and other material that comprise the Facility Operations Support Training Program will be maintained and subject to the record keeping requirements set forth in Section D-1.6 of this appendix. This training material should follow the formats of the following attachments in Section 2 of the main document:

a. Section 2, Attachment 2—Job Performance Measure

b. Section 2, Attachment 3—Lesson Outline

D-1.10 References

1. Code of Federal Regulations, Title 10, Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste."

2. U.S. Nuclear Regulatory Commission, *Standard Format and Content of a License Application for a Low-Level Radioactive Waste Disposal Facility*, NUREG-1199.

Appendix D

Attachment 1-1

Facility Operations Support
General Employee Training
Training Matrix

Attachment 1-1. General Employee Training Matrix

Table 1-1-1. General Employee Orientation.[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Discuss the basic radiological knowledge requirements for all facility personnel	TR	CR	WE	GE-101	TRNG
Describe the facility mission, organization, and administration	TR	CR	WE	GE-102	TRNG
Discuss the basic facility safety requirements	TR	CR	WE	GE-103	TRNG
Discuss the facility fire protection plan and employee responsibilities	TR	CR	WE	GE-104	TRNG
Describe the facility security guidelines	TR	CR	WE	GE-105	TRNG
Describe the facility onsite and offsite communications systems	TR	CR	WE	GE-106	TRNG
Demonstrate the ability to locate all facility areas, buildings, emergency equipment, etc.	TR	CR	WE	GE-107	TRNG
Describe the facility hazard communications program	TR	CR	WE	GE-108	TRNG
Describe the facility lock and tag program	TR	CR	WE	GE-109	TRNG
Discuss the employee responsibilities regarding the facility emergency plan	TR	CR	WE	GE-110	TRNG
Discuss the facility fitness-for-duty program and the employee responsibilities	TR	CR	WE	GE-111	TRNG
Discuss the facility Emergency Response Team (Fire Brigade)	TR	CR	WE	GE-112	TRNG
Discuss basic first aid requirements	TR	CR	WE/JPM	GE-113	TRNG
Discuss basic cardio-pulmonary resuscitation (CPR) requirements	TR	CR	WE/JPM	GE-114	TRNG

a.

TR	-	Train	WE	-	Written Exam	CR	-	Classroom	OT	-	Over-Train
NT	-	No-Train	CONT	-	Contract Vendor	SS	-	Self-Study	DEPT	-	Trainee's Department
PT	-	Pre-Train	TRNG	-	Training Department	OJT	-	On-the-Job Training	JPM	-	Job Performance Measure
GE	-	General Employee									

Attachment 1-1. General Employee Training Matrix

Table 1-1-2. Radiological (Radiation) Worker Training I.[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Explain the basic concepts associated with radiological fundamentals	TR	CR	WE	GE-201	TRNG
Explain the basic concepts associated with the biological effects of radiation	TR	CR	WR	GE-202	TRNG
Explain the basic concepts associated with radiation detection and protection	TR	CR	WE	GE-203	TRNG
Discuss the 10 CFR 20 and facility radiation control procedures	TR	CR	WE	GE-204	TRNG
Discuss the facility ALARA program	TR	CR	WE	GE-205	TRNG
Discuss and demonstrate the ability to utilize all facility personnel radiation monitoring equipment	TR	CR	WE	GE-206	TRNG
Explain the radiologically controlled area posting signs and the controls associated with them	TR	CR	WE	GE-207	TRNG

a.

TR	-	Train	WE	-	Written Exam	CR	-	Classroom	OT	-	Over-Train
NT	-	No-Train	CONT	-	Contract Vendor	SS	-	Self-Study	DEPT	-	Trainee's Department
PT	-	Pre-Train	TRNG	-	Training Department	OJT	-	On-the-Job Training	JPM	-	Job Performance Measure
ALARA	-	as low as reasonably achievable									
GE	-	General Employee									

Attachment 1-1. General Employee Training Matrix

Table 1-1-3. Radiological (Radiation) Worker Training II.[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Explain the basic concepts associated with radiological fundamentals	TR	CR	WE	GE-301	TRNG
Explain the basic concepts associated with the biological effects of radiation	TR	CR	WE	GE-302	TRNG
Explain the basic concepts associated with radiation detection and protection	TR	CR	WE	GE-303	TRNG
Discuss the 10 CFR 20 and facility radiation control procedures	TR	CR	WE	GE-304	TRNG
Discuss the facility ALARA program	TR	CR	WE	GE-305	TRNG
Discuss how to read and use a Radiological (Radiation) Work Permit	TR	CR	WE	GE-306	TRNG
Discuss and demonstrate the ability to use all facility personnel radiation monitoring equipment	TR	CR	WE	GE-307	TRNG
Explain the radiologically controlled area posting signs and the controls associated with them	TR	CR	WE	GE-308	TRNG
Explain the basic concepts associated with radioactive contamination control	TR	CR	WE	GE-309	TRNG
Discuss the required actions for various radiological emergencies	TR	CR	WE	GE-310	TRNG
Describe the requirements for and use of protective clothing	TR	CR	WE	GE-311	TRNG
Describe the requirements for and use of protective respiratory equipment	TR	CR	WE	GE-312	TRNG

a.

TR	-	Train	WE	-	Written Exam	CR	-	Classroom	OT	-	Over-Train
NT	-	No-Train	CONT	-	Contract Vendor	SS	-	Self-Study	DEPT	-	Trainee's Department
PT	-	Pre-Train	TRNG	-	Training Department	OJT	-	On-the-Job Training	JPM	-	Job Performance Measure
ALARA	-	as low as reasonably achievable									
GE	-	General Employee									

Appendix D

Attachment 1-2

Facility Operations Support
Visitor Training and Orientation
Training Matrix

Attachment 1-2. Visitor Training and Orientation Matrix

Table 1-2-1. Visitor Training and Orientation.[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Describe the basic facility layout	TR	CR/SS	WE	VT-101	TRNG
Discuss basic visitor responsibilities regarding the facility emergency plan	TR	CR/SS	WE	VT-102	TRNG
Discuss basic visitor responsibilities regarding basic radiological knowledge	TR	CR/SS	WE	VT-103	TRNG
Discuss basic visitor/escort responsibilities while at the facility	TR	CR/SS	WE	VT-104	TRNG
Discuss basic visitor responsibilities regarding facility security requirements	TR	CR/SS	WE	VT-105	TRNG
Discuss basic visitor responsibilities regarding facility safety requirements	TR	CR/SS	WE	VT-106	TRNG

a.

TR	-	Train	WE	-	Written Exam	CR	-	Classroom	OT	-	Over-Train
NT	-	No-Train	CONT	-	Contract Vendor	SS	-	Self-Study	DEPT	-	Trainee's Department
PT	-	Pre-Train	TRNG	-	Training Department	OJT	-	On-the-Job Training	JPM	-	Job Performance Measure
VT	-	Visitor Training									

Appendix D

Attachment 1-3

Facility Operations Support
Technical Support Training
Training Matrix

Attachment 1-3. Technical Support Training Matrix

Table 1-3-1. Academic Training.[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Perform simple mathematical calculations	TR	CR	WE	TS-101/102	TRNG
Solve simple problems of physical science	TR	CR	WE	TS-103	TRNG
Explain the basic concepts associated with electricity	TR	CR	WE	TS-104	TRNG
Describe the structure of the atom	TR	CR	WE	TS-105	TRNG
Explain the basic concepts associated with radiation detection and protection	TR	CR	WE	TS-106	TRNG
Explain the basic concepts associated with chemistry	TR	CR	WE	TS-107	TRNG

a.

TR	-	Train	WE	-	Written Exam	CR	-	Classroom	OT	-	Over-Train
NT	-	No-Train	CONT	-	Contract Vendor	SS	-	Self-Study	DEPT	-	Trainee's Department
PT	-	Pre-Train	TRNG	-	Training Department	OJT	-	On-the-Job Training	JPM	-	Job Performance Measure
TS	-	Technical Support									

Attachment 1-3. Technical Support Training Matrix

Table 1-3-2. Facility-Specific Practical Training.[a]

Specific performance task	Training type	Training method	Evaluation method	Lesson outline number	Training source
Discuss the specific responsibilities for facility clerical personnel	TR	SS/OJT	WE/JPM	TS-201	DEPT
Discuss the specific responsibilities for facility security personnel	TR	SS/OJT	WE/JPM	TS-202	DEPT
Discuss the specific responsibilities for facility engineering personnel	TR	SS/OJT	WE/JPM	TS-203	DEPT
Discuss the specific responsibilities for facility Quality Assurance/Control personnel	TR	SS/OJT	WE/JPM	TS-204	DEPT
Discuss the specific responsibilities for other facility personnel	TR	SS/OJT	WE/JPM	TS-205	DEPT

a.

TR	-	Train	WE	-	Written Exam	CR	-	Classroom	OT	-	Over-Train
NT	-	No-Train	CONT	-	Contract Vendor	SS	-	Self-Study	DEPT	-	Trainee's Department
PT	-	Pre-Train	TRNG	-	Training Department	OJT	-	On-the-Job Training	JPM	-	Job Performance Measure
TS	-	Technical Support									

Appendix D

Attachment 2-1

Facility Operations Support General Employee Training Certification Records

Attachment 2-1

General Employee Training
Certification Record

The General Employee Training Certification Record documents the satisfactory completion of the knowledge and skill requirements of the General Employee Training Program. The Certification Record is divided into the following phases:

Phase A: General Employee Orientation (Course GE-100)

- There are 14 lessons/tasks suggested for inclusion in the General Employee Orientation course. The facility staff member (supervisor, classroom instructor, evaluator, or designee) should sign the appropriate blocks upon the trainee's attendance and completion of each lesson or upon the completion of the training and evaluation of the trainee's ability to satisfactorily perform each task. This will include any individual lesson or task evaluation by written examination or the satisfactory completion of a job performance measure (JPM). The facility instructor assigned the responsibility for General Employee Training signs the trainee's successful completion of the General Employee Orientation final comprehensive examination with a score of 70% or better. Fully certified Facility Training Instructors may sign as Trainer/Evaluator.

Phase B: Radiological (Radiation) Worker Training I (Course GE-200)

- There are seven lessons or tasks suggested for inclusion in the Radiological (Radiation) Worker Training I course. The facility staff member (supervisor, classroom instructor, evaluator, or designee) should sign the appropriate blocks upon the trainee's attendance and completion of each lesson or upon the completion of the training and evaluation of the trainee's ability to satisfactorily perform each task. This will include any individual lesson or task evaluation by written examination or the satisfactory completion of a JPM. The facility instructor assigned the responsibility for General Employee Training signs the trainee's successful completion of the Radiological (Radiation) Worker Training I final comprehensive examination with a score of 70% or better. Fully certified Facility Training Instructors may sign as Trainer/Evaluator.

Phase C: Radiological (Radiation) Worker Training II (Course GE-300)

- There are (12) lessons or tasks suggested for inclusion in the Radiological (Radiation) Worker Training II course. The facility staff member (supervisor, classroom instructor, evaluator, or designee) should sign the appropriate blocks upon the trainee's attendance and completion of each lesson. Or the facility staff member should sign the appropriate blocks upon the completion of the training and evaluation of the trainee's ability to satisfactorily perform each task. This will include any individual lesson or task evaluation by written examination or the satisfactory completion of a JPM. The facility instructor assigned the responsibility for General Employee Training signs for the

trainee's successful completion of the Radiological (Radiation) Worker Training II final comprehensive examination with a score of 70% or better. Fully certified Facility Training Instructors may sign as Trainer/Evaluator.

Upon completion of all certification requirements for General Employee Training, final validation is verified by signatures of the trainee and the Facility Training Instructor. Approval of the trainee's completion of all requirements for General Employee Training and final certification is acknowledged by signature of the Facility Training Supervisor. The completed Certification Record will be maintained by the Facility Training Supervisor as an official training record and will be subject to the record keeping requirements set forth in Section D-1.6 of this appendix as well as those of the parent company quality assurance and human resources programs.

Phase A—General Employee Orientation—Certification Record (GE-100).[a]

General Employee Orientation Course GE-100[b]		Evaluation Grade	Trainer/Evaluator Signature	Date
GE-101	Basic facility radiological controls			
GE-102	Facility mission, organization, and administration			
GE-103	Basic facility safety requirements			
GE-104	Basic facility fire protection plan and employee responsibilities			
GE-105	Basic facility security requirements			
GE-106	Facility onsite and offsite communications systems			
GE-107	Basic facility layout			
GE-108	Facility hazard communications program			
GE-109	Facility lock and tag program			
GE-110	Facility emergency plan			
GE-111	Facility fitness-for-duty program			
GE-112	Facility Emergency Response Team (Fire Brigade)			
GE-113	Basic first aid requirements			
GE-114	Basic cardio-pulmonary resuscitation (CPR)			
GE-100	General Employee Orientation Comprehensive Final Examination			

a. The items listed in the General Employee Orientation column are intended as a guide for the development of a facility-specific program and can be modified.

b. GE - General Employee

Phase B—Radiological (Radiation) Worker Training I—Certification Record (GE-200).[a]

Radiological (Radiation) Worker Training I Course GE-200[b]		Evaluation Grade	Trainer/Evaluator Signature	Date
GE-201	Radiological controls fundamentals			
GE-202	Biological effects of radiation			
GE-203	Radiation detection and protection fundamentals			
GE-204	Facility 10 CFR 20 and radiation control procedure requirements			
GE-205	Facility ALARA[c] program			
GE-206	Facility personnel radiation monitoring equipment			
GE-207	Radiologically controlled area posting requirements			
GE-200	Radiological (Radiation) Worker Training I Comprehensive Final Examination			

a. The items listed in the Radiological (Radiation) Worker Training I column are intended as a guide for the development of a facility-specific program and can be modified.

b. GE - General Employee

c. ALARA - as low as reasonably achievable

Phase C—Radiological (Radiation) Worker Training II—Certification Record (GE-300).[a]

Radiological (Radiation) Worker Training II Course GE-300[b]		Evaluation Grade	Trainer/Evaluator Signature	Date
GE-301	Radiological controls fundamentals			
GE-302	Biological effects of radiation			
GE-303	Radiation detection and protection fundamentals			
GE-304	Facility 10 CFR 20 and radiation control procedure requirements			
GE-305	Facility ALARA[c] program			
GE-306	Radiological (Radiation) Work Permits			
GE-307	Facility personnel radiation monitoring equipment			
GE-308	Radiologically controlled area posting requirements			
GE-309	Radioactive contamination control fundamentals			
GE-310	Radiological emergencies			
GE-311	Use of protective clothing			
GE-312	Use of protective respiratory equipment			
GE-300	Radiological (Radiation) Worker Training II Comprehensive Final Examination			

a. The items listed in the Radiological (Radiation) Worker Training II column are intended as a guide for the development of a facility-specific program and can be modified.

b. GE - General Employee

c. ALARA - as low as reasonably achievable

General Employee Training
Certification Signature Record

I hereby verify through the review of this Certification Record that I have fulfilled the requirements for all phases of General Employee Training specified for my job description and request my certification as having completed General Employee Training. To the best of my knowledge I have no physical or mental disabilities that preclude me from performing the tasks required of this training.

_____ _____
General Employee Training Trainee Date

I hereby verify through the review of this Certification Record that the above named trainee has satisfactorily completed all documented General Employee Training requirements.

_____ _____
Facility Training Instructor or designee Date

I hereby verify through review of this Certification Record that the above named trainee has fulfilled the requirements for all phases of General Employee Training as specified for his/her job description. Facility training records indicate this trainee has attended all training sessions and satisfactorily passed all examinations and JPM evaluations as documented in this Certification Record.

I have reviewed this Certification Record and hereby certify this trainee as having completed General Employee Training at this facility.

_____ _____
Facility Training Supervisor or designee Date

Appendix D

Attachment 2-2

Facility Operations Support
Visitor Training and Orientation
Certification Record

Attachment 2-2

Visitor Training and Orientation Certification Record

The Visitor Training and Orientation Certification Record documents the satisfactory completion of the knowledge and skill requirements of the Visitor Training and Orientation Program. The Certification Record for this program consists of a single phase:

Phase A: Visitor Training and Orientation (Course VT-100)

- There are six lessons suggested for inclusion in the Visitor Training and Orientation course. The facility staff member (supervisor, classroom instructor, or designee) should sign the appropriate blocks upon the trainee's attendance and completion of each lesson. This will include any individual lesson evaluation by written examination. The facility instructor assigned the responsibility for Visitor Training and Orientation signs for the trainee's successful completion of the Visitor Training and Orientation final comprehensive examination with a score of 70% or better. Fully certified Facility Training Instructors may sign as Trainer/Evaluator.

Upon completion of all certification requirements for Visitor Training and Orientation, final validation is verified by the signature of the Facility Training Instructor. Approval of the trainee's completion of all requirements for Visitor Training and Orientation and final certification is acknowledged by signature of the Facility Training Supervisor. The completed Certification Record will be maintained by the Facility Training Supervisor as an official training record and will be subject to the record keeping requirements set forth in Section D-1.6 of this appendix as well as those of the parent company quality assurance and human resources programs.

Phase A—Visitor Training and Orientation Program Certification Record (VT-100).[a]

Visitor Training and Orientation Lesson Course VT-100[b]		Evaluation Grade	Trainer/Evaluator Signature	Date
VT-101	Basic facility layout			
VT-102	Facility emergency plan			
VT-103	Facility radiological practices			
VT-104	Facility visitor/escort procedures			
VT-105	Facility security plan			
VT-106	Facility safety requirements			
VT-100	Visitor Training and Orientation Comprehensive Final Examination			

a. The items listed in the Visitor Training and Orientation Lesson column are intended as a guide for the development of a facility-specific program and can be modified.

b. VT - Visitor Training

Visitor Training and Orientation
Certification Signature Record

I hereby verify through the review of this Certification Record that

_____

Trainee's Full Name

has satisfactorily completed all documented Visitor Training and Orientation requirements. To the best of my knowledge, this trainee meets all requirements for entry to the facility as a visitor.

_____ _____

Facility Training Instructor or designee Date

I hereby verify through review of this Certification Record that the above named trainee has fulfilled the requirements for Visitor Training and Orientation as specified for entry to this facility. Facility training records indicate this trainee has attended all training sessions and satisfactorily passed all examinations as documented in this Certification Record.

I have reviewed this Certification Record and hereby certify this trainee as having completed Visitor Training and Orientation and as meeting all requirements for entry to this facility.

_____ _____

Facility Training Supervisor or designee Date

Appendix D

Attachment 2-3

Facility Operations Support
Technical Support
Certification Record

Attachment 2-3

Technical Support
Certification Record

The Technical Support Certification Record documents the satisfactory completion of the knowledge and skill requirements of the Technical Support Training Program. The Certification Record is divided into the following phases:

Phase A: Technical Support Academics Training (Course TS-100)

- There are eight generic lessons suggested for inclusion in the academics portion of the training. The facility staff member (supervisor, classroom instructor, or designee) should sign the appropriate blocks upon the trainee's attendance and completion of each lesson. This will include any individual lesson evaluation by written examination or the satisfactory completion of a JPM. The facility instructor assigned the responsibility for Technical Support training signs for the trainee's successful completion of the Academics Training final comprehensive examination with a score of 70% or better.

- In addition to the listed academic lessons, the facility may need additional lessons to meet specific knowledge requirements from the JPMs in the practical training phase.

Phase B: Technical Support Facility-Specific Practical Training (Course TS-200)

- There are five specific tasks suggested for inclusion in the facility-specific practical training course. The trainer or evaluator should sign the appropriate block upon completion of the training and evaluation of the trainee's ability to satisfactorily perform each task. Fully certified Technical Support personnel and TS Training Instructors may sign as Trainer/Evaluator.

- The matrix of facility-specific tasks may be updated with task additions or deletions based on the results of periodic facility Job-Task evaluations.

Upon completion of all certification requirements for Technical Support personnel, final certification is verified by signatures of the trainee and the Facility Training Supervisor. Facility supervisory recommendation of the trainee for this position and verification that experience requirements are met is by the signature of the trainee's Department Supervisor. Approval of the trainee's successful completion of all requirements of the Technical Support Training Program and final certification is acknowledged by signature of the LLW Disposal Facility Manager. The completed Certification Record will be maintained by the Facility Training Supervisor as an official training record and will be subject to the record keeping requirements set forth in Section D-1.6 of this appendix as well as those of the parent company quality assurance and human resources programs.

Phase A—Technical Support Training Program Academics Training Certification Record (TS-100).[a]

Academic Training Lesson Course TS-100[b]		Evaluation Grade	Trainer/Evaluator Signature	Date
TS-101	Basic mathematics and algebra			
TS-102	Unit analysis and conversion			
TS-103	Physical science fundamentals			
TS-104	Electrical fundamentals			
TS-105	Nuclear physics fundamentals			
TS-106	Radiation detection and protection fundamentals			
TS-107	Chemistry fundamentals			
TS-100	Academics Comprehensive Final Examination			

a. The items listed in the Academic Training Lesson column are intended as a guide for the development of a facility-specific program and can be modified.

b. TS - Technical Support

Phase B—Technical Support Training Program Facility-Specific Practical Training Certification Record (TS-200).[a]

Facility-Specific Practical Training Course TS-200[b]		Evaluation Grade	Trainer/Evaluator Signature	Date
TS-201	Facility clerical personnel specific responsibilities			
TS-202	Facility security personnel specific responsibilities			
TS-203	Facility engineering personnel specific responsibilities			
TS-204	Facility QA/QC personnel specific responsibilities			
TS-205	Other facility personnel specific responsibilities			

a. The items listed in the Facility-Specific Practical Training column are intended as a guide for the development of a facility-specific program and can be modified.

b. TS - Technical Support

Technical Support Certification Signature Record

I hereby verify through the review of this Certification Record that I have completed all documented academic training and facility-specific practical training requirements and request my certification as facility Technical Support for my assigned department. To the best of my knowledge I have no physical or mental disabilities that preclude me from performing the tasks required of this position.

_____ _____

Technical Support Trainee Date

I hereby verify that all required academic training and facility-specific practical training for the above named trainee have been satisfactorily completed for the position of facility Technical Support for the assigned department. Facility training records indicate this trainee has attended all training sessions and satisfactorily passed all examinations and JPM evaluations as documented in this Certification Record.

_____ _____

Facility Training Supervisor or designee Date

I have reviewed this Certification Record and certify the trainee is capable of safely performing all required tasks of facility Technical Support for the assigned department. Facility records indicate this trainee meets all the experience requirements of Section D-1.3 of this appendix. Documentation for any applicable experience outside this facility is attached.

_____ _____

Trainee's Department Supervisor or designee Date

I have reviewed this Certification Record and hereby certify this trainee as Technical Support for the assigned department at this facility.

_____ _____

LLW Disposal Facility Manager or designee Date

Appendix D

Attachment 3-1

Facility Operations Support General Employee Training Lesson Outlines

NOTE: When compared to the relative risk to the public health and safety from a LLW disposal facility, the detail included in these outlines may appear to be more than necessary for many operations. The training program developer is cautioned to carefully select what is necessary to meet the facility's specific needs. In some cases, individuals responsible for training may want to instruct from these outlines. In others, it may be more appropriate to develop the outlines into self-study materials. Some facilities may also choose to provide the outlines to outside vendors or educational institutions to develop training for the facility's employees.

Facility Name Lesson Outline GE-101

Program: GE — General Employee Training

Phase: A — General Employee Orientation

Course: GE-100

Lesson Outline: GE-101 — Basic facility radiological controls

Lesson Topics:

- Identify natural background and manmade sources of radiation
- Identify specific radiation sources at this facility
- State the whole body radiation exposure limit for nonradiological workers
- State the potential biological effects from chronic radiation exposure
- Identify the as low as reasonably achievable (ALARA) concept and practices
- State the methods to control radiological material
- State the employees' responsibility for the ALARA program
- Discuss contamination control
- Discuss the female employee rights and responsibilities regarding radiation exposure while pregnant

Facility Name Lesson Outline GE-102

Program: GE — General Employee Training

Phase: A — General Employee Orientation

Course: GE-100

Lesson Outline: GE-102 — Facility mission, organization, and administration

Lesson Topics:

- Identify the stated mission for this facility
- Given an organizational chart, describe the following:
  - Facility chain-of-command
  - Key facility personnel, positions, and responsibilities
  - Facility department organization
  - Basic function of each department
- State the employee responsibilities regarding the following facility policies:
  - Operating facility equipment
  - Working on facility equipment without authorization
  - Reporting observed problems at the facility
  - Complying with facility health physics rules
  - Complying with facility security rules
  - Smoking and eating while on facility property
  - Procedural compliance
  - Use of controlled documents
  - Facility cleanliness and housekeeping
  - Personal conduct
- Identify the steps involved with self-checking
- State the conditions requiring self-checking

Facility Name Lesson Outline GE-103

Program: GE — General Employee Training

Phase: A — General Employee Orientation

Course: GE-100

Lesson Outline: GE-103 — Basic facility safety requirements

Lesson Topics:

- State the employee industrial safety responsibilities regarding the following:

  - Adherence to safety instructions, procedures, and permits
  - Adherence to safety postings, barriers, tags, and signs
  - Use of personal protective equipment
  - General locations of safety equipment
  - Reporting of unsafe working conditions
  - Reporting of work-related injuries/accidents
  - Administration of first aid (if qualified)

- Recognize the following as potential health and safety hazards as applicable:

  - Electrical equipment
  - Confined spaces
  - Trip and fall hazards
  - Compressed gases
  - Moving/rotating equipment
  - Noise areas
  - Falling objects
  - Hazardous chemicals
  - Eye hazards
  - Low-level radiation
  - Flammable liquids
  - Vehicles and heavy equipment
  - Lifting and rigging equipment

- State the facility policy regarding the use and wearing of the following personal protective equipment:

  - Hard hats and safety glasses
  - Respirators and air packs
  - Hearing protection
  - Protective hand and footwear

Facility Name Lesson Outline GE-104

Program: GE — General Employee Training

Phase: A — General Employee Orientation

Course: GE-100

Lesson Outline: GE-104 — Basic facility fire protection plan and employee responsibilities

Lesson Topics:

- Describe and discuss the following regarding the facility fire protection plan:

  - Actions required of the individual discovering the fire
  - Preferred and alternate methods for reporting the fire
  - Responsibilities for personnel not involved with the fire
  - Recognize and state the response for a facility fire alarm
  - Concerns with fires in a radiologically controlled area

- State the different classes of fires and the appropriate fire extinguishing method for each fire

Facility Name Lesson Outline GE-105

Program: GE — General Employee Training

Phase: A — General Employee Orientation

Course: GE-100

Lesson Outline: GE-105 — Basic facility security requirements

Lesson Topics:

- State the purpose of the facility security program
- State the employee responsibilities regarding the facility security program
- Identify the various facility areas controlled by security and the general requirements for access to each
- Recognize the types and purpose of each type of photo identification badge used at the facility
- Describe the procedure for entering and exiting the facility
- Describe the procedure for entering and exiting security doors
- State when facility security personnel may perform physical searches
- State when and where photo identification badges will be worn and the required actions if badge is lost or found
- Identify materials/items that are prohibited inside the facility boundaries
- Describe visitor/escort responsibilities
- State the required actions upon discovery of an unescorted visitor or an individual without a security badge
- State the employee responsibilities regarding the facility security program

Facility Name Lesson Outline GE-106

Program: GE — General Employee Training

Phase: A — General Employee Orientation

Course: GE-100

Lesson Outline: GE-106 — Facility onsite and offsite communications systems

Lesson Topics:

- List the major facility communications systems and discuss the following about each:

  - Type of system (radio, telephone, etc.)
  - Specific system use limitations and restrictions
  - Locations of communication stations as applicable
  - Preferential system(s) for normal communications
  - Preferential system(s) for emergency communications

- List all major facility alarm systems and discuss the following about each:

  - Specific conditions requiring the sounding of each alarm
  - Distinctive alarm sound
  - Locations of all alarm stations
  - Initial response actions for all alarms

- Explain the importance of onsite and offsite communications systems (normal and emergency)

Facility Name Lesson Outline GE-107

Program: GE — General Employee Training

Phase: A — General Employee Orientation

Course: GE-100

Lesson Outline: GE-107 — Basic facility layout

Lesson Topics:

- Given a map of the facility and/or while on a tour, locate the following areas:

  - Access control for radiologically controlled areas
  - Evacuation/take cover assembly areas
  - Safety office
  - Supervisors' offices
  - Emergency response facilities
  - Controlled material storage areas
  - Specific low-level radioactive waste storage areas
  - Areas with equipment/personnel access restrictions

- For each of the areas listed above, describe and discuss the following:

  - Emergency equipment storage locations and inventory
  - Fire detection, alarm, and suppression systems
  - Normal and emergency communication systems
  - Normal and emergency entrances and exits
  - Major facility equipment locations
  - Storage limits (appendix, curies, time) as applicable

Facility Name Lesson Outline GE-108

Program: GE — General Employee Training

Phase: A — General Employee Orientation

Course: GE-100

Lesson Outline: GE-108 — Facility hazard communications program

Lesson Topics:

- State the purpose of the hazard communications program
- Using the applicable procedures/references, describe and discuss the following:
  - Materials covered by the hazard communications program
  - Definition and requirements of the Material Safety Data Sheet (MSDS) program
  - Facility personnel responsibilities
- List and discuss actions required for uncontrolled spill or release of an MSDS-controlled material
- List and discuss how to read the MSDS postings including personnel hazards

Facility Name Lesson Outline GE-109

Program: GE — General Employee Training

Phase: A — General Employee Orientation

Course: GE-100

Lesson Outline: GE-109 — Facility lock and tag program

Lesson Topics:

- State the purpose of the lock and tag program
- Using the facility lock and tag procedure, describe and discuss the following:
  - Facility personnel responsibilities
  - Types of locks and tags used
  - Criteria for use of each type of lock and tag
  - Steps for locking/tagging out a system
  - Steps for removing locks/tags from a system
  - Approvals required for locking and tagging a system
  - Conditions allowing a locked/tagged system to be operated
- Explain the consequences of violating the requirements of the lock and tag program

Facility Name Lesson Outline GE-110

Program: GE — General Employee Training

Phase: A — General Employee Orientation

Course: GE-100

Lesson Outline: GE-110 — Facility emergency plan

Lesson Topics:

- State the purpose of the facility Emergency Plan
- Recognize all facility emergency alarms and state the proper response for each
- Discuss the purpose of, and the requirements for, personnel accountability during emergency plan implementation
- State the location(s) of all personnel assembly areas for take cover and evacuation emergencies
- Discuss the facility evacuation plan including evacuation routes
- Discuss the facility policy regarding release of information to the public and news media during an emergency

Facility Name Lesson Outline GE-111

Program: GE — General Employee Training

Phase: A — General Employee Orientation

Course: GE-100

Lesson Outline: GE-111 — Facility fitness-for-duty program

Lesson Topics:

- State the purpose of the fitness-for-duty program
- Using the applicable procedure/references, describe and discuss the following:
  - Facility supervision responsibilities
  - Facility personnel responsibilities
  - Security personnel responsibilities
  - Criteria for determining fitness-for-duty
  - Actions for impaired personnel coming to work
  - Actions for impaired personnel while at work
  - Random drug and alcohol testing program
  - Relationship between fitness-for-duty and labor agreement
  - Company/facility policy on controlled substances
  - Company/facility policy on locker and personal searches

Facility Name Lesson Outline GE-112

Program: GE — General Employee Training

Phase: A — General Employee Orientation

Course: GE-100

Lesson Outline: GE-112 — Facility Emergency Response Team (Fire Brigade)

Lesson Topics:

- State the purpose of the Facility Emergency Response Team (Fire Brigade)
- Describe and discuss the facility emergency situations that would require activation of the emergency response team
- List the locations and describe the basic contents of all facility emergency response team equipment lockers
- Describe the facility personnel responsibilities regarding the emergency response team

Facility Name Lesson Outline GE-113

Program: GE — General Employee Training

Phase: A — General Employee Orientation

Course: GE-100

Lesson Outline: GE-113 — Basic first aid requirements

Lesson Topics:

- State the purpose of basic first aid training
- Describe and discuss the facility emergency situations that would require first aid assistance
- Describe and discuss different first aid responses if the victim is in a radiologically controlled area
- Describe the facility personnel responsibilities regarding first aid
- Topics from the basic Red Cross first aid modular training course

Facility Name Lesson Outline GE-114

Program: GE — General Employee Training

Phase: A — General Employee Orientation

Course: GE-100

Lesson Outline: GE-114 — Basic cardiopulmonary resuscitation

Lesson Topics:

- State the purpose of basic cardiopulmonary resuscitation (CPR) training
- Describe and discuss the facility emergency situations that would require CPR assistance
- Describe and discuss different CPR responses if the victim is in a radiologically controlled area
- Describe the facility personnel responsibilities regarding CPR
- Topics from the basic Red Cross CPR modular training course

Facility Name Lesson Outline GE-201

Program: GE — General Employee Training

Phase: B — Radiation Worker Training I

Course: GE-200

Lesson Outline: GE-201 — Radiological controls fundamentals

Lesson Topics:

- Define the following terms:

  - Radioactivity
  - Ionizing radiation
  - Radioactive material
  - Radioactive contamination

- Identify the units for measuring radiation and radioactivity; include standard international units (S.I) conversions

- Identify the major sources of natural background and manmade radiation

Facility Name Lesson Outline GE-202

Program: GE — General Employee Training

Phase: B — Radiation Worker Training I

Course: GE-200

Lesson Outline: GE-202 — Biological effects of radiation

Lesson Topics:

- Identify the average annual dose to the general population from natural background and manmade sources
- State the method by which radiation causes damage to cells
- Identify the possible effects of radiation on cells
- Define the following terms:
  - Acute dose
  - Chronic dose
  - Somatic effect
  - Heritable effect
- State examples of a chronic radiation dose
- State the potential effects associated with prenatal radiation doses

Facility Name Lesson Outline GE-203

Program: GE — General Employee Training

Phase: B — Radiation Worker Training I

Course: GE-200

Lesson Outline: GE-203 — Radiation detection and protection fundamentals

Lesson Topics:

- Identify the following sources of artificially produced radiation and the magnitude of dose received from each:

  - Nuclear fallout
  - Medical exposures
  - Consumer products
  - Nuclear facilities

- Identify the three major types of radioactive emissions and describe the characteristics of each

- List all radiation detection and measurement instruments in use at this facility and the detector type in each

- List the types of radiation each detector is designed to detect

- Describe the types of personnel dosimetry in use at this facility and the requirements for use of each

Facility Name Lesson Outline GE-204

Program: GE — General Employee Training

Phase: B — Radiation Worker Training I

Course: GE-200

Lesson Outline: GE-204 — Facility 10 CFR 20 and radiation control procedure requirements

Lesson Topics:

- State the purpose of the following:

  - Federal radiation dose limits
  - State radiation dose limits
  - Facility administrative radiation dose limits

- State the federal radiation dose limits

- State the state radiation dose limits

- State the facility administrative radiation dose limits

- State the actions required if the facility administrative radiation dose limits are being approached including the steps for approval to exceed these limits

- Describe the conditions allowing the federal radiation exposure limits to be exceeded

- Discuss the facility policy regarding prenatal radiation exposure

- Describe and discuss the employee responsibilities regarding federal, state, and administrative dose limits

Facility Name Lesson Outline GE-205

Program: GE — General Employee Training

Phase: B — Radiation Worker Training I

Course: GE-200

Lesson Outline: GE-205 — Facility ALARA program

Lesson Topics:

- State the definition for the acronym ALARA
- Discuss the ALARA concept
- Discuss the reasons for minimizing/reducing facility personnel radiation exposure
- Discuss the individual's responsibilities in regards to ALARA
- Describe and discuss the following methods of reducing personnel radiation exposure:
  - Time
  - Distance
  - Shielding
- Describe the means by which each of the above listed methods are implemented
- State the specific methods by which radiation exposures have been/will be minimized at this facility

Facility Name Lesson Outline GE-206

Program: GE — General Employee Training

Phase: B — Radiation Worker Training I

Course: GE-200

Lesson Outline: GE-206 — Facility personnel radiation monitoring equipment

Lesson Topics:

- List all personnel radiation monitoring equipment used at the facility
- For each type of personnel radiation monitoring equipment listed above, describe and discuss the following:
  - Purpose
  - Type of radiation monitored and sensitivity
  - Radiation monitoring scale and range
  - Correct methods of wearing and use
  - Actions for off-scale readings or damage or loss
- State the purpose and methods for monitoring internal radiation exposure
- Discuss radiological worker responsibilities regarding radiation dose received from other facilities and from medical applications

Facility Name Lesson Outline GE-207

Program: GE — General Employee Training

Phase: B — Radiation Worker Training I

Course: GE-200

Lesson Outline: GE-207 — Radiologically controlled area posting requirements

Lesson Topics:

- Identify the colors and symbols used on radiological postings, signs, and labels
- Define all types of radiation, contamination, airborne radioactivity, and radioactive material areas
- State the entry, working in and exiting requirements for each area controlled for radiological purposes
- State the radiological and disciplinary consequences of disregarding radiological postings, signs, and labels
- State the radiological and disciplinary consequences of unauthorized removal or relocation of radiological postings, signs, and labels
- State the specific training requirements that must be met prior to entering a posted radiologically controlled area
- Discuss all requirements to enter a radiologically controlled area based on the postings for that area
- State the purpose of and information found on Radiation Work Permits
- Discuss the individual's responsibility in using a Radiation Work Permit
- For personnel contamination monitors, describe and discuss the following:
    - Purpose and use
    - Required actions for alarms
- Describe the facility radiological areas that may be entered by personnel certified as Radiation Worker I

Facility Name Lesson Outline GE-301

Program: GE — General Employee Training

Phase: C — Radiation Worker Training II

Course: GE-300

Lesson Outline: GE-301 — Radiological controls fundamentals

Lesson Topics:

- Identify the three basic particles of an atom
- Define the following terms:
  - Radioactivity
  - Radioactive half-life
  - Ionization
  - Ionizing radiation
  - Radioactive material
  - Radioactive contamination
- Identify the major sources of natural background and manmade radiation
- State the four basic types of ionizing radiation
- Identify the following for each type of ionizing radiation listed above:
  - Physical characteristics
  - Range and effective shielding
  - Biological hazard(s)
- Identify the units for measuring radiation and radioactivity
- Convert rem to millirem and millirem to rem

Facility Name Lesson Outline GE-302

Program: GE — General Employee Training

Phase: C — Radiation Worker Training II

Course: GE-300

Lesson Outline: GE-302 — Biological effects of radiation

Lesson Topics:

- Identify the average annual dose to the general population from natural background and manmade sources
- State the method by which radiation causes damage to cells
- Identify the possible effects of radiation on cells
- Define the following terms:
  - Acute dose
  - Chronic dose
  - Somatic effect
  - Heritable effect
- State examples of a chronic radiation dose
- State the potential effects associated with prenatal radiation doses

Facility Name Lesson Outline GE-303

Program: GE — General Employee Training

Phase: C — Radiation Worker Training II

Course: GE-300

Lesson Outline: GE-303 — Radiation detection and protection fundamentals

Lesson Topics:

- Identify the following sources of artificially produced radiation and the magnitude of dose received from each:

  - Nuclear fallout
  - Medical exposures
  - Consumer products
  - Nuclear facilities

- Identify the three major types of radioactive emissions and describe the characteristics of each

- List all radiation detection and measurement instruments in use at this facility and the detector type in each

- List the types of radiation each detector is designed to detect

- Describe the types of personnel dosimetry in use at this facility and the requirements for use of each

Facility Name Lesson Outline GE-304

Program: GE — General Employee Training

Phase: C — Radiation Worker Training II

Course: GE-300

Lesson Outline: GE-304 — Facility 10 CFR 20 and radiation control procedure requirements

Lesson Topics:

- State the purpose of the following:

  - Federal radiation dose limits
  - State radiation dose limits
  - Facility administrative radiation dose limits

- State the federal radiation dose limits

- State the state radiation dose limits

- State the facility administrative radiation dose limits

- State the actions required if the facility administrative radiation dose limits are being approached including the steps for approval to exceed these limits

- Describe the conditions allowing the federal radiation exposure limits to be exceeded

- Discuss the facility policy regarding prenatal radiation exposure

- Describe and discuss the employee responsibilities regarding federal, state, and administrative dose limits

Facility Name Lesson Outline GE-305

Program: GE — General Employee Training

Phase: C — Radiation Worker Training II

Course: GE-300

Lesson Outline: GE-305 — Facility ALARA program

Lesson Topics:

- State the definition for the acronym ALARA
- Discuss the ALARA concept
- Discuss the reasons for minimizing/reducing facility personnel radiation exposure
- Discuss the individual's responsibilities in regards to ALARA
- Describe and discuss the following methods of reducing personnel radiation exposure:
  - Time
  - Distance
  - Shielding
- Describe the means by which each of the above listed methods are implemented
- State the specific methods by which radiation exposures have been/will be minimized at this facility

Facility Name Lesson Outline GE-306

Program: GE — General Employee Training

Phase: C — Radiation Worker Training II

Course: GE-300

Lesson Outline: GE-306 — Radiation Work Permits

Lesson Topics:

- State the purpose of and the information found on a Radiation Work Permit (RWP)
- Discuss the radiological worker responsibilities in reading and understanding an RWP
- Discuss the specific facility work activities that may be controlled by an RWP
- Discuss the posting requirements for RWPs
- Discuss how an facility personnel will know that an RWP is required for entry into a specific area
- Describe the conditions requiring a job-specific RWP
- Describe the facility areas that require an RWP before entry
- List and explain the different types of RWPs used at the facility

Facility Name Lesson Outline GE-307

Program: GE — General Employee Training

Phase: C — Radiation Worker Training II

Course: GE-300

Lesson Outline: GE-307 — Facility personnel radiation monitoring equipment

Lesson Topics:

- List all personnel radiation monitoring equipment used at the facility
- For each type of personnel radiation monitoring equipment listed above, describe and discuss the following:
  - Purpose
  - Type of radiation monitored and sensitivity
  - Radiation monitoring scale and range
  - Correct methods of wearing and use
  - Actions for off-scale readings or damage or loss
- State the purpose and methods for monitoring internal radiation exposure
- Discuss radiological worker responsibilities regarding radiation dose received from other facilities and from medical applications

Facility Name Lesson Outline GE-308

Program: GE — General Employee Training

Phase: C — Radiation Worker Training II

Course: GE-300

Lesson Outline: GE-308 — Radiologically controlled area posting requirements

Lesson Topics:

- Identify the colors and symbols used on radiological postings, signs, and labels
- Define all types of radiation, contamination, airborne radioactivity, and radioactive material areas
- State the entry, working in, and exiting requirements for each area controlled for radiological purposes
- State the radiological and disciplinary consequences of disregarding radiological postings, signs, and labels
- State the radiological and disciplinary consequences of unauthorized removal or relocation of radiological postings, signs, and labels
- State the specific training requirements that must be met prior to entering a posted radiologically controlled area
- Discuss all requirements to enter a radiologically controlled area based on the postings for that area
- For personnel contamination monitors, describe and discuss the following:
  - Purpose and use
  - Required actions for alarms
- Describe the facility radiological areas that may be entered by personnel certified as Radiation Worker II

Facility Name Lesson Outline GE-309

Program: GE — General Employee Training

Phase: C — Radiation Worker Training II

Course: GE-300

Lesson Outline: GE-309 — Radioactive contamination control fundamentals

Lesson Topics:

- Define the following terms:

  - Fixed contamination
  - Removable (loose) contamination
  - Airborne contamination

- State the units used to measure contamination

- State the sources and indications of radioactive contamination

- Discuss the required to responses to indicators of potential area contamination or personnel contamination alarms

- Discuss the methods used to control radioactive contamination of personnel and areas and why it must be controlled

- Discuss the methods used for personnel decontamination

Facility Name Lesson Outline GE-310

Program: GE — General Employee Training

Phase: C — Radiation Worker Training II

Course: GE-300

Lesson Outline: GE-310 — Radiological emergencies

Lesson Topics:

- Locate/review applicable procedures/references
- List and discuss the following regarding radiological emergencies at the facility:
  - Specific types of emergencies possible
  - Alarms and other automatic indications
  - Other indications
  - Any automatic actions
  - Specific personnel and facility hazards for each emergency
  - Specific methods for dealing with each emergency
- Using the applicable procedures/references, describe and discuss the following for each radiological emergency at the facility:
  - Immediate actions
  - Subsequent/supplementary actions
  - Take cover/evacuation requirements
  - Specific radiological worker responsibilities
- State the federal, state, and facility emergency radiation exposure limits

Facility Name Lesson Outline GE-311

Program: GE — General Employee Training

Phase: C — Radiation Worker Training II

Course: GE-300

Lesson Outline: GE-311 — Use of protective clothing

Lesson Topics:

- Explain the purpose of personnel contamination control standards and regulations
- State the purpose of using protective clothing in contamination areas
- Discuss facility controls to ensure only qualified personnel use protective clothing
- Identify the training and qualifications required for using protective clothing
- Identify the types of protective clothing available and the specific conditions requiring the use of each
- Discuss how to use a Radiation Work Permit to determine protective clothing requirements
- List the three basic factors that determine protective clothing requirements for personnel protection
- Given contamination survey information on a specific job, select the proper type of protective clothing required
- Discuss the checks required before use of protective clothing
- Demonstrate how to properly don all types of facility protective clothing
- Demonstrate how to properly remove all types of facility protective clothing
- Discuss the required actions for torn or damaged protective clothing while in a radiologically controlled area

Facility Name Lesson Outline GE-312

Program: GE — General Employee Training

Phase: C — Radiation Worker Training II

Course: GE-300

Lesson Outline: GE-312 — Use of protective respiratory equipment

Lesson Topics:

- Explain the purpose of respiratory protection standards and regulations
- Discuss facility controls to ensure only qualified personnel use respiratory equipment
- Identify the training, fitting, and medical qualifications required for use of respiratory equipment
- Identify the types of respiratory equipment available and the specific conditions requiring the use of each
- Discuss how to use a Radiation Work Permit to determine respiratory equipment requirements
- Discuss the safety checks required before use of respiratory equipment
- Demonstrate how to properly don all types of facility respiratory equipment
- Demonstrate how to properly remove all types of facility respiratory equipment
- Discuss the minimum specifications for the breathing air used in forced-fed respiratory equipment

Appendix D

Attachment 3-2

Facility Operations Support Visitor Training and Orientation Lesson Outlines

NOTE: When compared to the relative risk to the public health and safety from a LLW disposal facility, the detail included in these outlines may appear to be more than necessary for many operations. The training program developer is cautioned to carefully select what is necessary to meet the facility's specific needs. In some cases, individuals responsible for training may want to instruct from these outlines. In others, it may be more appropriate to develop the outlines into self-study materials. Some facilities may also choose to provide the outlines to outside vendors or educational institutions to develop training for the facility's employees.

Facility Name Lesson Outline VT-101

Program: VT — Visitor Training and Orientation

Phase: A — Visitor Training and Orientation

Course: VT-100

Lesson Outline: VT-101 — Basic facility layout

Lesson Topics:

- Given a map of the facility and/or while on a tour, locate the following areas:

  - Access control for radiologically controlled areas
  - Evacuation/take cover assembly areas
  - Emergency response facilities
  - Specific low-level radioactive waste storage areas
  - Areas with equipment/personnel access restrictions
  - Specific areas off-limits to visitors

Facility Name Lesson Outline VT-102

Program: VT — Visitor Training and Orientation

Phase: A — Visitor Training and Orientation

Course: VT-100

Lesson Outline: VT-102 — Facility Emergency Plan

Lesson Topics:

- State the purpose of the facility Emergency Plan
- Recognize all facility emergency alarms and state the proper response for each
- Discuss the purpose of, and the requirements for, visitor accountability during Emergency Plan implementation
- State the location(s) of all visitor assembly areas for take cover and evacuation emergencies
- Discuss the facility evacuation plan for visitors including evacuation routes

Facility Name Lesson Outline VT-103

Program: VT — Visitor Training and Orientation

Phase: A — Visitor Training and Orientation

Course: VT-100

Lesson Outline: VT-103 — Facility radiological practices

Lesson Topics:

- Discuss the visitor's responsibilities regarding radiation exposure while visiting the facility
- State the radiation dose limits for visitors at the facility
- Given a list, state the facility areas that a visitor may not enter
- Describe and discuss the personnel dosimetry required to be worn by a visitor including its use
- Describe the meaning of all facility radiological signs, postings, warning devices, etc.
- Describe the radiological records that will document the visitor's radiation exposure while at the facility
- State the visitor's rights regarding radiation exposure while at the facility
- Discuss the female visitor's rights and responsibilities regarding radiation exposure while pregnant

Facility Name Lesson Outline VT-104

Program: VT — Visitor Training and Orientation

Phase: A — Visitor Training and Orientation

Course: VT-100

Lesson Outline: VT-104 — Facility visitor/escort procedures

Lesson Topics:

- Discuss the visitor's responsibilities while visiting the facility
- Discuss the escort's responsibilities while escorting a visitor

Facility Name Lesson Outline VT-105

Program: VT — Visitor Training and Orientation

Phase: A — Visitor Training and Orientation

Course: VT-100

Lesson Outline: VT-105 — Facility security plan

Lesson Topics:

- Discuss the visitor's responsibilities regarding the facility security requirements
- Given a list, recognize the items that are not allowed to be brought into the facility
- Discuss the facility requirements for vehicle, briefcase, and personal searches
- Discuss the visitor's access requirements for various facility area

Facility Name Lesson Outline VT-106

Program: VT — Visitor Training and Orientation

Phase: A — Visitor Training and Orientation

Course: VT-100

Lesson Outline: VT-106 — Facility safety requirements

Lesson Topics:

- Discuss the personal safety equipment required for access to various facility areas
- Given a list, describe the various personnel safety hazards found at the facility
- Discuss the visitor's responsibilities regarding safety while visiting the facility

Appendix D

Attachment 3-3

Facility Operations Support
Technical Support
Lesson Outlines

NOTE: When compared to the relative risk to the public health and safety from a LLW disposal facility, the detail included in these outlines may appear to be more than necessary for many operations. The training program developer is cautioned to carefully select what is necessary to meet the facility's specific needs. In some cases, individuals responsible for training may want to instruct from these outlines. In others, it may be more appropriate to develop the outlines into self-study materials. Some facilities may also choose to provide the outlines to outside vendors or educational institutions to develop training for the facility's employees.

Facility Name Lesson Outline TS-101

Program: TS — Technical Support

Phase: A — Academic Training

Course: TS-100

Lesson Outline: TS-101 — Basic mathematics and algebra

Lesson Topics:

- Add and subtract signed numbers
- Multiply and divide signed numbers
- Convert between numbers expressed in standard form and in scientific notation
- Multiply and divide numbers with exponents without the use of a calculator
- Substitute constants into algebraic equations and solve
- Solve problems using common and/or natural logarithms
- Solve problems using fractions and decimals
- Solve problems using percentages and averages

Facility Name Lesson Outline TS-102

Program: TS — Technical Support

Phase: A — Academic Training

Course: TS-100

Lesson Outline: TS-102 — Unit analysis and conversion

Lesson Topics:

- State the commonly used unit systems of measurement and the base units for mass, length, and time in each system

- State the values and abbreviations for the following metric prefixes:

  - mega-
  - kilo-
  - centi-
  - milli-
  - micro-
  - nano-
  - pico-

- Given a measurement and the appropriate conversion factor(s) or conversion factor table, convert the measurement to the specified units

Facility Name Lesson Outline TS-103

Program: TS — Technical Support

Phase: A — Academic Training

Course: TS-100

Lesson Outline: TS-103 — Physical science fundamentals

Lesson Topics:

- Define the terms as they relate to physics:

  - Work
  - Force
  - Energy

- Identify and describe three forms of energy

- Describe each physical state in terms of shape and appendix

  - Gas
  - Liquid
  - Solid

- Define and describe the applications of the following principles:

  - Conditions of equilibrium
  - Conservation of energy
  - Density, height, and temperature effects on process fluids
  - Energy
  - Fluid mechanics
  - Force
  - Heat
  - Laws of motion
  - Power
  - Temperature measuring systems
  - Temperature conversions
  - Work
  - Pressure measuring systems

Facility Name Lesson Outline TS-103 (continued)

Program: TS — Technical Support

Phase: A — Academic Training

Course: TS-100

Lesson Outline: TS-103 — Physical science fundamentals (continued)

Lesson Topics:

- Identify the English and metric units for the following:

  - Pressure (vacuum/pressure, differential pressure)
  - Temperature
  - Flow
  - Volume
  - Mass
  - Weight
  - Distance
  - Time

Facility Name Lesson Outline TS-104

Program: TS — Technical Support

Phase: A — Academic Training

Course: TS-100

Lesson Outline: TS-104 — Electrical fundamentals

Lesson Topics:

- Describe the facility electrical safety requirements
- Define and describe the basic concepts of the following:
  - Electron theory
  - Insulators
  - Conductors
  - Static electricity
  - Units of electrical measurement
  - Electrical laws
  - Basic electrical circuits
  - Direct current (DC) theory
  - DC sources
  - Alternating current (AC) theory
  - AC sources
- Describe the function, location and operation of the facility electrical system as follows:
  - Sources of electrical power
  - Distribution
  - Switchgear components
  - Relay and fault protection circuits
- Describe the function and operation of the facility power transformers

Facility Name Lesson Outline TS-105

Program: TS — Technical Support

Phase: A — Academic Training

Course: TS-100

Lesson Outline: TS-105 — Nuclear physics fundamentals

Lesson Topics:

- Describe the basic structure of the atom, including subatomic particles
- Define the following terms:
  - Atomic number
  - Mass number
  - Atomic mass
  - Fission
  - Criticality
  - Isotope
  - Nuclide
- Describe the neutron sources at this facility
- Describe the radioactive decay process
- Describe how shielding effects radiation levels for the various types of radiation
- Describe the types of fixed and portable shielding available at this facility

Facility Name Lesson Outline TS-106

Program: TS — Technical Support

Phase: A — Academic Training

Course: TS-100

Lesson Outline: TS-106 — Radiation detection and protection fundamentals

Lesson Topics:

- Identify the following four sources of natural background radiation including the origin, radionuclides, variables, and contribution to exposures:

  - Terrestrial
  - Cosmic
  - Internal emitters
  - Inhaled radionuclides

- Identify the following sources or artificially produced radiation and the magnitude of dose received from each:

  - Nuclear fallout
  - Medical exposures
  - Consumer products
  - Nuclear facilities

- Define radioactivity

- Identify the three major types of radioactive emissions and describe the characteristics of each

- Identify why fission products are unstable

- Define the various radioactivity units of measurement and convert between units

- List all radiation detection and measurement instruments in use at this facility and the detector type in each

- List the types of radiation each detector is designed to detect

Facility Name Lesson Outline TS-106 (continued)

Program: TS — Technical Support

Phase: A — Academic Training

Course: TS-100

Lesson Outline: TS-106 — Radiation detection and protection fundamentals (continued)

Lesson Topics:

- Describe the types of personnel dosimetry in use at this facility and the requirements for use of each
- Describe types of monitors, locations, and their use at this facility for the following:
  - Continuous air monitors
  - Process radiation monitors
  - Area radiation monitors
- Discuss the effects of radiation on body tissue
- List and compare the federal and facility radiation controls and limits
- Discuss the requirements for use of respiratory equipment
- Discuss the requirements for use of protective clothing

Facility Name Lesson Outline TS-107

Program: TS — Technical Support

Phase: A — Academic Training

Course: TS-100

Lesson Outline: TS-107 — Chemistry fundamentals

Lesson Topics:

- Define and discuss the following basic chemistry terms:

  - States of matter
  - Acids and bases
  - Corrosion control
  - pH
  - Units of measure

- Discuss the following with regard to the corrosion process:

  - Types
  - Characteristics
  - Prevention

Facility Name Lesson Outline TS-201

Program: TS — Technical Support

Phase: B — Facility-Specific Practical Training

Course: TS-200

Lesson Outline: TS-201 — Facility clerical personnel specific responsibilities

Lesson Topics:

- Describe and discuss the following for facility clerical personnel:

  - Specific job description and responsibilities
  - Radiation worker training requirements
  - Requirements for take cover and evacuation
  - Security responsibilities
  - Department and facility organization
  - Facility Emergency Plan responsibilities

- Describe and discuss the following at the department level:

  - Conduct of operations
  - Procedural compliance requirements
  - Work control procedures
  - Quality control/assurance program
  - Normal operations
  - Location of all facilities and equipment
  - Emergency and abnormal procedures
  - Use of onsite and offsite communications systems

Facility Name Lesson Outline TS-202

Program: TS — Technical Support

Phase: B — Facility-Specific Practical Training

Course: TS-200

Lesson Outline: TS-202 — Facility security personnel-specific responsibilities

Lesson Topics:

- Describe and discuss the following for facility security personnel:

  - Specific job description and responsibilities
  - Radiation worker training requirements
  - Requirements for take cover and evacuation
  - Security responsibilities
  - Department and facility organization
  - Facility Emergency Plan responsibilities
  - Specific weapons training and safety

- Describe and discuss the following at the department level:

  - Conduct of operations
  - Procedural compliance requirements
  - Normal operations
  - Location of all facilities and equipment
  - Emergency and abnormal procedures
  - Use of onsite and offsite communications systems

Facility Name Lesson Outline TS-203

Program: TS — Technical Support

Phase: B — Facility-Specific Practical Training

Course: TS-200

Lesson Outline: TS-203 — Facility engineering personnel-specific responsibilities

Lesson Topics:

- Describe and discuss the following for facility engineering personnel:

  - Specific job description and responsibilities
  - Radiation worker training requirements
  - Requirements for take cover and evacuation
  - Security responsibilities
  - Department and facility organization
  - Facility Emergency Plan responsibilities

- Describe and discuss the following at the department level:

  - Conduct of operations
  - Procedural compliance requirements
  - Work control procedures
  - Quality control/assurance program
  - Normal operations
  - Location of all facilities and equipment
  - Emergency and abnormal procedures
  - Use of onsite and offsite communications systems

Facility Name Lesson Outline TS-204

Program: TS — Technical Support

Phase: B — Facility-Specific Practical Training

Course: TS-200

Lesson Outline: TS-204 — Facility quality assurance/quality control personnel-specific responsibilities

Lesson Topics:

- Describe and discuss the following for facility quality assurance/quality control personnel:

  - Specific job description and responsibilities
  - Radiation worker training requirements
  - Requirements for take cover and evacuation
  - Security responsibilities
  - Department and facility organization
  - Facility Emergency Plan responsibilities

- Describe and discuss the following at the department level:

  - Conduct of operations
  - Procedural compliance requirements
  - Work control procedures
  - Quality control/assurance program
  - Normal operations
  - Location of all facilities and equipment
  - Emergency and abnormal procedures
  - Use of onsite and offsite communications systems

Facility Name Lesson Outline TS-205

Program: TS — Technical Support

Phase: B — Facility-Specific Practical Training

Course: TS-200

Lesson Outline: TS-205 — Facility other personnel-specific responsibilities

Lesson Topics:

- Describe and discuss the following for facility other personnel:

  - Specific job description and responsibilities
  - Radiation worker training requirements
  - Requirements for take cover and evacuation
  - Security responsibilities
  - Department and facility organization
  - Facility Emergency Plan responsibilities

- Describe and discuss the following at the department level:

  - Conduct of operations
  - Procedural compliance requirements
  - Work control procedures
  - Quality control/assurance program
  - Normal operations
  - Location of all facilities and equipment
  - Emergency and abnormal procedures
  - Use of onsite and offsite communications systems