U.S. Department of Energy Orders Self-Study Program

DOE O 426.2

PERSONNEL SELECTION, TRAINING, QUALIFICATION, AND CERTIFICATION REQUIREMENTS FOR DOE NUCLEAR FACILITIES

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FAMILIAR LEVEL

OBJECTIVES

Given the familiar level of this module and the resources, you will be able answer the following questions:

1. What is the purpose of DOE O 426.2, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities?*
2. What are the DOE field elements requirements associated with DOE O 426.2?
3. What are the general contractor requirements specified in the contractor requirements document of DOE O 426.2?
4. What is the purpose for a training implementation matrix?
5. What is the difference between qualification and certification?

Note: If you think that you can complete the practice at the end of this level without working through the instructional material and/or examples, complete the practice now. The course manager will check your work. You will need to complete the practice at this level successfully before taking the criterion test.

RESOURCES

10 CFR 55, "Operators' Licenses." January 1, 2011.
10 CFR 830.122, "Criteria 2—Management/Personnel Training and Qualification." January 1, 2011.
ANSI/ANS 3.1-1993, *American National Standard, Selection, Qualification and Training of Personnel for Nuclear Power Plants.*
ANSI/ANS 15.4-2007, *American National Standard, Selection and Training of Personnel for Research Reactors*.
DOE Orders Self-Study Program, DOE O 422.1, Familiar Level. May 2011.
DOE O 426.2, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities.* April 21, 2010.
DOE-STD-1070-94, *Guidelines for Evaluation of Nuclear Facility Training Programs*. June 1994.
DOE-HDBK-1074-95, *Alternative Systematic Approaches to Training*. August 1994.
DOE-HDBK-1078-94, *Training Program Handbook: A Systematic Approach to Training.* January 1995.
DOE-HDBK-1118-99, *Guide to Good Practices for Continuing Training*. October 1999.
NIRMA TG-15, *Management of Electronic Records.* 1998.
NIRMA TG-17, *Guidelines for Management of Nuclear Related Training Records.* 1998.
NIRMA TG-21, *Electronic Records Protection and Restoration.* 1998.

INTRODUCTION

The familiar level of this module is divided into two sections. In the first section, we will discuss the purpose of DOE O 426.2 and the field elements requirements. In the second section, we will discuss the contractor requirements for personnel selection, training, qualification, and certification at DOE reactor and non-reactor nuclear facilities. We have provided examples throughout the module to help familiarize you with the material. The examples will also help prepare you for the practice at the end of this module and the criterion test.

Before continuing, you should obtain a copy of the resources. Copies of the Orders are available at https://www.directives.doe.gov/directives or through the course manager.

SECTION 1: PURPOSE AND FIELD ELEMENT REQUIREMENTS

Purpose

To establish selection, training, qualification, and certification requirements for contractor personnel who can impact the safety basis through their involvement in the operation, maintenance, and technical support of hazard category 1, 2, and 3 nuclear facilities. The systematic approach to training as defined in the contractor requirements document (CRD) of DOE O 426.2 is designed to ensure that these personnel have the requisite knowledge, skills, and abilities to properly perform work in accordance with the safety basis. The nuclear safety management rule, 10 CFR 830, requires quality assurance programs and documented safety analyses to address training. The training programs established to comply with DOE O 426.2 support those requirements.

DOE O 426.2 updates and consolidates DOE training requirements consistent with applicable aspects of current industry standards of ANSI/ANS 3.1-1993, *American National Standard, Selection, Qualification and Training of Personnel for Nuclear Power Plants,* ANSI/ANS 15.4-2007, *American National Standard, Selection and Training of Personnel for Research Reactors*, and 10 CFR 55, "Operators' Licenses," based on years of DOE experience. Implementation of the requirements of DOE O 426.2 will address 10 CFR 830.122, "Criteria 2—Management/Personnel Training and Qualification."

DOE Field Element Requirements

A selection, training, qualification, and certification program, as described in DOE O 426.2 must be implemented at new and existing hazard category 1, 2, and 3 DOE nuclear facilities, including activities and programs at government-owned and government-operated facilities.

Heads of field organizations/field element manager for NNSA operations or designee must evaluate and approve 1) the contractor training implementation matrix (TIM) or succeeding training program description or plan (TPP), and 2) contractor procedures that are established to release an individual from portions of a training program through prior education, experience, training, and/or qualification/certification.

Heads of field organizations/field element manager for NNSA operations or designee must evaluate contractor training and qualification programs using the methodology described in DOE-STD-1070-94, *Guidelines for Evaluation of Nuclear Facility Training Programs.*

During these evaluations heads of field organizations must verify that the TIM or TPP used to administer the contractor's training program meets the requirements of DOE O 426.2.

Heads of field organizations must provide the results of training program evaluations to the Program Secretarial Officer and the Office of Health, Safety and Security (HSS) for information.

Heads of field organizations must ensure that the entire scope of DOE-STD-1070-94 that is applicable to their site is addressed at least once in each three-year interval. The evaluation program should apply a graded approach to the depth and level of effort of the evaluation, consistent with the hazards and complexity of the activities conducted at site facilities.

Note: You do not have to do example 1 on the following page, but it is a good time to check your skill or knowledge of the information covered. You may do example 1 or go to section 2.

EXAMPLE 1

Using the familiar level of this module and the resources, answer the following questions.

1. What is the purpose of DOE O 426.2?

2. Which DOE facilities are required to implement DOE O 426.2?

3. What methodology must be used to evaluate DOE contractor training?

Note: When you have finished, compare your answers to those contained in the example 1 self-check. When you are satisfied with your answers, go to section 2.

EXAMPLE 1 SELF-CHECK

1. What is the purpose of DOE O 426.2?

   To establish selection, training, qualification, and certification requirements for contractor personnel who can impact the safety basis through their involvement in the operation, maintenance, and technical support of hazard category 1, 2, and 3 nuclear facilities.

2. Which DOE facilities are required to implement DOE O 426.2?

   A selection, training, qualification, and certification program, as described in DOE O 426.2 must be implemented at new and existing hazard category 1, 2, and 3 DOE nuclear facilities.

3. What methodology must be used to evaluate DOE contractor training?

   Heads of field organizations/field element manager for NNSA operations or designee must evaluate contractor training and qualification programs using the methodology described in DOE-STD-1070-94.

SECTION 2 CONTRACTOR REQUIREMENTS DOCUMENT

Chapter I of this CRD establishes general training program requirements that are to be applied to all personnel who can impact the safety basis through their involvement in the operation, maintenance, and technical support of all DOE hazard category 1, 2, and 3 nuclear facilities.

Chapter II of this CRD contains additional training requirements for positions unique to various types of nuclear facilities such as the specific training and certification requirements for reactor operators (ROs).

Chapter 1, General Requirements

Training Implementation Matrix

The contractor must prepare a TIM to identify those sections of the CRD that are applicable to a particular facility. The TIM defines and describes the application of the selection, qualification, certification, and training requirements. It must clearly define the organization, planning, and administration of the program and set forth the responsibility, authority, and methods for conducting training. Suitable justification must be included in the TIM for CRD provisions that are not implemented. At sites with several facilities, a combined TIM may be submitted.

Training Organization

The operating contractor must establish one or more organizations to be responsible for the training of all applicable personnel. This organization(s) must be held accountable for providing the support necessary to ensure that personnel are qualified to safely and effectively meet job requirements. The responsibilities, qualifications, and authority of training organization personnel must be documented, and managerial roles, responsibilities, authority, and accountability clearly defined.

Personnel Selection

The contractor must establish a process for selection and assignment of personnel. This process must include factors such as background, experience, education, and medical examination (as applicable), and should be based on the ability of the person to meet job performance requirements. Selection of personnel may involve a selection test.

Initial Training

A training program must be established for operations, maintenance, and technical staff personnel using the systematic approach to training process. The basic elements of a systematic approach to training include: a systematic analysis of the jobs to be performed; learning objectives derived from the analysis of the job that describe desired performance after training; training design, development, and implementation based on the learning objectives; evaluation of trainee mastery of the objectives during training; and evaluation and revision of the training based on the performance of trained personnel in the job setting.

DOE-HDBK-1078-94, *Training Program Handbook: A Systematic Approach to Training*, and DOE-HDBK-1074-95, *Alternative Systematic Approaches to Training*, should be used to implement a graded approach to the systematic approach to training process. Additional guidance documents for implementation of the systematic approach can be found on the DOE Technical Standards website http://www.hss.doe.gov/nuclearsafety/ns/techstds/standard.html/

Qualification Process

Qualification is defined in terms of education, experience, training, examination, and any special requirements necessary for performance of assigned responsibilities. The requirements in the CRD are intended to provide reasonable assurance that personnel at DOE hazard category 1, 2, and 3 nuclear facilities possess qualifications to operate and maintain the facility safely and reliably under all conditions.

The program leading to qualification must be governed by written procedures that include requirements for documented assessment of the person's qualifications through examinations and performance demonstrations. The contractor must define qualification requirements for personnel in each functional level or area based on the criteria contained in the CRD. The contractor must have a method for formally indicating that a person is qualified and when the qualifications expire.

Certification Process

Certification is the process by which contractor management endorses and documents, in writing, the satisfactory achievement of qualification of a person for a position. Certification follows the completion of the qualification program for those positions identified as requiring certification. The notable difference between certification and qualification is that certification requires official contractor management endorsement of an individual's qualification to ensure senior management involvement in the qualification of key operations positions. Other significant differences between qualification and certification are the requirements associated with continuing training, examination, and reexamination for recertification.

Continuing Training

Continuing training programs must be established to maintain and enhance the knowledge and skills of operating contractor personnel who perform functions associated with engineered safety features as identified in the facility documented safety analysis. The guidance in DOE-HDBK-1118-99, *Guide to Good Practices for Continuing Training*, should be used to develop continuing training programs.

Requalification

Personnel may be requalified by contractor management upon completion of the continuing training program, including requisite examinations. Personnel and their immediate supervisors must not be allowed to continue to function in qualified or certified positions if they have not completed all of the requalification or recertification program elements within the two-year continuing training cycle.

The contractor must indicate by signature that the person has successfully completed the requalification program and is formally requalified.

Medical Examinations

An initial medical examination must be given to certified operator and certified supervisor candidates to verify health and physical fitness to safely perform their assigned tasks. A reexamination must be given to certified operators and certified supervisors at least every two years. Certified operators and certified supervisors must also be cleared by medical examination prior to returning to work following any illness or injury which keeps the person from performing their duties for a period exceeding one month. Medical examination requirements for other operating

contractor personnel must be in accordance with operating contractor procedures.

Records
Contractors must develop and implement administrative procedures that specify requirements for the maintenance of training, qualification, and certification records. Guidance in Nuclear Information and Records Management Association (NIRMA) TG-17, *Guidelines for Management of Nuclear Related Training Records,* TG-15, *Management of Electronic Records,* and TG-21, *Electronic Records Protection and Restoration,* should be used to help standardize identification, handling, and storage of training records.

Chapter II Hazard Category 1, 2, and 3 Nuclear Facility Personnel

Purpose
This chapter contains additional, specific training requirements for positions unique to various types of nuclear facilities such as the specialized training and certification requirements for ROs. These requirements are in addition to the general requirements of chapter I.

Education and Experience Requirements
Education and experience requirements for operating organization personnel are intended to provide reasonable assurance that these personnel have, or can acquire, the knowledge and skills to operate and maintain nuclear facilities and related support systems in a safe and reliable manner under all conditions. Persons at the manager level must meet the requirements shown on tables 1, 2, and 3 prior to assuming the duties of the assigned positions in the tables. These tables identify the minimum education and experience requirements for operating organization positions. Except when noted otherwise, bachelor and associates degrees are in engineering or a related science.

Table 1. Hazard category 2 and 3 nonreactor nuclear facility personnel education and experience requirements

	EDUCATION	**EXPERIENCE**	
	Degree or diploma	Job related	Nuclear
Managers	BS *(1)*	*(8)*	4 year *(2)*
Operations Management	BS	3 year *(8)*	2 year
Supervisors	HS		3 year (3)
Operators	HS		
Technicians		1 year	
Maintenance Personnel		1 year	
Technical Support Personnel	BS	2 year	1 year
Instructional Analyst/Developer	BA*(4)*	1 year	
Training Instructors	HS	*(5)*	*(6,7)*

Table 1 Notes:

(1) The training manager must have a baccalaureate degree. The training manager must have courses in education or training that focus on instructional analysis, design, development, delivery, and testing as well as evaluation of training programs if not included in the baccalaureate course material (baccalaureate need not be in engineering or related science).

(2) Education or experience that is job related may be substituted on a case-by-case basis. The degree may fulfill 3 of the 4 years of nuclear experience on a one-for-one time basis.

(3) Full-time related academic training may be substituted on a one-for-one basis for 2 of the 3 years nuclear experience.

	EDUCATION	EXPERIENCE	
	Degree or diploma	Job related	Nuclear

(4) Instructional analysts/developers should have a baccalaureate degree in training or education. The instructional analyst/developer must have courses in education or training that focus on instructional analysis, design, development, delivery, and testing, as well as evaluation of training programs, if not included in the baccalaureate course material.

(5) Experience consistent with the material being presented.

(6) Instructors who are responsible for instruction on subjects such as technical safety requirements (TSR) must have successfully completed training on facility operating characteristics and principles, and operating limits and their bases, or have had significant involvement in writing the TSRs.

(7) Instructors must have demonstrated knowledge of instructional techniques through basic instructor or equivalent training or experience approved by the training manager. Instructors must have knowledge and/or expertise for the material being presented.

(8) Managers must receive facility-specific training based upon a comparison of the individual's background and abilities with the responsibilities and duties of the position.

Table 2. Hazard category 1/category A
reactor facility personnel education and experience requirements

	EDUCATION		EXPERIENCE		SPECIAL REQMTS
	Degree or diploma	Other	Job related	Nuclear	RO/SRO cert
Managers					
Plant/Facility Manager	BS		*(1)*	6 year *(2,3)*	SRO *(5)*
Operations Manager	BS		*(15)*	4 year *(3,6)*	SRO *(13)*
Maintenance	BS	*(8)*	*(15)*	4 year *(3,6)*	
Technical Manager	BS		*(15)*	4 year *(3,7)*	
Supervisors					
Shift Supervisor	HS			4 year *(6)*	SRO
Senior Reactor Operator	HS		4 year	2 year *(3)*	SRO *(10)*
Qualified Supervisor	HS		4 year	1 year *(4)*	
Technical Support					
Reactor Engineering	BS		4 year *(16)*	2 year *(3,19)*	
Instrumentation and Control	AS		4 year *(16)*	2 year *(3)*	
Chemistry/ Radiochemistry	BS*(22)*		4 year *(16,24)*	2 year *(3)*	
Radiation Protection	BS	*(23)*	4 year *(16)*	3 year *(3)*	
Preoperational Testing Engineer	BS			2 year *(7)*	*(20)*
Startup Testing Engineer	BS			2 year *(7)*	*(20)*
Shift Technical Advisor	BS			1 year *(3)*	*(21)*
Training Organization					
Training Manager	BS/BA *(17)*		4 year *(16)*	2 year	SRO *(9)*
Instructional Analyst/Developer	BA *(14)*		2 year	*(3)*	
Training Instructor	HS		2 year *(11)*		(12)
Operators, Technicians, and Maintenance					
Auxiliary Operator	HS			1 year *(7,3)*	
Reactor Operator	HS			3 year *(3,6,18)*	RO
Technician	HS		3 year		

	EDUCATION		EXPERIENCE		SPECIAL REQMTS
	Degree or diploma	Other	Job related	Nuclear	RO/SRO cert
Maintenance Personnel	Journeyman		3 year		

Table 2 Notes:

(1) Minimum of 4 years of supervisory or management experience.
(2) Three years of nuclear experience may be power plant experience.
(3) Minimum of 6 months onsite.
(4) Minimum of 3 months onsite.
(5) Hold, or have held, a senior reactor operator (SRO) certification for similar hazard category 1/category A reactor plant (or equivalent) or have been certified at an appropriate simulator. Plant managers who have an assistant holding an SRO certification need not meet this special standard.
(6) Two years of nuclear experience may be nuclear/non-nuclear power plant experience.
(7) One year of nuclear experience may be power plant experience.
(8) Must be familiar with nondestructive testing and have an understanding of electrical, pressure vessel, and piping codes and standards.
(9) If the training manager does not hold, or has not held, an SRO certification, another person who holds an SRO certification must be responsible to the training manager for the content and conduct of training for certified operators.
(10) If the candidate for SRO does not possess a baccalaureate in engineering or equivalent, he or she must have 1 year of experience as a certified reactor operator at the reactor for which certification is sought. Candidates for SRO with a baccalaureate in engineering or equivalent must participate in reactor plant operations at power levels of at least 20 percent for at least six weeks and perform all control manipulations that a reactor operator candidate would perform.
(11) Experience must be consistent with the material being presented. Instructors must have demonstrated knowledge of instructional techniques through training or experience and be qualified by the training manager (or equivalent) for the material being presented.
(12) Instructors who provide instruction on the reactor plant simulator to certified personnel must hold, or have held, an SRO certification for a similar hazard category 1/category A reactor plant (or equivalent), or have been certified on the reactor plant simulator. Persons who are responsible for instruction of subjects such as technical safety requirements, reactor operating principles and characteristics, and control manipulations must have received SRO (or equivalent) training.
(13) The operations manager must hold a SRO certification at the time of appointment to the position.
(14) Instructional analysts/developers should have a baccalaureate degree in training or education. The instructional analyst/developer must have courses in education or training that focus on instructional analysis, design, development, delivery, and testing, as well as evaluation of training programs, if not included in the baccalaureate course material.
(15) Minimum of 3 years of supervisory or management experience.
(16) Minimum of 1 year of supervisory or management experience.
(17) The training manager must have a baccalaureate degree. The training manager must have courses in education or training that focus on instructional analysis, design, development, delivery, and testing as well as evaluation of training programs if not included in the baccalaureate course material (baccalaureate need not be in engineering or related science).
(18) Six months of the required experience must be experience as a qualified auxiliary operator at the reactor for which certification is sought.
(19) Nuclear experience must be in areas such as reactor physics, core measurements, core heat transfer, and core physics testing programs.

Table 2 Notes (cont'd):

(20) Must be knowledgeable of test program administration, design and operational performance requirements of the systems and equipment being tested, interaction between systems, and expected plant operational characteristics during the test.
(21) Must be knowledgeable of control room instruments and controls.
(22) Baccalaureate degree must be in chemistry or related science.

	EDUCATION		EXPERIENCE		SPECIAL REQMTS
	Degree or diploma	Other	Job related	Nuclear	RO/SRO cert
(23) Must include formal training in radiation protection. *(24) At least one year of experience must be in radiochemistry.*					

Table 3. Hazard category 2/category B
reactor facility personnel education and experience requirements

	EDUCATION	EXPERIENCE		SPECIAL REQMTS
	Degree or diploma	Job related	Nuclear	RO/SRO cert
Managers	BS *(1)*	*(8)*	6 year *(2,3)*	
Supervisors	HS		3 year *(3,9)*	SRO
Senior Reactor Operator	HS		3 year *(3)*	SRO
Reactor Operator	HS			RO
Technician		1 year		
Maintenance Personnel		1 year		
Technical Support	BS	2 year	1 year	
Instructional Analyst/Developer	BA (*4)*	2 year		
Training Instructor	HS	*(5)*		*(6,7)*

Table 3 Notes:

(1) The training manager must have a baccalaureate degree. The training manager must have courses in education or training that focus on instructional analysis, design, development, delivery, and testing as well as evaluation of training programs if not included in the baccalaureate course material (baccalaureate need not be in engineering or related science).

(2) Education or experience that is job related may be substituted on a case-by-case basis. The degree may fulfill 4 of the 6 years of nuclear experience on a one-for-one time basis.

(3) Experience acquired at nuclear power, test, research, or production reactors or a critical facility counts on a one-for-one time basis.

(4) Instructional analysts/developers should have a baccalaureate degree in training or education. The instructional analyst/developer must have courses in education or training that focus on instructional analysis, design, development, delivery, and testing, as well as evaluation of training programs, if not included in the baccalaureate course material.

(5) Experience consistent with the material being presented.

(6) Instructors who are responsible for instruction of subjects such as TSRs, reactor operating principles and characteristics, and control manipulations must have received SRO (or equivalent) training.

(7) Instructors must have demonstrated knowledge of instructional techniques through training or experience and be qualified by the training manager (or equivalent) for the material being presented.

(8) Managers must receive some facility-specific training based upon a comparison of the individual's background and abilities within the responsibilities and duties of the position.

(9) Full time academic training may be substituted on a one-for-one basis for 2 of the 3 years of required nuclear experience.

Control Manipulation Requirements for Certified Positions

The operating contractor must prepare a list of control manipulations for certified positions in reactor and non-reactor nuclear facilities. The following are additional requirements for hazard category 1/category A and hazard category 2/category B reactors.

- The list of control manipulations must specify which manipulations are to be performed annually and which are to be performed biennially by ROs and SROs.

- Reactor operator and SRO candidates must perform a minimum of five significant reactivity manipulations for initial certification. Additional control manipulations should be based on the analysis.

Operational Evaluation Requirements
The operational evaluations administered to certified operator, RO, SRO, fissionable material handler, and certified supervisor candidates must be generally similar in scope. The evaluation must contain questions and operational exercises and must include a facility walkthrough, and may include system and/or component operation.

Certified Operator, Fissionable Materials Handler, and Supervisor Proficiency Requirements
These positions must actively perform job functions associated with their certification to maintain proficiency. Actively performing job functions associated with certification means that the certified individual has a position on the shift crew and that the individual carries out and is responsible for the day-to-day duties of the certified position. If active status is not maintained, certification must be suspended and the person must not be assigned certification duties until the requirements of section 5.a. and/or 5.b. of DOE O 426.2 have been met, as appropriate.

Non-Reactor Nuclear Facility Specific Requirements
Operator training must be sufficiently comprehensive to cover areas which are fundamental to the candidate's assigned tasks to ensure that personnel are capable of safely performing their job duties.

Fissionable material handler candidates must be trained in subject areas specified in section 6.a. of DOE O 426.2 in addition to the training for operators, to the extent applicable to the position.

The supervisor training program must include the subject categories and on-the-job training specified for operators and fissionable material handlers to the extent to which they are applicable. This training must be of increased depth to reflect the added responsibility of the supervisor position.

Operations management personnel must be qualified. They must be provided with training on process knowledge to demonstrate operational knowledge of applicable facilities/processes, and must satisfactorily complete training on applicable facility/process safety basis documents.

Written examinations must be administered to certified operator candidates and other positions that have been designated as certified. These examinations must contain a representative selection of questions on the knowledge and skills identified from learning objectives developed from the analysis of the job and from other applicable sources.

Hazard Category 2/Category B Reactor Specific Requirements
The qualification program for ROs and SROs must include classroom-type and on-the-job training to ensure familiarity with all required aspects of reactor operation, including anticipated transients and accident conditions.

All fuel handling operations must be performed by or under the direct supervision of a person certified to perform the required functions. The requirements specified in section 7.b. of DOE O 426.2 are not necessary if fuel handling is performed by persons trained for such as part of RO and SRO certification programs.

Written examinations must be administered to all RO candidates, and must contain a representative selection of questions on the knowledge and skills identified from learning objectives developed from the analysis of the job and from other applicable sources. In addition, these examinations must include a representative sampling from items specified in section 7.c. of DOE O 426.2, as appropriate to the position and to the facility.

Written examinations must be administered to all SRO candidates based on the same sources as the RO written examinations, and must include a representative sampling from items specified in section 7.d. of DOE O 426.2, in addition to those required for ROs, as appropriate to the position and to the facility.

Hazard Category 1/Category A Reactor Specific Requirements
The contractor must ensure that the operating shift possesses adequate engineering and accident assessment expertise. This may be accomplished by designating a shift technical advisor (STA) for each shift, or by combining the STA position with the shift supervisor or an on-shift SRO.

DOE production reactors must have a full-scope simulator that meets the requirements contained in ANSI/ANS 3.5-1998, *Nuclear Power Plant Simulators for Use in Operator Training*, and regulatory guide positions 1.3 and 1.4 contained in Nuclear Regulatory Commission Regulatory Guide 1.149, Revision 3, of October 2001, *Nuclear Power Plant Simulation Facilities for Use in Operator Licenses and License Examinations*, for RO and SRO training.

Shift technical advisor training must include accidents analyzed in the facility DSA and the consequences of these accidents; the duties, responsibilities, and authorities of the STA; and other items specified in section 8.c. of DOE O 426.2.

All fuel handling operations must be performed by or under the direct supervision of a person certified to perform the required functions. The requirements specified in section 8.d. of DOE O 426.2 are not necessary if fuel handling is performed by persons trained for such as part of RO and SRO certification programs.

Written examinations must be administered to all RO candidates, and must contain a representative selection of questions on the knowledge and skills identified from learning objectives developed from the analysis of the job and from other applicable sources. In addition, these examinations must include a representative sampling from items specified in section 8.e. of DOE O 426.2, as appropriate to the position and to the facility.

Written examinations must be administered to all SRO candidates based on the same sources as the RO written examinations, and must include a representative sampling from items specified in section 8.f. of DOE O 426.2, in addition to those required for ROs, as appropriate to the position

and to the facility.

During operating crew/shift training, RO and SRO candidates must be assigned to an operating crew full-time for a minimum of 3 months shift training with no concurrent duties that are not related to the operation of the facility. During this period, under the observation and control of a certified RO or SRO respectively, the RO or SRO trainee must manipulate the facility controls and perform the same duties as a certified RO or SRO as applicable.

Note: You do not have to do example 2 on the following page, but it is a good time to check your skill or knowledge of the information covered. You may do example 2 or go directly to the practice.

EXAMPLE 2

Using the familiar level of this module and the resources, answer the following questions.

1. What is the notable difference between certification and qualification?

2. Who prepares the training implementation matrix and what is the purpose of that matrix?

3. Under what condition are the additional fuel handling requirements specified in DOE O 426.2 unnecessary?

4. What are the consequences for personnel and their immediate supervisors who have not completed all of the requalification or recertification program elements within the continuing training cycle specified in DOE O 426.2?

5. What is the length of the continuing training cycle specified in DOE O 426.2?
   Two years

6. What does the phrase "actively performing job functions" mean, when associated with certification?

Note: When you are finished, compare your answers to those contained in the example 2 self-check. When you are satisfied with your answers, go on to the practice in this module.

EXAMPLE 2 SELF-CHECK

1. What is the notable difference between certification and qualification?

   The notable difference between certification and qualification is that certification requires official contractor management endorsement of an individual's qualification to ensure senior management involvement in the qualification of key operations positions.

2. Who prepares the training implementation matrix and what is the purpose of that matrix?

   The contractor must prepare a training implementation matrix (TIM) to identify those sections of the contractor requirements document that are applicable to a particular facility. The TIM defines and describes the application of the selection, qualification, certification, and training requirements. It must clearly define the organization, planning, and administration of the program and set forth the responsibility, authority, and methods for conducting training.

3. Under what condition are the additional fuel handling requirements specified in DOE O 426.2 unnecessary?

   The additional fuel handling requirements specified in DOE O 426.2 are unnecessary if fuel handling is performed by persons trained for such as part of reactor operator and senior reactor operator certification programs.

4. What are the consequences for personnel and their immediate supervisors who have not completed all of the requalification or recertification program elements within the continuing training cycle specified in DOE O 426.2?

   Personnel and their immediate supervisors who have not completed all of the requalification or recertification program elements within the specified continuing training cycle must not be allowed to continue to function in qualified or certified positions.

5. What is the length of the continuing training cycle specified in DOE O 426.2?
   Two years

6. What does the phrase "actively performing job functions" mean, when associated with certification?

   When associated with certification, the phrase "actively performing job functions" means that the certified individual has a position on the shift crew and that the individual carries out and is responsible for the day-to-day duties of the certified position.

PRACTICE

This practice is required if your proficiency is to be verified at the familiar level. This practice will prepare you for the criterion test. You will need to refer to the Order and resources to answer the questions in the practice correctly. The practice and criterion tests will also challenge additional analytical skills that you have acquired in other formal and on-the-job training.

1. Which DOE facilities are required to implement DOE O 426.2?

2. What methodology must be used to evaluate DOE contractor training?

3. What process must be used to establish a training program for operations, maintenance, and technical staff personnel, and what are the basic elements of that process?

4. What is the minimum number of significant reactivity manipulations that reactor operator and senior reactor operator candidates must perform for initial certification?

5. What is the minimum length of time that reactor operator and senior reactor operator candidates at hazard category 1/category A reactors must be assigned to an operating crew full-time?
    a. One month
    b. Two months
    c. Three months
    d. Four months

6. What are the requirements for operator training at non-nuclear facilities?

7. What are the qualification program requirements for reactor operators and senior reactor operators specific to hazard category 2/category B reactors?

8. Training for what position must include accidents analyzed in the facility documented safety analysis and the consequences of these accidents; and the duties, responsibilities, and authorities of the position?
    a. Fissionable material handler
    b. Shift technical advisor
    c. Senior reactor operator
    d. Operations manager

Note: The course manager will check your practice and verify your success at the familiar level. When you have successfully completed this practice, go to the general level module.

DOE O 426.2
PERSONNEL SELECTION, TRAINING, QUALIFICATION, AND CERTIFICATION REQUIREMENTS FOR DOE NUCLEAR FACILITIES
GENERAL LEVEL

OBJECTIVES

Given the familiar level of this module, a scenario, and an analysis, you will be able to answer the following questions:

1. What are the key elements you would look for in the contractor's action plan to correct the situation described in the scenario?
2. Which requirements, sections or elements of DOE O 426.2 apply to the situation described in the scenario?

Note: If you think that you can complete the practice at the end of this level without working through the instructional material and/or the examples, complete the practice now. The course manager will check your work. You will need to complete the practice in this level successfully before taking the criterion test.

RESOURCES

DOE Orders Self-Study Program, DOE O 426.2, Familiar Level, June 2011.
10 CFR 55, "Operators' Licenses." January 1, 2011.
10 CFR 830.122, "Criteria 2—Management/Personnel Training and Qualification." January 1, 2011.
ANSI/ANS 3.1-1993, *American National Standard, Selection, Qualification and Training of Personnel for Nuclear Power Plants.*
ANSI/ANS 15.4-2007, *American National Standard, Selection and Training of Personnel for Research Reactors*.
DOE O 426.2, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities*. April 21, 2010.
DOE-STD-1070-94, *Guidelines for Evaluation of Nuclear Facility Training Programs*. June 1994.
DOE-HDBK-1074-95, *Alternative Systematic Approaches to Training*. August 1994.
DOE-HDBK-1078-94, *Training Program Handbook: A Systematic Approach to Training.* January 1995.
DOE-HDBK-1118-99, *Guide to Good Practices for Continuing Training*. October 1999.
NIRMA TG-15, *Management of Electronic Records.* 1998.
NIRMA TG-17, *Guidelines for Management of Nuclear Related Training Records.* 1998.
NIRMA TG-21, *Electronic Records Protection and Restoration.* 1998.

INTRODUCTION

The familiar level of this module introduced the purpose of DOE O 426.2 and the DOE directives and consensus standards that support DOE O 426.2. Several requirements and guidelines associated with DOE O 426.2 were discussed. In the general level of this module, students are asked to apply the information contained in the familiar level and the Order to some scenarios depicting work situations related to the Order. Each scenario includes a situation, the actions taken to remedy the situation, and the requirements related to the situation. Students will be asked to review the contractor's actions and decide if they are correct. Please refer to the resources listed on the previous page to make your analysis and answer the questions. You are not required to complete the example. However, doing so will help prepare you for the practice and criterion test.

Note: You do not have to do the example on the following page, but it is a good time to check your skill and knowledge of the information covered. You may do the example or go on to the practice.

EXAMPLE SCENARIO

Please review the following scenario, and then answer these questions.

1. Were the actions taken appropriate? If not, what do you think should have been done? If so, what additional action(s), if any, do you think should have been taken?
2. Were the correct DOE O 426.2 requirements cited regarding the situation? If not, what are the correct requirements?

On March 4, a maintenance employee obtained the key to a waste drum from a key custodian. The maintenance employee placed improperly packaged waste material into the drum, and relocked the drum. It was later determined that the maintenance employee did not have current waste generator qualifications on file. This was considered a procedural violation, as personnel involved in waste disposal are required by waste operations procedures to be waste generator qualified.

An investigation of the situation revealed the following:

- Waste operations procedures state that waste packaging personnel must have current waste generator qualifications and that the maintenance employee's qualifications had expired.
- A formal list of qualified individuals did not exist. This meant that there was no way for the shift manager to verify if the maintenance employee was waste generator qualified. Additionally, there was no mechanism for key custodians to identify if someone was waste generator qualified.

Immediate actions:

- The building shift manager assigned properly qualified waste generator personnel to repackage the material in the drum.

Other actions:

- Training personnel developed and issued a list of qualified waste generators. Shift managers maintain the list in their office and use it to determine if individuals are waste generator qualified when making work assignments.
- Training personnel developed and maintain a list of current waste generator qualification packages and a list of qualified personnel. They distribute these lists monthly to support personnel to assist them in ensuring that individuals assigned to specific jobs are waste generator qualified.

Applicable requirements:

The purpose of DOE O 426.2 is establish selection, training, qualification, and certification requirements for contractor personnel who can impact the safety basis through their involvement in the operation, maintenance, and technical support of hazard category 1, 2, and 3 nuclear facilities.

- The qualification requirements for maintenance personnel are provided in attachment 1, sections 5.a. and 5.d.

The requalification requirements for maintenance personnel are provided in attachment 1, section 8.a.-c., as applicable.

Write your answers on the next page.

Note: When you are finished, compare your answers to those contained in the example self-check. When you are satisfied with your answers, go on to the practice.

EXAMPLE SELF-CHECK

Your answers do not have to match the following exactly. You may have included additional actions or cited other requirements. To be considered correct, your answers must include at least the following.

Yes, the listed actions were appropriate but incomplete. The following additional action should have been taken.

- Training personnel developed waste generator cards that show the qualification periods and issued them to qualified personnel. Key custodians can use the cards to verify that personnel who disposition and generate waste are currently qualified.

The proper requirements of DOE O 426.2 are cited. One additional requirement should have been included.

- Training department personnel must establish a training program for operations, maintenance, and technical staff personnel utilizing the systematic approach to training process as described in attachment 1, chapter I, section 4.a. of DOE O 426.2.

PRACTICE

This practice is required if your proficiency is to be verified at the general level. The practice will prepare you for the criterion test. You will need to refer to DOE O 426.2, DOE directives and consensus standards to answer the scenario questions in the practice correctly. The practice and criterion tests will also challenge additional analytical skills that you have acquired in other formal and on-the-job training.

SCENARIO

Please review the following scenario and then answer these questions.

1. Were the actions taken appropriate? If not, what do you think should have been done? If so, what additional action(s), if any, do you think should have been taken?
2. Were the correct DOE O 426.2 requirements cited regarding the situation? If not, what are the correct requirements?

During troubleshooting of wet air pumps to determine the cause of high pump operating temperatures, approximately 50 gallons of potentially hazardous material were discharged into a storm drain from a category B reactor facility. The hazardous material content of the discharge was below reportable limits.

An investigation of the situation revealed the following:

- An operator violated a procedure regarding valve position.
- The valve in question contained no cautionary tag, label, or seal to prevent a discharge into the storm drain.
- The operator was not qualified to perform this job.

Immediate actions:

- Review applicable procedures.
- Examine other wet air pumps for cautionary tags, labels, and/or seals.

Additional actions:

- Install cautionary tags, labels, and/or seals to prevent operation of the valve and discharge into the storm drain.
- The training department will review the incident and incorporate lessons learned into operator training, with an emphasis on the impact of abnormal situations.

Applicable requirements:

- DOE O 426.2, attachment 1, chapter II, section 6.a.

Write your answers on the next page and then bring the completed practice to the course manager for review.

Note: The course manager will check your practice and verify your success at the general level. When you have successfully completed this practice, the course manager will give you the criterion test.