

# U.S. DEPARTMENT OF ENERGY

## DEPARTMENT-WIDE

# FUNCTIONAL AREA QUALIFICATION STANDARD

## TECHNICAL TRAINING

## QUALIFICATION STANDARD COMPETENCIES

### Defense Nuclear Facilities Technical Personnel

May 1995

#### 1. GENERAL TECHNICAL

**1.1 Technical training personnel shall demonstrate a working level knowledge of the systematic approach to training process.**

Supporting Knowledge and/or Skills

- a. State the five steps of the systematic approach to training process and produce a basic sketch showing the relationship between the steps.
- b. Describe in general terms the activities that occur in each of the five steps of the systematic approach to training process, and list the products that may result from each of the steps.
- c. Describe the purpose and process for conducting a needs analysis, job analysis and task analysis.
- d. Describe the functional relationship between tasks, learning objectives, training materials, and trainee evaluations.
- e. State and describe the components of an internal training program evaluation process to assess the effectiveness of training.

**1.2 Technical training personnel shall demonstrate a working level knowledge of training program organization, administration and infrastructure.**

Supporting Knowledge and/or Skills

- a. State and discuss some of the attributes of an efficient and effective technical training organization a defense nuclear facility.
- b. State and discuss the advantages and the disadvantages of centralized and decentralized training organizations.

- c. Explain the purpose of a training policy and procedure manual and discuss the typical policies and procedures that may be found in this manual.
- d. Describe the roles and responsibilities of line management, the training organization, and the employee as related to training and qualification.
- e. Explain how to utilize facilities, equipment and materials in an efficient manner to implement the training process.
- f. Describe the purpose and attributes of a technical training resource library.

**1.3 Technical training personnel shall demonstrate the ability to plan, conduct, and document a training needs assessment or job analysis of a position(s) to determine the training requirements associated with that position.**

Supporting Knowledge and/or Skills

- a. Identify the position(s) to be assessed.
- b. Gather appropriate reference and resource materials related to the position.
- c. Interview subject matter expert(s) and supervisors associated with the position to determine the duties and responsibilities in terms of tasks and/or competencies.
- d. Determine the knowledge, skills and abilities (or specific training) required to support the identified duties and responsibilities.
- e. Validate the results of the needs assessment with other subject matter experts and/or the responsible supervisor.

**1.4 Technical training personnel shall demonstrate a working level knowledge of training course and/or program design techniques and methodologies.**

Supporting Knowledge and/or Skills

- a. Define the term entry-level requirements, describe how they are established, and how they influence the training program and/or course design.
- b. State the difference between terminal learning objectives and enabling learning objectives.
- c. Describe the attributes of a well-written learning objective, and discuss when implied conditions and standards are sufficient.
- d. Explain how learning objectives are developed and validated to ensure technical adequacy and accuracy.
- e. Explain how and why learning objectives are sequenced.
- f. Describe the process for grouping and sequencing objectives when developing a training course or a training program.
- g. List the various training settings that may be selected when designing a training curriculum, and state the

advantages and disadvantages of each one.

**1.5 Technical training personnel shall demonstrate the ability to design a training course or curriculum to satisfy the training requirements identified by a needs assessment, job analysis, or other regulations or requirements.**

Supporting Knowledge and/or Skills

- a. Using the results of a training needs assessment or job analysis, develop learning objectives to reflect the required knowledge and skills.
- b. Group and sequence the learning objectives as necessary to ensure adequate structure and flow of the instruction.
- c. Develop an outline and/or lesson plans to document the content of the instruction required to support the learning objectives.
- d. Select the proper training setting(s) to support the instruction.
- e. Validate that the training content adequately supports the learning objectives and the identified duties and responsibilities for which the training is provided.

**1.6 Technical training personnel shall demonstrate a working level knowledge of the process, techniques and methodology associated with training material development.**

Supporting Knowledge and/or Skills

- a. Explain why formal and documented training materials are necessary in a formal, systematic approach to training process.
- b. Explain the relationship between learning objectives, training materials, and the presentation of instruction.
- c. Describe the attributes, content and format of a typical, well-written classroom lesson plan.
- d. Describe the attributes, content and format of a typical, well-written laboratory training guide.
- e. Describe the attributes, content and format of a typical, well-written on-the-job training guide.
- f. Describe the attributes, content and format of a typical, well-written self-study training guide.
- g. Explain the use and development of instructional media to support training guides and lesson plans.

**1.7 Technical training personnel shall demonstrate the ability to develop training materials to support the presentation of classroom, OJT, self-study, or laboratory training.**

Supporting Knowledge and/or Skills

- a. Determine the purpose and scope of the training presentation.
- b. Develop the lesson plan or training guide to support the identified skills and knowledge required by the

trainees.

- c. Develop the supporting media and materials such as overhead slides, student handouts, flip-charts, etc.
- d. Validate the adequacy and accuracy of the materials through review and approval by subject matter experts.

**1.8 Technical training personnel shall demonstrate a working level knowledge of adult learning methodologies and instructor techniques required to conduct a training session or evaluate the effectiveness of classroom training sessions.**

Supporting Knowledge and/or Skills

- a. State and discuss the factors which are under an instructor's control that affect learning during classroom instruction, including a discussion of dealing with difficult trainees.
- b. Describe the attributes of an effective classroom learning environment.
- c. Compare and contrast various classroom instructional methodologies including lecture, role-play, case studies, discussions, and practical classroom demonstrations.
- d. Describe the attributes of an effective classroom instructor including use of training and media materials, effective speaking, questioning techniques, and subject matter expertise.
- e. List and discuss the key elements and components of a valid and reliable testing program to evaluate trainee knowledge during, or upon completion of classroom training.

**1.9 Technical training personnel shall demonstrate the ability to conduct a classroom training session or make a formal presentation to a group of personnel.**

Supporting Knowledge and/or Skills

- a. Gather or develop the instructional materials that will be used for the presentation.
- b. Adequately prepare for the session.
- c. Ensure that the facilities adequately support the training environment.
- d. Present the materials using proper instructional techniques.
- e. Evaluate trainee retention of the material as applicable.
- f. Obtain feedback from the trainees on the adequacy and applicability of the presentation.

**1.10 Technical training personnel shall demonstrate a working level knowledge of on-the-job training (OJT) techniques, methodology and implementation and apply that knowledge to implement and/or evaluate OJT programs in the field.**

Supporting Knowledge and/or Skills

- a. List and discuss the potential advantages and disadvantages associated with implementing an on-the-job

training program.

- b. State and describe the roles and responsibilities of the training organization and line management to ensure effective implementation of an OJT program.
- c. Discuss the differences between formal and informal OJT.
- d. Describe the role of the trainer, the evaluator, and the trainee in the OJT process.
- e. List and discuss the process steps that OJT instructors use to help trainees learn on the job.
- f. Describe the format and content of a typical OJT training guide and job performance measure (JPM) or evaluation standard, including a discussion of the essential elements of each.
- g. List and discuss the key elements and components of a valid and reliable practical evaluation process for evaluating trainee knowledge and skill upon completion of OJT.

**1.11 Technical training personnel shall demonstrate a working level knowledge of the evaluation phase of the Systematic Approach to Training process.**

Supporting Knowledge and/or Skills

- a. Describe the major activities that take place during the evaluation phase, including a discussion of the four levels of evaluation.
- b. List the indicators of training system/program performance and changing training needs that should be monitored.
- c. Describe the content and structure of evaluation instruments (forms) used to collect evaluation data at each of the four levels.
- d. Describe the process by which information collected during the evaluation phase is analyzed.
- e. Describe how training courses and/or programs may be modified based upon the results of each of the four levels of evaluation.

**1.12 Technical training personnel shall demonstrate a working level knowledge of oral, written, and performance evaluation techniques and methodologies.**

Supporting Knowledge and/or Skills

- a. Explain the purpose of testing and why tests should be based upon learning objectives.
- b. List and describe the different types of written test item formats that may be utilized, and discuss the advantages and disadvantages of each.
- c. Describe the key elements of an adequate oral evaluation process, and discuss the advantages and disadvantages of this method of evaluation.
- d. Describe the key elements of an adequate performance evaluation or operational evaluation process, and discuss the advantages and disadvantages of this method of evaluation.

- e. Explain how test item statistics are utilized to evaluate the quality (validity and reliability) of test items and the learning objectives or training on which they are based.
- f. Describe the purpose and use of examination banks.

**1.13 Technical training personnel shall demonstrate a working level knowledge of the requirements and attributes associated with an effective records management system.**

Supporting Knowledge and/or Skills

- a. Describe the difference between individual training records and program training records.
- b. Describe the difference between training records and qualification records.
- c. List and discuss the items that would typically be found in an individual training record.
- d. List and discuss the items that would typically be found in a training program record.
- e. List and discuss the items that would typically be found in a qualification record.
- f. Explain the legal aspects associated with accessing individual training and qualification records.
- g. Describe the difference between an archival records system and a dynamic record retrieval system.

**2. REGULATORY**

**2.1 Technical training personnel shall demonstrate a working level knowledge of the requirements of DOE Order 5480.20 (or its associated rule) to determine if a contractor at a facility is meeting the intent of the Order.**

Supporting Knowledge and/or Skills

- a. Describe the purpose, applicability, and roles and responsibilities sections as they appear in the Order.
- b. Using DOE Order 5480.20 as a reference, describe the general requirements placed upon a management and operating contractor at Category 1, 2, and 3 facilities in the following areas:
- Qualification and certification of facility personnel
  - Training and qualification of sub-contractors
  - General employee training and unescorted access requirements
  - Continuing training and requalification
  - Exceptions and alternatives to requirements of the Order
  - Personnel selection
  - Training and qualification record requirements
- c. Using DOE Order 5480.20 as a reference, state the entry level requirements for various facility positions.

**2.2 Technical training personnel shall demonstrate a familiarity level knowledge of the DOE training program accreditation process and DOE Order 5480.18 to determine if an operating contractor is implementing the requirements of the Order in an effective and efficient manner.**

## Supporting Knowledge and/or Skills

- a. Explain the purpose, applicability, and roles and responsibilities sections as they appear in the Order.
- b. List and describe the steps that occur in the accreditation process.
- c. Using the Training Accreditation Program (TAP) manuals as a reference, explain the purpose and applicability of the accreditation objectives and criteria.
- d. State and discuss the requirements and process associated with the renewal of training program accreditation.

### **2.3 Technical training personnel shall demonstrate a familiarity level knowledge of the training and qualification requirements in the following DOE Orders (or associated rules) sufficient to evaluate the applicability and implementation of the requirements at a facility.**

- DOE Order 5480.19 "Conduct of Operations"
- DOE Order 4330.4 "Maintenance Management"
- DOE Order 5500.1 "Emergency Management System"
- DOE Order 5700.6 "Quality Assurance"
- DOE Radiological Controls Manual

## Supporting Knowledge and/or Skills

- a. Using the above listed Orders and Standards as a reference, state and describe the training and qualification requirements contained in each of them.
- b. Using the above listed Orders and Standards as a reference, describe the role of the technical training personnel in evaluating or implementing the training and/or qualification requirements.
- c. Describe the interrelationship of the training requirements listed in the various DOE Orders (or associated rules), including DOE Order 5480.20.
- d. Describe the process for determining adequate compliance with the requirements listed in the above Orders, and the severity and consequences associated with not being in compliance.

### **2.4 Technical training personnel shall demonstrate a working level knowledge of DOE Order 3410 sufficient to ensure that training programs for Federal personnel are accomplished in accordance with the requirements of the Order.**

- a. Discuss the duties and responsibilities of line management, Headquarters personnel and training support personnel as indicated in the Order.
- b. Explain the latitude and restrictions associated with employee training as stated in the Order.
- c. Describe the planning and evaluating requirements stated in the Order including:
  - Identification of training needs and priorities
  - Annual training plans
  - Long-term training
  - Individual development plans (IDPs)

- Retraining of Federal employees
- Evaluation of training

d Explain the requirements associated with requesting and utilizing training resources as described in the Order.

e. State the purpose and requirements associated with establishing Agreements to Continue in Service with employees prior to approving training expenditures.

f. Describe the training forms, records and reports listed in the Order.

**2.5 Technical training personnel shall demonstrate a working level knowledge of DOE Standard 1070-94, Guidelines for Evaluation of Nuclear Facility Training Programs.**

Supporting Knowledge and/or Skills

a. State and describe the purpose and applicability of the standard.

b. Describe the evaluation process indicated in the standard including evaluation methods, evaluation frequency, and the application of a graded approach.

c. Explain the application of the objectives and criteria.

d. Explain the process indicated in the standard for reporting and tracking evaluation results.

e. Using the standard as a reference, describe and discuss the purpose, scope, and applicability of the objectives and criteria.

**2.6 Technical training personnel shall demonstrate a familiarity level knowledge of the content and applicability of the DOE Guides to Good Practice related to training.**

Supporting Knowledge and/or Skills

a. Describe the general content of the DOE Guides to Good Practice such as those listed below, and explain the use and applicability.

- DOE-STD-1005-92, Guide to Good Practices for Developing Learning Objectives
- DOE-STD-1006-92, Guide to Good Practices: Evaluation Instrument Samples
- DOE-STD-1007-92, Guide to Good Practices For Teamwork Training and Diagnostics Skills Development
- DOE-STD-1008-92, Guide to Good Practices for Training of Technical Staff and Managers
- DOE-STD-1009-92, Guide to Good Practices for the Development of Test Items
- DOE-STD-1010-92, Guide to Good Practices for Incorporating Operating Experiences
- DOE-STD-1011-92, Guide to Good Practices for Design, Development, and Implementation of Examinations
- DOE-STD-1012-92, Guide to Good Practices for On-the-Job Training
- DOE-STD-1058-93, Guide to Good Practices for Developing and Conducting Case Studies
- DOE-STD-1056-93, Guide to Good Practices for Line and Training Manager Activities Related to Training
- DOE-STD-1060-93, Guide to Good Practices for Continuing Training

### 3. ADMINISTRATIVE

#### **3.1 Technical training personnel shall demonstrate a working level knowledge of contracts and procurement processes and procedures; and how they apply to procurement of training-related services or products.**

##### Supporting Knowledge and/or Skills

- a. Describe the process and requirements for paying for individual training courses as described in DOE Order 3410.
- b. Explain how procurement requests are generated and approved for training services.
- c. State and discuss the requirements and limitations associated with open competition for services and products.
- d. Describe the process for developing a scope of work, request for proposal, and evaluation criteria to determine the best source or provider of training services or products.
- e. Describe the requirements and process for using existing government sources for training services and products including:
  - Management and operating contractors
  - Support services contractors
  - Other government agencies
  - Local schools and universities
- f. Describe the roles and responsibilities of the Contracting Officer Representative and explain the relationship between the Contracting Officer Representative, the Contracting Officer, and the Contractor.

### 4. MANAGEMENT, INSPECTION, AND OVERSIGHT

#### **4.1 Technical Training personnel shall demonstrate a familiarity level of knowledge of project management practices sufficient to manage training-related programs and projects.**

##### Supporting Knowledge and/or Skills

- a. Explain the purpose of project management and, describe the life cycle of a typical project.
- b. Describe typical documents and data sources utilized in project management.
- c. Identify and explain the major elements of a project, and discuss their relationship.
- d. Explain the purpose and use of a project management plan.
- e. Discuss the relationship between work breakdown structure (WBS) and cost and schedule.
- f. Describe the purpose of schedules, and discuss the use of milestones and activities.
- g. Describe the critical path method of scheduling.

**4.2 Technical training personnel shall demonstrate a working level knowledge of basic assessment principles associated with evaluating DOE contractors including the planning and use of observations, interviews, personnel interfaces, and document reviews to assess compliance with established criteria or requirements.**

Supporting Knowledge and/or Skills

- a. Describe the role of the evaluator with respect to performance of oversight of management and operating (M&O) contractors at government-owned, contractor operated (GOCO) facilities.
- b. Describe the requirements and limitations associated with the evaluator's interface with contractor employees when conducting assessments or evaluations.
- c. Describe the DOE Cost Plus Award Fee (CPAF) process and other fee-based contracts, and explain the relationship of assessments and evaluations to those contracts.
- d. Explain the impact of the Price-Anderson Act and how the performance of evaluations or assessments relates to the requirements associated with that act, including enforcement aspects of 10 CFR830.120.
- e. Explain the essential elements of a performance-based assessment including the areas of investigation, fact-finding, and reporting.
- f. Explain the purpose and contents of a typical assessment report, and describe how to determine who should be on the distribution list for the report.
- g. Explain the essential elements and process associated with the following assessment activities:
  - One-on-one interviews
  - Entrance and exit meetings
  - Corrective action implementation
  - Closure process
- h. Describe the actions to be taken if the contractor challenges the assessment findings and explain how such challenges can be avoided.

**4.3 Technical training personnel shall demonstrate the ability to plan, conduct and document an evaluation of a technical training and qualification program activity (e.g., monitor an oral examination, evaluate an OJT session, review the content of a training course).**

Supporting Knowledge and/or Skills

- a. Establish the criteria to be used as a basis for conducting the evaluation.
- b. Develop a checklist or guidesheet to assist in performing and documenting the evaluation or the activity.
- c. Evaluate the activity.
- d. Document the results of the evaluation using a performance checklist or surveillance guidesheet.
- e. Report the results of the evaluation to facility management and DOE management as appropriate.

**4.4 Technical training personnel shall demonstrate the ability to plan, conduct and document an overall evaluation of a technical training and qualification program and report those results to management in a concise and effective manner.**

Supporting Knowledge and/or Skills

- a. Establish the criteria to be used as a basis for conducting the evaluation.
- b. Establish points of contact with the organization being evaluated.
- c. Gather information pertinent to the evaluation by reviewing training materials, interviewing personnel, observing training activities and reviewing training records.
- d. Document the results of the data collection phase in field notes.
- e. Compare the results of the review phase with the criteria established for the evaluation and determine if deficiencies exist.
- f. Document the results of the overall training and qualification evaluation in a formal written report which includes the status of meeting the established criteria, identifies deficiencies or good practices, and suggests recommendations for improvement.
- g. Resolve conflicting or inconclusive observations or findings obtained from other evaluators on an evaluation team.
- h. Verbally report the results of the evaluation to contractor facility management and DOE management.
- i. Perform follow-up activities as applicable to ensure implementation of corrective actions, including tracking and close-out.

**EVALUATION REQUIREMENTS**

The following requirements shall be met to complete the Department-wide Technical Training Functional Area Qualification Standard. The evaluation process identified below serves as a measurement tool for assessing whether the participants have acquired the technical competencies outlined in this Standard.

1. Documented completion of the Department-wide General Technical Base Qualification Standard competencies in accordance with the requirements contained in that Standard.
2. Satisfy the Technical Training competencies listed in this qualification standard. Documenting that these competencies have been met may be accomplished by a qualifying official using any of the following methods:
  - Documented evaluation of formal equivalencies
  - Written examination
  - Documented oral evaluation
  - Documented observation of performance.

**CONTINUING TRAINING AND PROFICIENCY REQUIREMENTS**

Technical Training personnel shall participate in an Office/facility/position-specific continuing training and qualification program that includes the following elements:

1. Continuing technical training and/or education covering topics directly related to the duties and responsibilities of the position as indicated in this Standard; or training covering topics that address identified deficiencies in the knowledge and/or skill of personnel as determined by management. This may include courses and/or training provided by:

- Department of Energy
- Other government agencies
- Outside vendors
- Educational institutions

2. Performance of the duties and responsibilities of a technical training professional within the Department of Energy on a regular basis.