

U.S. DEPARTMENT OF ENERGY
DEPARTMENT-WIDE
FUNCTIONAL AREA QUALIFICATION STANDARD

FACILITY MAINTENANCE MANAGEMENT FUNCTIONAL AREA QUALIFICATION STANDARD

DOE Defense Nuclear Facilities Technical Personnel

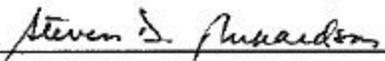


**U.S. Department of Energy
Washington, D.C. 20585**

February 2000

APPROVAL

The Federal Technical Capability Panel consists of senior Department of Energy managers responsible for overseeing the Federal Technical Capability Program. This Panel is responsible for reviewing and approving the Qualification Standard for Department-wide application. Approval of this Qualification Standard by the Federal Technical Capability Panel is indicated by signature below.



S.D. Richardson, Chair
Federal Technical Capability Panel

CONTENTS

ACKNOWLEDGMENT iii

PURPOSE 1

APPLICABILITY 1

IMPLEMENTATION 2

EVALUATION REQUIREMENTS 3

CONTINUING EDUCATION, TRAINING AND PROFICIENCY 3

DUTIES AND RESPONSIBILITIES 4

BACKGROUND AND EXPERIENCE 4

REQUIRED TRAINING AND TECHNICAL COMPETENCIES 5

APPENDIX A - CONTINUING EDUCATION, TRAINING AND PROFICIENCY
PROGRAM A-1

ACKNOWLEDGMENT

The Assistant Secretary for Defense Programs is the Sponsor for the Facility Maintenance Management Qualification Standard. The Sponsor is responsible for coordinating the development and/or review of the Functional Area Qualification Standard by subject matter experts (SMEs) to ensure that the technical content of the standard is accurate and adequate for Department-wide application for those involved in facility maintenance management. The Sponsor, in coordination with the Federal Technical Capability Panel, is also responsible for ensuring that the Functional Area Qualification Standard is maintained current.

The following SMEs participated in the development and/or review of this qualification standard:

Joseph King DOE DP-45 (Team Lead)

Shawn Herrera DOE -NV

Steve Fattor DOE-AL

David Queen DOE-ORO

U.S. DEPARTMENT OF ENERGY FUNCTIONAL AREA QUALIFICATION STANDARD

FUNCTIONAL AREA

Facility Maintenance Management

PURPOSE

The Department's Federal Technical Capability Program Policy, issued by the Secretary in December 1998, commits the Department to continuously strive for technical excellence. The Technical Qualification Program, along with the supporting technical Functional Area Qualification Standards, complements the personnel processes that support the Department's drive for technical excellence. In support of this goal, the competency requirements defined in the technical Functional Area Qualification Standards should be aligned with and integrated into the recruitment and staffing processes for technical positions. The technical Functional Area Qualification Standards should form, in part, the primary basis for developing vacancy announcements, qualification requirements, crediting plans, interviewing questions, and other criteria associated with the recruitment, selection, and internal placement of technical personnel. Office of Personnel Management minimum qualifications standards will be greatly enhanced by application of appropriate materials from the technical Functional Area Qualification Standards.

The technical Functional Area Qualification Standards are not intended to replace the U.S. Office of Personnel Management's (OPM) Qualifications Standards nor other Departmental personnel standards, rules, plans, or processes. The primary purpose of the Technical Qualification Program is to ensure that employees have the requisite technical competency to support the mission of the Department. The Technical Qualification Program forms the basis for the development and assignment of DOE personnel responsible for ensuring the safe operation of defense nuclear facilities.

APPLICABILITY

The Facility Maintenance Management Functional Area Qualification Standard establishes common functional area competency requirements for Department of Energy facility maintenance management personnel who provide assistance, direction, guidance, oversight, or evaluation of contractor technical activities impacting the safe operation of defense nuclear facilities. The technical Functional Area Qualification Standard has been developed as a tool to assist DOE Program and Field offices in the development and implementation of the Technical Qualification Program in their organization. Program and Field offices may choose to use this technical Functional Area Qualification Standard as-is, or they may use parts of it to facilitate the

development of their own unique Technical Qualification Standards. In either case, satisfactory and documented attainment of the competency requirements contained in this technical Functional Area Qualification Standard, or similar Standards, ensures that facility maintenance management personnel possess the requisite competence to fulfill their functional area duties and responsibilities. Office/Facility-Specific Qualification Standards supplement this technical Functional Area Qualification Standard and establish unique operational competency requirements at the Headquarters or Field element, site, or facility level.

IMPLEMENTATION

This technical Functional Area Qualification Standard identifies the technical competency requirements for facility maintenance management personnel. Although there are other competency requirements associated with the positions held by facility maintenance management personnel, this Functional Area Qualification Standard is limited to identifying the specific technical competencies. The competency statements define the expected knowledge and/or skill that an individual must meet. Each of the competency statements is further explained by a listing of supporting knowledge and/or skill statements. **The supporting knowledge and/or skill statements are not requirements and do not necessarily have to be fulfilled to meet the intent of the competency.**

The competencies identify a familiarity level, a working level, or an expert level of knowledge; or they require the individual to demonstrate the ability to perform a task or activity. These levels are defined as follows:

Familiarity level is defined as basic knowledge of or exposure to the subject or process adequate to discuss the subject or process with individuals of greater knowledge.

Working level is defined as the knowledge required to monitor and assess operations/activities, to apply standards of acceptable performance, and to reference appropriate materials and/or expert advice as required to ensure the safety of Departmental activities.

Expert level is defined as a comprehensive, intensive knowledge of the subject or process sufficient to provide advice in the absence of procedural guidance.

Demonstrate the ability is defined as the actual performance of a task or activity in accordance with policy, procedures, guidelines, and/or accepted industry or Department practices.

Headquarters and Field elements shall establish a program and process to ensure that facility maintenance management personnel possess the competencies required of their position. That includes the competencies identified in this technical Functional Area Qualification Standard or a

similar Standard developed by the organization. Documentation of the completion of the requirements of the Standard shall be included in the employee's training and qualification record.

Equivalencies may be granted for individual competencies based upon an objective evaluation of the employee's prior education, experience, and/or training. Equivalencies shall be granted in accordance with the policies and procedures of the program or field office. The supporting knowledge and/or skill statements, while not requirements, should be considered before granting equivalency for a competency.

Training shall be provided to employees in the Technical Qualification Program that do not meet the competencies contained in the technical Functional Area Qualification Standard. Departmental training will be based upon appropriate supporting knowledge and/or skill statements similar to the ones listed for each of the competency statements. Headquarters and Field elements should use the supporting knowledge and/or skill statements as a basis for evaluating the content of any training courses used to provide individuals with the requisite knowledge and/or skill required to meet the technical Functional Area Qualification Standard competency statements.

EVALUATION REQUIREMENTS

Attainment of the competencies listed in this technical Functional Area Qualification Standard should be documented by a qualifying official or the immediate supervisor of facility maintenance management personnel using any of the following methods:

- Documented evaluation of equivalencies
- Written examination
- Documented oral evaluation
- Documented observation of performance

CONTINUING EDUCATION, TRAINING AND PROFICIENCY

Facility maintenance management personnel shall participate in continuing education and training as necessary to improve their performance and proficiency and ensure that they stay up-to-date on changing technology and new requirements. This may include courses and/or training provided by:

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

A description of suggested learning proficiency activities, and the requirements for the continuing education and training program for facility maintenance management personnel are included in Appendix A of this document. *[note: Appendix A may be developed at a later date, and not included as part of the initial issuance of the standard.]*

DUTIES AND RESPONSIBILITIES

The following are the typical duties and responsibilities expected of DOE defense nuclear facility technical personnel assigned to the Facility Maintenance Management Functional Area:

- A. Evaluate and determine the adequacy of facility maintenance programs, policies, and procedures to determine compliance with applicable codes, standards, guides, regulations, DOE Orders, and accepted practices.
- B. Review and analyze contractor performance, equipment failures, and occurrence data related to facility maintenance.
- C. Review and/or provide input to contractor annual programs and plans (e.g., award fee, budget, and operating plan).

Position-specific duties and responsibilities for facility maintenance management personnel are contained in their Office/Facility-Specific Qualification Standard or Position Description.

BACKGROUND AND EXPERIENCE

The U. S. Office of Personnel Management's Qualification Standards Handbook establishes minimum education, training, experience, or other relevant requirements applicable to a particular occupational series/grade level, as well as alternatives to meeting specified requirements.

The preferred education and experience for facility maintenance management personnel is:

1. Education:

Bachelor of Science degree in engineering or a related physical science degree; however, it is not a requirement. Facility maintenance management personnel should fulfill either the educational requirements or the experience requirements.

2. Experience:

Industry or government experience that has provided specialized experience in managing maintenance programs at complex industrial or nuclear facilities (e.g., planning,

executing, testing, and assessing maintenance activities). Specialized experience may be demonstrated through possession of the competencies outlined in this Standard.

REQUIRED TRAINING AND TECHNICAL COMPETENCIES

All facility maintenance management personnel must complete and pass the following training class:

- Radiation Safety Training

The competencies contained in this Standard are distinct from those competencies contained in the General Technical Base Qualification Standard. All facility maintenance management personnel must complete the competency requirements of the General Technical Base Qualification Standard prior to or in parallel with the completion of the competency requirements contained in this Standard. Each of the competency statements defines the level of expected knowledge and/or skill that an individual must possess to meet the intent of this Technical Qualification Standard. **The supporting knowledge and/or skill statements further describe the intent of the competency statements but are not requirements.**

Note: When regulations or Department of Energy directives or other industry standards are referenced in the Qualification Standard, the most recent revision should be used.

- 1. Facility maintenance management personnel shall demonstrate a working level knowledge of the Department of Energy's requirements for facility maintenance management as outlined in DOE Order 4330.4B, Maintenance Management Program.**

Supporting Knowledge and/or Skills

- a. Explain the Department of Energy's role in the oversight of contractor maintenance operations.
- b. Explain the intent of DOE Order 4330.4B, Maintenance Management Program.
- c. Discuss the Department's policy and objectives for maintenance management.
- d. Describe responsibilities and authorities for maintenance management programs.

- e. Describe the purpose, scope and requirements of Maintenance Implementation Plans (MIPs).
- 2. Facility maintenance management personnel shall demonstrate a familiarity level knowledge of the following maintenance management-related Department of Energy Technical Standards and Good Practice Guide:**
- **DOE-STD-1050-93, Guideline to Good Practices for Planning, Scheduling, and Coordination of Maintenance at DOE Nuclear Facilities**
 - **DOE-STD-1051-93, Guideline to Good Practices for Maintenance Organization and Administration at DOE Nuclear Facilities**
 - **DOE-STD-1052-93, Guideline to Good Practices for Types of Maintenance at DOE Nuclear Facilities**
 - **DOE-STD-1053-93, Guideline to Good Practices for Control of Maintenance Activities at DOE Nuclear Facilities**
 - **DOE-STD-1054-93, Guideline to Good Practices for Control and Calibration Measuring and Test Equipment (M&TE) at Nuclear Facilities**
 - **DOE-STD-1055-93, Guideline to Good Practices for Maintenance Management Involvement at DOE Nuclear Facilities**
 - **DOE-STD-1064-94, Guideline to Good Practices for Seasonal Facility Preservation at DOE Nuclear Facilities**
 - **DOE-STD-1065-94, Guideline to Good Practices for Postmaintenance Testing at DOE Nuclear Facilities**
 - **DOE-STD-1067-94, Guideline to Good Practices for Maintenance Facilities, Equipment, and Tools at DOE Nuclear Facilities**
 - **DOE-STD-1069-94, Guideline to Good Practices for Maintenance Tools and Equipment Control at DOE Nuclear Facilities**
 - **DOE-STD-1071-94, Guideline to Good Practices for Material Receipt, Inspection, Handling, Storage, Retrieval, and Issuance at DOE Nuclear Facilities**
 - **DOE-STD-1072-94, Guideline to Good Practices for Facility Condition Inspections at DOE Nuclear Facilities**
 - **DOE-STD-1073-93, Guide for Operational Configuration Management Program**
 - **GPG-FM-031, Life Cycle Asset Management Good Practice Guide, Maintenance**

Supporting Knowledge and/or Skills

- a. Describe the purpose, scope, and application of the requirements detailed in the Technical Standards listed above.

3. Facility maintenance management personnel shall demonstrate a working level knowledge of the Department of Energy's requirements for facility maintenance management as outlined in DOE Order 430.1A, Life-Cycle Asset Management.

Supporting Knowledge and/or Skills

- a. Explain the Department of Energy's role in life-cycle asset management and its interrelationship with the oversight of contractor maintenance operations.
- b. Explain the intent of DOE Order 430.1A, Life-Cycle Asset Management.
- c. Discuss the Department's policy and objectives for life-cycle asset management.
- d. Describe responsibilities and authorities for life-cycle asset management.

4. Facility maintenance management personnel shall demonstrate a working level knowledge of the requirements for training and qualification program as identified in the following Department of Energy (DOE) Orders:

- **DOE Order 5480.20A, Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities**
- **DOE Order 4330.4B, Maintenance Management Program**

Supporting Knowledge and/or Skills

- a. Describe the purpose and scope of DOE Order 5480.20, Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities as it relates to the conduct of maintenance related training. Integrate this directive's requirements with those of DOE Order 4330.4B.

5. Facility maintenance management personnel shall demonstrate a familiarity level knowledge of the facility maintenance management-related sections and/or requirements of the following related Department of Energy (DOE) Orders:

- **DOE Order 414.1, Quality Assurance**
- **DOE Order 420.1, Facility Safety**
- **DOE Order 440.1A, Worker Protection Management for DOE Federal and Contractor Employees**
- **DOE Order 5480.4, Environmental Protection, Safety, and Health Protection**

Standards

- **DOE Order 5480.21, Unreviewed Safety Questions**
- **DOE Order 5480.22, Technical Safety Requirements**
- **DOE Order 5480.23, Nuclear Safety Analysis Reports**

Supporting Knowledge and/or Skills

- a. Describe the purpose, scope, and application of the requirements detailed in the Orders above listed.
- b. Discuss the impact and/or relationship of the Orders listed above to the facility maintenance management functional area.

- 6. Facility maintenance management personnel shall demonstrate a familiarity level knowledge of methods to maintain communication with Headquarters, Field elements, and the public.**

Supporting Knowledge and/or Skills

- a. Describe the Department's organization and discuss the procedures for communicating between elements.
- b. Describe the Department's procedures and policy for communicating with regulatory agencies.

- 7. Facility maintenance management personnel shall demonstrate a working level knowledge of contractor and Department organization and structure as they relate to maintenance management responsibilities and authority.**

Supporting Knowledge and/or Skills

- a. Define the maintenance organizational structure.
- b. Describe the responsibilities of individuals in the organization and their authority.
- c. Describe the relationship and interface of the maintenance organization with other organizational structures.

- 8. Facility maintenance management personnel shall demonstrate a working level knowledge of assessment techniques (such as the planning and use of observations, interviews, and document reviews) to assess facility performance, report results of assessments, and follow-up on actions taken as the result of**

assessments.

Supporting Knowledge and/or Skills

- a. Describe the role of facility maintenance management personnel with respect to oversight of Government-Owned Contractor-Operated (GOCO) facilities.
 - b. Describe the assessment requirements and limitations associated with the interface with contractor employees.
 - c. Discuss the essential elements of a performance-based assessment including:
 - @ Investigation
 - @ Fact finding
 - @ Exit interview
 - @ Reporting
 - @ Follow-up
 - @ Closure
 - d. Describe the following assessment methods and the advantages or limitations of each method:
 - @ Document review
 - @ Observation
 - @ Interview
 - e. Describe the action(s) to be taken if the contractor challenges the assessment findings and explain how such challenges can be avoided.
- 9. Facility maintenance management personnel shall demonstrate a working level knowledge of problem analysis principles and techniques necessary to identify maintenance problems, determine potential causes of problems, and identify corrective action(s).**

Supporting Knowledge and/or Skills

- a. Discuss the elements of an analysis program.
- b. Discuss the guidelines for information collecting.
- c. Discuss event causal factors for human performance problems.

- d. Discuss event causal factors for equipment performance problems.
 - e. Describe and explain the application of problem analysis techniques including the following:
 - @ Root cause analysis
 - @ Causal factor analysis
 - @ Change analysis
 - @ Barrier analysis
 - @ Management Oversight Risk Tree analysis
 - f. Describe and explain the application of the following root cause analysis processes in the performance of occurrence investigations:
 - @ Events and causal factors charting
 - @ Root cause coding
 - @ Recommendation generation
 - g. Compare and contrast immediate, short term, and long term actions taken as the result of a problem identification or an occurrence.
 - h. Describe various data gathering techniques and the use of trending/history when analyzing problems.
- 10. Facility maintenance management personnel shall demonstrate a familiarity level knowledge of the Department of Energy/facility contract provisions necessary to provide oversight of a contractor's performance.**

Supporting Knowledge and/or Skills

- a. Describe the role of facility maintenance management personnel in contractor oversight.
- b. Compare and contrast the following:
 - @ The Department of Energy's expectations of a contractor
 - @ Contractor's expectations of the Department of Energy
- c. Discuss the key elements and features of an effective Department of Energy and contractor relationship.

**APPENDIX A
CONTINUING EDUCATION, TRAINING AND PROFICIENCY PROGRAM**

The following list represents suggested continuing education, training and other opportunities that are available for facility maintenance management personnel after completion of the competency requirements in this technical Functional Area Qualification Standard. It is extremely important that personnel involved with facility maintenance management maintain their proficiency through continuing education, training, reading, or other activities such as workshops, seminars, and conferences. The list of suggested activities was developed by the Subject Matter Experts involved in the development of the Functional Area Qualification Standard and is not all inclusive.

Based on the knowledge and experience of the Subject Matter Experts, it is suggested that [*to be determined*] learning activities per [*to be determined*] are necessary to maintain proficiency in the facility maintenance management functional area after completion of the competencies in the Standard and other requirements of the Technical Qualification Program.

LIST OF CONTINUING EDUCATION, TRAINING AND OTHER ACTIVITIES

XXXXXXXXXXXXXXXXXXXXX