

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

**FIRE
PROTECTION QUALIFICATION
STANDARD COMPETENCIES**

**Defense Nuclear Facilities Technical
Personnel**

May 1995

1. GENERAL TECHNICAL

See "Required Background".

2. REGULATORY

NOTE: 1: When Department of Energy (DOE) directives are referenced in the qualification standard, the most recent revision should be used.

2.1 Fire protection personnel shall demonstrate an expert level knowledge of Department of Energy (DOE) Order 5480.7A, Fire Protection.

Supporting Knowledge and/or Skills

- a. Describe the purpose and content of the Order.
- b. Explain the applicability of the Order.
- c. State the objectives of the Order.
- d. Identify the additional fire protection related codes, standards, and regulations which contain minimum mandatory fire protection implementation criteria for Department Fire Protection Programs.
- e. Define the following terms and identify when the use of each process is appropriate in accordance with the Order:
 - Equivalency
 - Exemption
- f. Identify the requirements for an individual to be considered a "Qualified Fire Protection Engineer".
- g. Explain the responsibilities of each of the following with respect to the implementation of the requirements of the Order:
 - Cognizant Secretarial Officers
 - Assistant Secretary for Environment, Safety, and Health
 - Director of Nuclear Safety
 - Assistant Secretary for Nuclear Energy
 - Director of Administration and Management
 - Heads of Field Organizations
 - Heads of Headquarters Elements
 - Contractor Organizations
- h. Identify the basic requirements which must be met by a Department of

Energy Fire Protection Program as described in Section 9 of the Order.

i. Describe the role of Department Fire protection personnel with respect to implementation of this Order.

2.2 Fire protection personnel shall demonstrate a familiarity of the fire protection related aspects of the following Department of Energy (DOE) Orders and Standards:

- DOE Order 5480.4, Environmental Protection, Safety, and Health Protection Standards
- DOE 5482.1B, Environment, Safety, and Health Appraisal Program
- DOE Order 5484.1, Environmental Protection, Safety, and Health Protection Information Reporting Requirements

Supporting Knowledge and/or Skills

- a. Describe the content, requirements, relationships, and importance of these Orders with respect to fire protection issues.
- b. Discuss the "minimum mandatory" requirements/criteria, if any, contained in these documents in accordance with Section 5 of DOE Order 5480.7A, Fire Protection.
- c. Discuss the Contractor's fire protection responsibilities associated with implementation of these Orders.
- d. Describe the role of Department fire protection personnel with respect to implementation of the fire protection related requirements of these Orders.

2.3 Fire protection personnel shall demonstrate familiarity with the requirements for design control processes identified in the Department of Energy (DOE) Order 6430.1A, General Design Criteria, related to fire protection systems and components.

Supporting Knowledge and/or Skills

- a. Describe the "key elements" of DOE Order 6430.1A, General Design Criteria.
- b. Discuss the application of these "key elements" to the design of fire protection systems.
- c. Describe the desired content of design records.
- d. Identify who may conduct fire protection system and/or component design verifications.
- e. Describe the acceptable methods of conducting design verifications.
- f. Describe the conditions to be considered when testing to verify or validate design features.

3. ADMINISTRATIVE

3.1 Fire protection personnel shall demonstrate a familiarity level knowledge of the requirements and methods to maintain communications with Headquarters, field elements, and other regulatory agencies.

Supporting Knowledge and/or Skills

- a. Describe the Department's organization and discuss the Department's procedures for communicating between Headquarters and Field Elements.
- b. Describe the Department's procedures and policy for communicating with state and local organizations, the Occupational Safety and Health Administration (OSHA), and other regulatory agencies.

3.2 Fire protection personnel shall demonstrate a working level knowledge of the record-keeping and reporting requirements specified by industry standards and Department Orders.

Supporting Knowledge and/or Skills

- a. Discuss the Department's record-keeping and reporting requirements for fire protection programs.
- b. Given a copy of the Annual Summary of Department of Energy Fire Protection Programs, discuss the contents and its application within the Department.
- c. Given a copy of the Fire Protection Resource Manual, discuss the contents and its application within the Department.

4. MANAGEMENT, ASSESSMENT, AND OVERSIGHT

NOTE: 1: When Department of Energy (DOE) directives are referenced in the qualification standard, the most recent revision should be used.

4.1 Fire protection 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 fire protection 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 to be taken if the contractor challenges the assessment findings and explain how such challenges can be avoided.

4.2 Fire protection personnel shall demonstrate the ability to conduct assessments, develop corrective actions and recommendations, communicate assessment results, and develop supporting reports.

Supporting Knowledge and/or Skills

- a. Conduct a compliance-based assessment and a performance-based assessment. Identify the differences in outcomes and the reasons for these differences.
- b. Write an assessment appraisal report.
- c. Based on an evaluation of contractor activities, develop corrective actions and recommendations and communicate these to contractor management.
- d. Participate in a formal meeting between Department of Energy management and senior contractor management to discuss results of a fire protection assessment.

4.3 Fire protection personnel shall demonstrate the ability to trend fire protection related information/data.

Supporting Knowledge and/or Skills

- a. Using the appropriate process, trend and analyze operations information and discuss its relationship to fire protection activities.
- b. Using an actual list of performance indicators, determine what type of assessment should be performed and in what areas.
- c. Identify and discuss typical performance indicators that are used to review fire protection activities.

4.4 Fire protection personnel shall demonstrate an expert level knowledge of the requirements and process for granting exemptions and equivalencies for fire protection activities.

Supporting Knowledge and/or Skills

- a. Given an exemption or equivalency request, review, evaluate, and make recommendations for granting such requests.
- b. Describe the factors that must be considered before granting exemptions and equivalencies.
- c. Describe the approval process for exemptions and equivalencies and the documentation requirements.

4.5 Fire protection personnel shall demonstrate an ability to apply fire safety evaluation criteria and methods to minimize the occurrence and extent of fires.

Supporting Knowledge and/or Skills

- a. Perform a facility assessment for fire safety that includes the following:
 - House-keeping
 - Configuration control
 - Fire loading
 - Hot work (including welding, torch use and open flame)
 - Smoking policy (cigarettes, etc.)
 - Impairment control
 - Hazard recognition
 - Work controls

- b. Discuss the importance of management commitment and the criteria used to evaluate this commitment to the following:
 - Deficiency resolution
 - Self-assessment
 - Issues management
 - Conduct of Operations
 - Trending and Analysis
 - Preventive maintenance
 - Resource allocation (dollars, personnel, equipment)

- c. Review a quality assurance program related to the fire protection organization and activities. Analyze the program for the following:
 - Independent verification
 - Control of transient combustibles
 - Personnel training
 - Documentation
 - Quality Assurance Implementation Plan

4.6 Fire protection personnel shall demonstrate a working level knowledge of emergency response operations including personnel training and qualification, equipment, and facilities.

Supporting Knowledge and/or Skills

- a. Discuss the relationships between, and importance of, the following as
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related to emergency response operations:

- Alarms and/or Monitoring
- Central Alarm Station (design)
- Dispatching
- Communication equipment and methods
- Interface with other organizations

b. Discuss fire protection concerns associated with providing emergency response operation activities for the following:

- Confined space entry
- Emergency medical response
- Hazardous material
- Fire fighting
- Smoke removal
- Occupant evacuation
- Water removal
- Run-Off Containment
- Transportation accidents
- Rescue

c. Discuss the fire protection and emergency response concerns associated with the staffing and readiness of personnel including:

- Evaluation of staffing levels
- Mutual Aid Response Agreements
- Health and physical fitness
- Central alarm station staffing

d. Explain the importance of emergency exercise evaluation and discuss the criteria used in conducting an evaluation of the following with respect to emergency response readiness:

- Emergency drills
- Equipment
- Training
- Qualifications
- Safety documentation
- Occupational safety and health

4.7 Fire protection personnel shall demonstrate the ability to assess emergency response operations including personnel training and qualification, equipment, and facilities.

Supporting Knowledge and/or Skills

- a. Evaluate an emergency plan and explain the importance of pre-planning activities and emergency plan implementation exercises and drills.
- b. Evaluate the emergency response operations equipment in accordance with procedure/code requirements.
- c. Assess response times for emergency personnel and equipment with respect to emergency response operations.
- d. Observe and evaluate emergency response equipment and facility maintenance.
- e. Observe and evaluate emergency response personnel training and drills.
- f. Observe and evaluate the emergency response operations associated with the following:
 - Fire emergency
 - Medical emergency
 - Hazardous material emergency

 - Standby for hazardous operation
 - Hazardous duty/activity standby.
- g. Evaluate the number and distribution of fire stations in accordance with the applicable standard/code.

4.8 Fire protection personnel shall demonstrate a familiarity level knowledge of contract management and administration sufficient to appraise contractor organizations in the area of fire protection.

Supporting Knowledge and/or Skills

- a. Discuss the key elements of the contractual relationship between the Department of Energy and the contractor, and the process for preparing cost estimates and budgets.
- b. Describe the role of fire protection personnel with respect to the evaluation of contractor fire protection programs for the cost-plus award fee process.

c. Describe the responsibilities of fire protection personnel associated with contractor compliance with the Price-Anderson Act.

d. Using actual or hypothetical data from a fire protection program, discuss the program's budget, schedule, and impact on the fire protection activities.

4.9 Fire protection personnel shall demonstrate the ability to evaluate fire protection training and qualification programs.

Supporting Knowledge and/or Skills

a. Observe and evaluate two on-the-job training exercises for adequacy and adherence to appropriate local guidelines.

b. Review a set of contractor fire protection personnel training records for accuracy and completeness.

4.10 Fire protection personnel shall demonstrate the ability to independently assess contractor and/or Federal employee compliance with the requirements contained in Department of Energy (DOE) Order 5480.7A, Fire Protection.

Supporting Knowledge and/or Skills

a. Assess contractor and/or Department work activities associated with fire protection in accordance with the responsibilities and requirements contained in DOE Order 5480.7A.

b. Given data from an assessment, analyze the results to determine compliance or noncompliance with the requirements.

c. Given the results from an analysis of compliance or noncompliance, document the results and communicate the results to contractor and/or Department line management.

4.11 Fire protection personnel shall demonstrate the ability to independently assess contractor and/or Federal employee compliance with the requirements contained in the following Department of Energy (DOE) Orders with respect to fire protection issues:

· DOE Order 5480.4, Environmental Protection, Safety, and Health Protection Standards

· DOE 5482.1B, Environment, Safety, and Health Appraisal

Program

Supporting Knowledge and/or Skills

a. Assess contractor and/or Department work activities associated with fire protection in accordance with the responsibilities and requirements of the above Orders.

b. Given data from an assessment, analyze the results to determine compliance or noncompliance with the requirements.

c. Given the results from an analysis of compliance or noncompliance, document the results and communicate the results to contractor and/or Department line management.

EVALUATION REQUIREMENTS

The following requirements shall be met to complete the Fire Protection Engineer 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 in accordance with the requirements contained in that standard.
2. Classification by the cognizant personnel management office as a Fire Protection Engineer. The Office of Personnel Management sanctioned equivalencies or alternatives may be applied.
2. Documented completion of the competencies listed in this functional area qualification standard. Documentation of the successful completion of these competencies may be satisfied by a qualifying official using any of the following methods:
 - Documented evaluation of equivalencies
 - Written examination
 - Oral evaluation
 - Observation of performance

CONTINUING TRAINING AND PROFICIENCY REQUIREMENTS

Fire Protection Engineers shall participate in an office/facility/position-specific continuing training and qualification program that includes the following elements:

1. Continuing technical education and/or training covering topics directly related to the duties and responsibilities of fire protection engineering as determined by appropriate management. This may include courses and/or training provided by:
 - Department of Energy
 - Other Government agencies
 - Outside vendors
 - Educational institutions
 - Professional conferences and meetings such as:
 - DOE Annual Fire Protection Conferences
 - NFPA Annual and/or Fall Meetings
 - Factory Mutual

- ASTM E-5 Committee Meetings
 - NFPA Standards Committee Meetings
2. Training covering topics that address identified deficiencies in the knowledge and/or skills of the fire protection individual.
 3. Training in areas added to the Fire Protection Functional Area Qualification Standard since initial qualification.
 4. At a minimum, the continuing training and proficiency activities of fire protection personnel should include the following each year:
 - Site/facility/position-specific topics such as changes to the facility, significant facility events
 - Industry events (including both Department of Energy and applicable commercial events)
 - Lessons learned
 5. Fire protection personnel must be actively engaged in responsible fire protection related activities each year to maintain their qualification.