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DOE–STD–1160–2003
March 2003

DOE STANDARD

OCCUPATIONAL SAFETY FUNCTIONAL AREA QUALIFICATION STANDARD

DOE Defense Nuclear Facilities Technical Personnel

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

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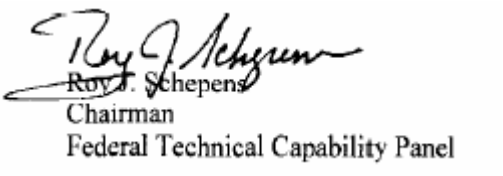
APPROVAL

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



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Federal Technical Capability Panel

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ACKNOWLEDGMENT

The U.S. Department of Energy, Richland Operations Office (RL) is the sponsor for this occupational safety standard. The sponsor is responsible for coordinating the development and/or review of the Functional Area Qualification Standard by subject matter experts to ensure the technical content of the standard is accurate and adequate for Department-wide application for those involved in occupational safety. The sponsor, in coordination with the Federal Technical Capability Panel, is also responsible for ensuring the Functional Area Qualification Standard is maintained current.

The following subject matter experts participated in the development and/or review of this qualification standard:

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U.S. DEPARTMENT OF ENERGY
FUNCTIONAL AREA QUALIFICATION STANDARD

FUNCTIONAL AREA

Occupational Safety

PURPOSE

The U.S. Department of Energy (DOE) *Federal Technical Capability for Defense Nuclear Facilities,* Policy 426.1, issued by the Secretary of Energy in December 1998, commits the DOE 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 DOE's drive for technical excellence. In support of this goal, the competency requirements defined in the Technical Qualification Standards should be aligned with and integrated into the recruitment and staffing processes for technical positions. The Technical 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. The U.S. Office of Personnel Management (OPM) minimum qualification standards will be greatly enhanced by the application of appropriate materials from the Functional Area Qualification Standards.

The Occupational Safety Functional Area Qualification Standard is not intended to replace the OPM Qualification Standards or other DOE 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 DOE mission. 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 Occupational Safety Functional Area Qualification Standard establishes common functional area competency requirements for DOE Occupational Safety personnel who provide assistance, direction, guidance, oversight, or evaluation of contractor technical activities impacting the safe operation of defense nuclear facilities. The Occupational Safety 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 occupational safety personnel possess the requisite competence to fulfill their functional area duties and responsibilities. Office/facility-specific qualification standards supplement this Occupational Safety Functional Area Qualification Standard and establish unique operational competency requirements at the DOE-Headquarters or field element, site, or facility level.

REFERENCES

1. Government Documents

   DOE Directives (Policies and Orders)

   a. DOE Policy 426.1, *Federal Technical Capability for Defense Nuclear Facilities.*

   b. DOE Order 440.1A, *Worker Protection for DOE Federal and Contractor Employees*, and supporting implementation guides (DOE Guide 440.1-X series).

2. Other Government Documents

   a. Executive Order 12196, *Occupational Safety and Health Programs for Federal Employees*.

   b. 29 *Code of Federal Regulations,* Part 1904, "Recording and Reporting Occupational Injuries and Illnesses."

   c. 29 *Code of Federal Regulations,* 1910, "Occupational Safety and Health Regulations."

   d. 29 *Code of Federal Regulations,* 1926, "Safety and Health Regulations for Construction."

   e. 29 *Code of Federal Regulations,* 1960, "Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters."

   f. *Price Anderson Amendments Act.*

   g. Public Law 91-596, *Occupational Safety and Health Act of 1970*.

   h. U. S. Office of Personnel Management, *Qualification Standards for General Schedule Positions Operating Manual.*

IMPLEMENTATION REQUIREMENTS

This technical Functional Area Qualification Standard identifies the technical competency requirements for Occupational Safety personnel. Although there are other competency requirements associated with the positions held by Occupational Safety personnel, this Functional Area Qualification Standard is limited to identifying 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 the 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 the knowledge required to monitor and assess operations/activities, to apply acceptable performance standards, and to reference appropriate materials and/or expert advice as required to ensure the safety of DOE activities.

- **Expert level** is a comprehensive, intensive knowledge of the subject or process sufficient to **provide** advice in the absence of procedural guidance, including working level (on the job) experience.

- **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.

DOE-Headquarters and Field Elements shall establish a program and process to ensure that occupational safety 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 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, professional certification, 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. DOE-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

The following requirements shall be met to complete the DOE-wide Occupational Safety Functional Area Qualification Standard. The following evaluation process serves as a measurement tool for assessing whether the participants have acquired the technical competencies outlined in this standard.

1. Documented completion of the DOE-wide General Technical Base Qualification Standard in accordance with the requirements contained in that standard.

2. Documented completion of the competency requirements listed in this Functional Area Qualification Standard. Documentation of the successful completion of these competency requirements may be satisfied by a qualifying official or supervisor using any of the following methods:

    - Documented equivalencies evaluation
    - Written examination
    - Documented oral evaluation
    - Documented performance observation
    - Experience level

- Equivalency derived from professional certification and/or state registration.

CONTINUING EDUCATION, TRAINING AND PROFICIENCY REQUIREMENTS

Occupational safety 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. Specific care shall be taken to ensure that all training be approved by the appropriate professional organization to control the quality and relevance of the training. This may include professional qualified courses (e.g., American Society of Safety Engineers, American Industrial Hygiene Association or the Voluntary Protection Program Participants Association), professional development conferences, workshops, and/or training provided by the following:

- DOE
- Other government agencies
- Outside vendors
- Educational institutions
- Professional societies/organizations (e.g., American Society of Safety Engineers, American Industrial Hygiene Association or the Voluntary Protection Program Participants Association).

A description of suggested learning proficiency activities and requirements for the continuing education and training program for occupational safety personnel is included in the Continuing Training and Proficiency Requirements section (Appendix).

DUTIES AND RESPONSIBILITIES

The following are the typical duties, authorities, and responsibilities expected of DOE defense nuclear facility technical personnel assigned to the occupational safety functional area:

1. Serve as a technical authority in occupational and industrial safety for both DOE and contractors concerning safety issues.

2. Review occupational safety analyses, assessments, and other occupational safety documentation for compliance with applicable requirements.

3. Evaluate the adequacy of, and make any necessary recommendations regarding, facilities and equipment using established standards, and determine compliance to prevent failure or injury.

4. Review proposed and existing program documents for scope, content, and adequacy; and recommend improvements in occupational and industrial safety practices and procedures.

5. Develop solutions to problems involving substantial modification of existing standards and practices, methods, and techniques, utilizing in-depth knowledge of physical phenomena, engineering, and scientific concepts related to occupational safety.

6. Conduct occupational safety evaluations, inspections, and assessments of safety programs, operations, and facilities to ensure compliance with local, state, and Federal rules, regulations, and standards.

7. Conduct, or assist in conducting investigations of facility deficiencies, equipment failures, accidents, injuries, or fatalities to determine causal factors and recommend corrective actions.

8. Represent DOE in meetings, conferences, and committees involving technical issues, policy, and other matters pertinent to occupational safety, and coordinate occupational safety programs with other Federal agencies.

9. Identify the necessary hazard control measures and required abatement activities and establish that the contractor is utilizing the appropriate hazard analysis technique for each situation, including proper job postings.

10. Evaluate the contractor's hazard analyses program and procedures and establish that their control measures and abatement activities are based on established hierarchy of controls.

11. Serve as chairperson, member, or technical advisor of accident/incident boards at the assigned facility or other DOE installations.

12. Determine the need for, organize, and chair working groups involving DOE, contractors, and other agency personnel in order to facilitate information exchange and to solve difficult and complex issues or problems that could have occupational safety impact.

13. Understand and be knowledgeable regarding the procedure for obtaining a variance from occupational safety standards and requirements.

14. Respond to congressional and public inquiries through appropriate channels. Prepare expert testimony, briefings, and speeches to support DOE's occupational safety programs.

15. Represent the site and/or the Department at occupational safety meetings, professional conferences, and technical standards committees.

16. Serve as a subject matter expert (SME) in occupational safety issues or requirements. Provide advice to both management and workers to resolve safety issues. These issues may involve, but are not limited to, conflicts concerning schedule, cost, program inconsistencies, improvements, equipment, or training adequacy as they relate to worker safety and health or other safety requirements.

17. Evaluate or establish priorities and abatement for action involving occupational safety and provide advice on consequences of deferring action.

18. Participate in special assignments and perform assessments related to occupational safety.

Any technical professional tasked with the above responsibilities will be provided with the authority necessary to carry out these responsibilities.

Position-specific duties and responsibilities for occupational safety personnel are contained in their office/facility-specific qualification standard or position description.

BACKGROUND AND EXPERIENCE

OPM's *Qualification Standards for General Schedule Positions Operating Manual* 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. Federal Safety Engineers are required to meet OPM standards for Occupational Series 803 or equivalent for the grade level of their position.

If an individual position is classified under another OPM Series such as "General Engineer" (801), the incumbent should be evaluated by a personnel classification specialist and/or qualified safety manager to verify that the requirements, including alternatives, for Series 803 are met for the grade of the position.

The preferred education and experience for occupational safety personnel is as follows:

Education

Undergraduate and Graduate

Major study should be in safety or occupational health fields (safety, occupational health, industrial hygiene), or degree in other related fields that included or was supplemented by at least 24 semester hours of study from among the following (or closely related) disciplines:

- Safety
- Occupational health
- Industrial hygiene
- Occupational medicine
- Toxicology
- Public health
- Mathematics
- Physics
- Chemistry
- Biological sciences
- Engineering
- Industrial psychology.

Alternative requirements specified in the *Qualification Standards for General Schedule Positions Operating Manual* for GS-018, Safety and Occupational Health Management are also acceptable.

OR

Engineering or Bachelor of Science degree in a related professional field (for example, architecture, physics, mathematics, or chemistry) is the minimum educational requirement. Candidates are preferred if they have taken courses in safety-related fields (for example, industrial safety, occupational safety, industrial hygiene, mine safety) from an accredited institution.

OR

Candidates demonstrating professional certification or registration from an accredited organization or state should meet the alternative requirements specified in the *Qualification Standards for General Schedule Positions Operating Manual* for GS-0803, Safety Engineering Series or GS-690, Industrial Hygiene.

Experience

Experience is a critical aspect of ensuring competency and proficiency in the various functional technical areas. Experience may include industrial, military, Federal, state-related occupations, professional registrations, or may be gained from other occupations that specialize in occupational safety programs. Specialized experience may be demonstrated through possession of the competency requirements outlined in this standard. Safety and Health technical professionals are encouraged to seek certification in their subject discipline, but it is not mandatory.

REQUIRED TECHNICAL COMPETENCIES

Each of the following technical standard 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.

The occupational safety competency statements generally refer to interface with workers in relation to their performed task and operation of equipment. The supporting knowledge and/or skills statements can be tailored to ensure the correct expertise mix is available within a site's occupational safety staff.

Note: Use the most recent revisions of regulations, DOE directives, or industry standards referenced in the qualification standard.

1. **Occupational safety personnel shall demonstrate a working-level knowledge of occupational safety-related requirements of DOE Order 440.1A, technical standards, Occupational Safety and Health Administration regulations, and 29 CFR 1960, "Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters."**

   Supporting Knowledge and/or Skills

   a. Describe purpose, responsibilities, and requirements of DOE orders with respect to occupational safety.

   b. Discuss compatibility between, and describe the respective applicability of, occupational safety requirements contained in DOE orders and applicable local, state, or Federal regulations.

   c. Discuss relationship between DOE orders and OSHA standards and have a working knowledge of the applicability of OSHA requirements to DOE and contractors, including subcontractors.

   d. Describe appropriate or required measures for obtaining interpretations of, or variances/exemptions from, occupational safety requirements in DOE orders.

   e. Discuss the OSHA General Duty Clause of Public Law 91-596, Section 5 (a)(1) and its applicability.

   f. Discuss and have a working knowledge of Executive Order 12196 and OSHA 29 CFR 1960.

   g. Describe organization of CFRs in terms of titles, chapters, parts, and sections.

h. Describe the purpose, scope, and application of requirements in the following regulations as they apply to DOE facilities:

- 29 CFR 1904, “Recording and Reporting Occupational Injuries and Illnesses”
- 29 CFR 1910, “Occupational Safety and Health Regulations”
- 29 CFR 1926, “Safety and Health Regulations for Construction”
- 29 CFR 1960, “Basic Program Elements for Federal Employee Occupational Safety and Health Programs and Related Matters.”

i. Discuss relationship between CFRs and the Federal Register in terms of determining the latest version of any rule.

j. Describe difference between Requests for Information, Advanced Notice of Proposed Rulemaking, Notice of Proposed Rulemaking, and a Final Rule as it relates to regulatory entries in the Federal Register.

k. Describe job safety analyses, hazard analyses, and other safety review techniques when implementing occupational safety requirements.

2. Occupational safety personnel shall demonstrate the ability to perform occupational safety trend analyses.

Supporting Knowledge and/or Skills

a. Discuss key processes used in operation trending, analysis, post-operation activity information, and their relationships to occupational safety activities.

b. Determine what type of assessment should be performed and in what areas using an actual list of performance indicators.

c. Analyze incident/occurrence report data for a specified period for safety trends or compliance problems and communicate results to workers and management.

d. Describe OSHA's injury and illness record keeping and the DOE Computerized Accident/Incident Reporting System and subsequent uses in safety trending.

3. Occupational safety personnel shall demonstrate expert-level knowledge of safety considerations associated with industrial operations.

Supporting Knowledge and/or Skills

a. Describe common industrial operations (e.g., maintenance, production, testing, inspection, setup [both facility and equipment]) and related activities (e.g., welding, material handling, machining, cleaning, and coating), including the safety interfaces necessary to protect workers and safely perform work.

b. Describe safety considerations associated with placement of operations and equipment (i.e., location of personnel in the proximity of moving equipment or parts, traffic patterns, and structural support for equipment).

c. Outline point of operation hazards associated with workplace equipment and describe appropriate machine guarding principles.

d. Describe common concerns and associated control measures that must be addressed in the workplace environment (e.g., noise, thermal burn hazards, heat stress, vibration, eye hazards, workplace illumination, and lasers).

e. Address the following confined space hazard considerations for industrial operations:
   - Describe the characteristics of a confined space hazard
   - Identify potential construction-related confined space locations
   - Identify and discuss the application of confined space entry procedures.

f. Describe industrial-related electrical considerations (e.g., temporary wiring, grounding, and exposed electrical wires, equipment, or parts).

g. Define the following hazards and appropriate controls use associated with hoisting and rigging equipment and operations:

   - Crane load tests and inspection requirements
   - Effects of boom angle and length on load limits
   - Major signs of stress, strain, or other deterioration that must be evaluated when inspecting rigging equipment
   - Overhead power lines
   - Appropriate lifting techniques and limitations including the relationship between the crane operator and the guide
   - Potential hazards associated with the use of suspect counterfeit parts.

h. Identify sources of potential fall hazards and recommend appropriate controls.

i. Identify general personal protective equipment (PPE) requirements and effects of PPE on safety and worker performance for industrial operations.

j. Describe and have a working knowledge of the Hazardous Waste Operations and Emergency Response Regulations (HAZWOPER) activities at a waste site.

k. Outline the elements of an effective decontamination and decommissioning program, including HAZWOPER activities.

l. Discuss elements of hazard communications within industrial operation involving special programs (e.g., nonsmoking work environment program, vehicle safety, violence in the workplace, asbestos, silica, lead, beryllium, blood-borne pathogens, and infectious diseases).

m. Describe non-ionizing radiation hazards and appropriate control measures.

4. Occupational safety personnel shall demonstrate an expert-level knowledge of electricity and electrical hazards and controls to enable them to develop, implement, and evaluate an electrical safety program.

Supporting Knowledge and/or Skills

a. Describe general terminology associated with electricity and electrical hazards.

b. Define specific terminology applicable to the following:

- Measurement of electricity
- Power systems
- Electrical distribution systems
- Protective devices
- Control measures.

c. Describe major safety concerns and appropriate control measures for working on or near live electrical equipment (e.g., proper use of lockout/tagout procedures).

d. Describe the use, function, and appropriate application of PPE designed to protect workers from identified electrical hazards.

e. Identify necessary training required for employees who face a risk of electric shock.

f. Identify specific safety-related work practices for a work place scenario, consistent with the nature and extent of associated electrical hazards.

g. Describe first aid procedures for electrical shock.

h. Identify and discuss application and function of major safety requirements and protective devices associated with electrical equipment and wiring in locations that are classified as hazardous.

i. Identify potential electrical hazards for a given process, operation, or piece of equipment; locate, interpret, and apply requisite requirements and/or standards; and recommend suitable or mandated control measures.

j. Discuss the need for, selection, use, and performance of electrical tools and equipment with their uses and limitations.

5. Occupational safety personnel shall demonstrate an expert-level knowledge hazard analysis techniques and the application of hazard control methods and abatement activities.

Supporting Knowledge and/or Skills

a. Describe the preferred hierarchy of hazard control methods.

b. Identify common types of engineering and administrative controls and discuss the applicability of each.

c. Outline appropriate actions when responding to the report or discovery of an imminent danger situation.

d. Define the elements and appropriate application of a hazard abatement program.

e. Outline benefits of applying hazard analysis techniques during the design phase of a facility, operation, process, or piece of equipment.

f. Analyze a given identified hazard and recommend acceptable control measures, including, informing, posting, and abatement.

g. Discuss importance of informing affected workers of hazard(s), abatement activities, and other related activities.

h. Identify circumstances and trade-offs warranting PPE use as a hazard-control method.

i. Describe various types and intended functions of PPE.

j. Describe an effective non-electrical lockout/tagout program and application.

k. Discuss effective use and application of a job safety analysis system.

l. Describe applicability and purpose of nuclear and non-nuclear hazard analysis techniques required during the life cycle of a DOE facility.

m. Discuss the need for, and the selection and performance of, the applicable qualitative and quantitative techniques of system safety analysis, such as the following:

- Preliminary hazard analysis
- Fault tree analysis
- Failure modes and effects analysis
- Energy trace and barrier analysis
- Operating and support hazard analysis
- System/subsystem hazard analysis
- Process hazard analysis.

n. Describe and demonstrate understanding of the Integrated Safety Management approach. Discuss objectives, core functions, and guiding principles approach to systematically integrate safety into management and work practices at all levels.

6. Occupational safety personnel shall demonstrate a working-level knowledge of safety in construction operations.

Supporting Knowledge and/or Skills

a. Discuss the role of safety and health during project planning and analysis.

b. Describe safety program considerations at multi-employer construction sites.

c. Discuss requirements for, and purpose and application of, appropriate preliminary and activity hazard analysis.

d. Demonstrate the ability to perform the following:

- Evaluate construction operations and identify construction-related hazards
- Identify, interpret, and apply appropriate construction-safety requirements
- Identify and implement appropriate control measures.

e. Identify excavation and trenching hazards and control considerations including the following:

- Factors affecting soil stability in a trench
- Application of different types of shoring, sloping, and shielding systems

- Excavation and trenching inspection considerations
- Soil types and test for determining same.

f. Discuss the following hazard control considerations associated with demolition operations:

- Structural support considerations
- Project planning and activity hazard analyses
- Hazards associated with debris and appropriate removal techniques
- Hazards associated with remaining energy sources, equipment, and materials (hazardous chemicals/wastes).

g. Describe construction-related heat and cold stress hazards and identify appropriate control measures.

h. Discuss hazards and identify appropriate controls associated with construction equipment and operations including, but not limited to, the following:

- Scaffolding and other elevated work structures or platforms
- Tools, hand and power
- Heavy equipment (e.g., earth-moving equipment) and traffic
- Placement and temporary support of walls, floors, and other structures.

i. Identify hazards related to new construction (e.g., steel erection, masonry work, fall protection, wood framing, and shoring).

7. Occupational safety personnel shall demonstrate a working-level knowledge of accident/incident investigation, analysis, and reporting as it is practiced within DOE.

Supporting Knowledge and/or Skills

a. Describe purpose of accident/incident investigations within DOE.

b. Discuss and demonstrate ability to apply criteria for determining the need for a particular type of accident/incident investigation.

c. Describe accident causation models, emphasizing the importance of human reliability and effective management systems.

d. Discuss and apply necessary techniques for gathering facts applicable to an investigation and interviewing witnesses.

e. Discuss and apply necessary analysis techniques used in accident investigations, such as management oversight and risk tree; change analysis; events and causal factor analysis; energy trace and barrier analysis; and basic tree analysis.

f. Describe purpose and content of an accident investigation report.

g. Discuss importance of providing feedback on accident investigations, and describe the management systems necessary to ensure this feedback is communicated to DOE.

h. Describe and understand the importance of securing the accident scene, preserving evidence, and rules of conduct.

i. Describe and understand the importance of reporting between contractors and Federal workers and have a working knowledge of various reporting systems, requirements and investigations.

8. Occupational safety personnel shall demonstrate a working-level knowledge of the purpose, general content, development, and performance of worker occupational safety training.

Supporting Knowledge and/or Skills

a. Identify safety-training requirements addressed in applicable regulations or DOE Orders.

b. Discuss basics of training development techniques, emphasizing the importance of using behavioral objectives.

c. Discuss considerations that must be addressed in the development of a training course. Describe the various types (and uses) of training material and techniques.

d. Discuss basics of evaluating a training course or program and the importance of, and methods for, evaluating occupational safety training effectiveness.

e. Describe the role and limitations of worker training in a comprehensive safety program.

f. Discuss methods to conduct workplace evaluations and communicate results to workers.

g. Describe the role and value of a Job Safety Analysis as a training tool.

h. Identify the key elements of HAZWOPER training as defined in 29 CFR 1910.120, Appendix E.

9. Occupational safety personnel shall demonstrate a working-level knowledge of the Vehicle Safety Program.

Supporting Knowledge and/or Skills

a. Identify safe driving and defensive-driving techniques.

b. Discuss pre- and post-driving vehicle inspections.

c. Discuss how the application and use of control measures, equipment, road conditions, barriers, and non-communication devices are effected by environmental conditions.

d. Identify the purpose and process of training in accident/incident investigation.

e. Discuss actions and procedures for reporting a vehicle accident or property damage.

10. Occupational safety personnel shall demonstrate a working-level knowledge of the requirements and methods to maintain communication with DOE-Headquarters, field elements (including contractors), other Federal agencies, and regulatory agencies.

Supporting Knowledge and/or Skills

a. Describe the DOE's organization and discuss DOE's procedures for communicating between DOE-Headquarters and Field Elements.

b. Describe DOE's procedures and policies (including form Memorandums of Understanding) for communicating with OSHA, the Bureau of Labor Statistics, the National Institute for Occupational Safety and Health, and other regulatory agencies.

c. Define the respective jurisdictions of DOE and OSHA concerning occupational safety and health matters on DOE work sites.

d. Describe the importance of requiring the proper skill levels of knowledge for each of the occupational safety work areas listed in the Occupational Safety Qualification Standard.

11. Occupational safety personnel shall demonstrate a working-level knowledge of the development and management of both the technical and programmatic elements of an occupational safety program.

Supporting Knowledge and/or Skills

a. Discuss function of a safety program.

b. Discuss general principles of management applicable to the organization of the safety function, safety program planning, safety program evaluation, and communications with labor, management, and the public.

c. Describe the role and significance of the following major elements in a successful safety program:

- Positive management leadership
- Assignment of safety management roles, authorities, accountabilities, and responsibilities
- Formal statement of policy
- Maintenance of safe working conditions
- Establishment of control and prevention programs
- Worksite analysis
- Training
- Employee involvement
- Program and work area assessments.

d. Describe importance of and methods for establishing, updating, and measuring program performance against safety program goals and objectives.

e. Identify common safety program performance indicators.

f. Discuss safety program funding and human resource issues that must be considered in both short and long-term plans and budgets.

g. Describe role, contents, and significance of a written safety program document.

h. Discuss importance of employee participation in the implementation of the safety programs and identify potential methods to ensure or encourage involvement.

i. Identify and discuss application of criteria in the Environment, Safety and Health Management Plan for occupational safety.

j. Identify methods to evaluate and develop health and safety programs and plans, including the Voluntary Protection Program and Integrated Safety Management.

12. Occupational safety personnel shall demonstrate a working-level knowledge of assessment techniques applicable to occupational safety, reporting results, abatement of hazard, and following up on actions taken as the result of assessments.

Supporting Knowledge and/or Skills

a. Describe roles and responsibility of occupational safety personnel with respect to oversight of Government-Owned Contractor-Operated facilities.

b. Describe methods for, and the role and performance of, fact-finding interviews during an occurrence investigation.

c. Explain essential elements of a performance-based assessment including the areas of investigation, fact-finding and reporting, including a follow-up closure of assessment.

d. Describe the necessary content and format of an assessment report addressing occupational safety.

13. Occupational safety personnel shall demonstrate a working-level knowledge of fire hazards and the principles and methods of fire prevention and protection.

Supporting Knowledge and/or Skills

a. Discuss fire chemistry (i.e., four required elements) and role of this chemistry in fire prevention and protection efforts.

b. Describe workplace and facility inspection procedures necessary to identify fire hazards and assess the status of compliance with applicable regulations.

c. Describe fire protection considerations that must be addressed in the review of proposed or existing processes and operations, and identify appropriate control measures.

d. Discuss need to develop, maintain, and implement work procedures that focus on the prevention of fires and explosions, such as hot-work permits, fire watches, and proper handling and storage of flammable materials.

e. Discuss and assess applicability of fire detection system requirements.

f. Discuss and assess applicability of portable and fixed-fire suppression equipment requirements.

g. Discuss and assess application of requirements related to basic design principles in the National Fire Protection Association 101, Life Safety Code, including emergency egress, evacuation, and other related program elements.

h. Discuss role and purpose of fire protection design considerations including fireproof and fire-resistant structures, firewalls, and fire curtains.

i. Discuss health and safety hazards of currently employed fire suppressant systems.

j. Discuss and have working knowledge of welding safety, including confined spaces.

k. Discuss first aid treatment for various burn types (e.g., electrical, fire, heat, and chemical).

l. Discuss role of fire fighters and their required training.

14. Occupational safety personnel shall demonstrate a working-level knowledge of ergonomic hazards and elimination or control of them.

Supporting Knowledge and/or Skills

a. Discuss basic ergonomics terminology.

b. Describe ergonomic considerations that must be addressed when evaluating new or existing jobs, processes, or operations, and identify appropriate methods for the elimination or control of ergonomic hazards.

c. Explain application of “single risk factors” for ergonomic hazards.

d. Discuss methodology for analyzing lifting tasks.

e. Discuss significance of repetitive motions and tasks.

f. Discuss importance of worker interfaces with operational equipment.

g. Discuss significance and definition of workplace tasks related to ergonomic consequences.

h. Discuss methods to conduct workplace evaluations and communicate results to workers and management.

15. Occupational safety personnel shall demonstrate a working-level knowledge of safety precautions and hazards associated with workplace chemicals and physical agents.

Supporting Knowledge and/or Skills

a. Discuss hazards associated with the following chemical types:

- Corrosives
- Flammable, combustible, and explosive materials
- Oxidizers
- Cryogenic liquids
- Toxic chemicals
- Oxygen-displacing chemicals.

b. Discuss terminology associated with toxic chemical effects.

c. Describe general safety precautions that must be implemented or observed during the use, handling, storage, transportation, and disposal of each type of hazardous chemical listed above.

d. Describe safety precautions specific to the use, handling, storage, and disposal of flammable and combustible liquids.

e. Describe relationships and hazards associated with chemicals in a confined space entry and how their presence could dictate the confined space designation. Describe a proper confined space program including entry precautions and procedures.

f. Discuss hazards associated with chemical incompatibilities and need for segregation and containment.

g. Discuss first aid and emergency response considerations for operations involving hazardous chemicals.

h. Describe methods by which toxic compounds may enter the body and the control mechanisms available to block these routes of entry.

i. Analyze processes or operations to identify potential chemical hazards and appropriate control measures.

j. Describe general considerations for the storage and use of different classes of explosives and blasting agents, including the construction, capacity, and placement of facilities or operations.

k. Discuss use of and considerations regarding chemical monitoring and sampling techniques.

l. Discuss other aspects of physical agents (e.g., noise, lasers, hot/cold, and radio frequency waves) in the working environment, and associated procedures, precautions, and controls.

m. Discuss major elements of a hazard communication program, laboratory safety program, and process safety management program.

16. Occupational safety personnel shall demonstrate a working-level knowledge of the use and function of worker protection safety testing and measurement equipment.

Supporting Knowledge and/or Skills

a. Discuss use, limitation, and function of worker protection safety testing equipment (e.g., oxygen meters, explosive atmosphere meters, electrical test equipment, illumination meters, and calipers).

b. Discuss need for proper equipment maintenance and calibration.

c. Describe circumstances requiring use of each type of equipment.

d. Describe appropriate actions taken in response to various readings from each type of equipment.

e. Describe appropriate application and function of industrial hygiene monitoring and sampling equipment and discuss required safety interfaces.

17. Occupational safety personnel shall demonstrate a familiarity level knowledge of the following disciplines that interface with occupational safety:

- Health physics
- Industrial hygiene
- Occupational medicine
- Safeguards and security

- Environmental protection
- Nuclear safety.

Supporting Knowledge and/or Skills

a. Discuss applicability of occupational safety and health criteria in DOE Orders to nuclear safety.

b. Describe potential impact of nuclear safety requirements on occupational safety matters and discuss need for coordination between occupational safety professionals and health physicists.

c. Discuss applicable “safety and analysis” and “review system criteria” for nuclear facilities.

d. Discuss industrial hygiene fundamentals in terms of the following:

   - Basic terminology
   - Nature, recognition, evaluation and control of hazards
   - Necessary elements for implementing and maintaining an effective industrial hygiene program.

e. Discuss relationship and need for coordination that exists between the disciplines of occupational safety, industrial safety, health physics, and occupational medicine.

f. Discuss DOE's occupational medicine program requirements and their applicability/interface with occupational safety program requirements.

g. Discuss general requirements of DOE's environmental protection program and describe how these requirements interface with the occupational safety program.

h. Discuss interface with, and the general requirements for, DOE's Safeguards and Security Program.

i. Discuss existing interface between occupational safety personnel and safeguards and security personnel, including situations where security considerations conflict with personnel safety (e.g., locked fire exits, security barriers creating tripping hazards).

18. Occupational safety personnel shall demonstrate familiarity with the application of basic and applied sciences to safety considerations.

Supporting Knowledge and/or Skills

a. Discuss role of mathematical tools (e.g., algebra, trigonometry, calculus, statistics, and symbolic logic) in the safety field in analyzing quantities, magnitudes, and probabilities.

b. Discuss physics laws associated with mechanics, heat, light, sound, electricity, magnetism, and radiation and application of these laws in the safety field.

c. Discuss basic chemistry concepts including atomic structure, bonding, states of matter, chemical energy and equilibrium, and chemical kinetics.

d. Discuss biological sciences including heredity, diversity, reproduction, development, structure, and function of cells, organisms, and populations, with emphasis on human biology.

e. Discuss behavioral sciences including individual differences, attitudes, learning, perception, and group behavior and application of these in the safety field.

f. Discuss general engineering and technology disciplines including applied mechanics, properties of materials, electrical circuits and machines, principles of engineering design and drawings, and computer science.

19. Occupational safety personnel shall demonstrate familiarity with the knowledge of safety in the research and development, manufacture, use, transportation, testing, demilitarization, storage and disposal of explosives.

Supporting Knowledge and/or Skills

a. Discuss major principles of personnel protection from explosive hazards and the application of each principle to explosives operations.

b. Describe types, purpose, and application of personal protective clothing and equipment for explosives operations.

c. Discuss and demonstrate ability to apply quantity-distance criteria to explosives operations.

d. Discuss hazards associated with uncontrolled electrical sources (e.g., static electricity and lightning) and application of required controls such as the following:

- Lightning protection
- Nonsparking tools
- Conductive footwear and floors
- Equipment bonding and grounding.

e. Discuss fire protection considerations for explosives operations.

f. Describe role of hazard analysis and planning techniques for designing or evaluating explosives operations and storage.

g. Discuss importance of development, implementation, and maintenance of safe work procedures for explosives operations and storage.

20. Occupational safety personnel shall demonstrate familiarity with the knowledge of firearms safety.

Supporting Knowledge and/or Skills

a. Identify PPE necessary during firearms use.

b. Discuss firing-range safety considerations including required procedures and controls.

c. Discuss principles of firearms safety and describe appropriate and mandated controls.

d. Discuss industrial hazards (e.g., noise and lead exposures) associated with firing ranges and describe appropriate control measures.

e. Describe and apply firearms safety precautions associated with DOE safeguards and security operations and exercises.

21. Occupational safety personnel shall demonstrate a familiarity level knowledge of DOE contract management and administration sufficient to appraise, assist, or direct contractor organizations in the area of occupational safety.

Supporting Knowledge and/or Skills

a. Discuss key elements of contractual relationships between DOE and contractors and the process for preparing cost estimates and budgets.

b. Describe the role of DOE's occupational safety professional with respect to the evaluation of contractor occupational safety programs for the cost-plus award fee process or other performance-rating processes.

c. Describe responsibilities of a DOE occupational safety professional associated with contractor compliance with the *Price Anderson Amendments Act.*

d. Using actual or hypothetical data for an occupational safety program, discuss the program's budget, schedule, appropriateness, and impact on occupational health protection.

e. Identify appropriate contract mechanisms and channels that must be employed or considered when communicating with or directing DOE contractors (e.g., describe appropriate procedures and considerations for issuing a stop work order to a DOE contractor).

APPENDIX - CONTINUING TRAINING AND PROFICIENCY REQUIREMENTS

Occupational safety personnel shall participate in an office/facility/position-specific continuing training and qualification program that includes the following elements:

1. Technical education and/or training covering topics directly related to assigned duties and authorities/responsibilities of occupational safety personnel. This may include courses and/or training provided by the following:
   - DOE
   - Other government agencies
   - Outside vendors
   - Educational institutions
   - Outside contacts
   - Professional societies/organizations (e.g., American Society of Safety Engineers, American Industrial Hygiene Association or the Voluntary Protection Program Participants Association).

2. Continuing education designed to ensure that occupational safety personnel remain current on changes and improvements in the field of occupational safety.

3. Training in areas added to the Occupational Safety Functional Area Qualification Standard since initial qualification.

4. Specific continuing training requirements shall be documented in Individual Development Plans as required by the U.S. Office of Personnel Management.

5. Specific care shall be taken to ensure that all training be approved by the appropriate professional organization to control the quality and relevance of the training.

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CONCLUDING MATERIAL

Review Activity:

DOE

DP-NNSA
EH
EM
NE
NN-NNSA
SC
FE
RW

Field and Operations Offices

AL
CH
ID
Fernald
NV
OAK
OH
OR
RF
RL
SF
SR
Carlsbad Field Office (CBFO)
Office of River Protection

Area Offices

Amarillo Area Office
Argonne Area Office
Brookhaven Area Office
Fermi Area Office
Kirtland Area Office
Los Alamos Area Office
Princeton Area Office
Rocky Flats Area Office
Y-12 Area Office

Preparing Activity:
DOE-EH-53

Project Number:
TRNG-0019