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DOE-STD-1175-2006  
October 2006

# DOE STANDARD

## SENIOR TECHNICAL SAFETY MANAGER FUNCTIONAL AREA QUALIFICATION STANDARD

DOE Defense Nuclear Facilities Technical Personnel



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

**AREA TRNG**

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## APPROVAL

The Federal Technical Capability Panel consists of U.S. Department of Energy Senior Technical Safety Managers (STSM) 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.



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Roy J. Schepens, Chairman  
Federal Technical Capability Panel

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## ACKNOWLEDGMENT

The U.S. Department of Energy, Office of Environment, Safety and Health, Office of Facility Safety is the Sponsor for the Senior Technical Safety Manager (STSM) Qualification Standard. The Sponsor is responsible for coordinating the development and/or review of the Functional Area Qualification Standard by subject matter experts to ensure that the technical content of the standard is accurate and adequate for Department-wide application for those involved in the STSM program. 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 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**

**Senior Technical Safety Manager**

A Senior Technical Safety Manager (STSM) is usually at the GS/GM-15, Excepted Service IV or V or Senior Executive Service level and assigned the direct responsibility to manage technical programs, resources, and/or Department personnel who provide assistance, direction, guidance, oversight, or evaluation of contractor technical activities impacting the safe operation of defense nuclear facilities.

**PURPOSE**

DOE Manual (M) 426.1-1A, Federal Technical Capability Manual, commits the Department to continuously strive for technical excellence. The Technical Qualification Program (TQP), along with the supporting technical 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 qualification standards should be aligned with and integrated into the recruitment and staffing processes for technical positions. The technical qualification standards should form 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 qualifications standards will be greatly enhanced by application of appropriate materials from the technical Functional Area Qualification Standards (FAQS).

The technical qualification standards are not intended to replace the OPM qualifications standards nor other Departmental personnel standards, rules, plans, or processes. The primary purpose of the TQP is to ensure that employees have the requisite technical competency to support the mission of the Department. The TQP forms the basis for the development and assignment of DOE personnel responsible for ensuring the safe operation of defense nuclear facilities.

**APPLICABILITY**

The STSM FAQS establishes common functional area competency requirements for all DOE STSMs who provide assistance, direction, guidance, oversight, or evaluation of contractor technical activities that could impact the safe operation of DOE's defense nuclear facilities. The technical FAQS has been developed as a tool to assist DOE Program and Field offices in the development and implementation of the TQP in their organization. For ease of transportability of qualifications between DOE elements, Program and Field offices are expected to use this technical FAQS without modification or additions. Needed additional office/site/facility specific technical competencies should be handled separately. Satisfactory and documented attainment of the competency requirements contained in this technical FAQS ensures that STSMs possess the minimum requisite competence to fulfill their functional area duties and responsibilities common to the DOE Complex. Additionally, Office/facility-specific qualification standards

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supplement this technical FAQs and establish unique operational competency requirements at the Headquarters or Field element, site, or facility level.

It should be noted that the competency elements of management and leadership, general technical knowledge, regulations, administrative capability and assessment and oversight are all embodied in the competencies listed in this Standard. All of the factors above have a bearing on safety. Although the focus of this Standard is technical competence, elements, such as, good communication, recognized credibility, ability to listen and process information, and the ability to guide an effort to get it right the first time are recognized as important aspects of safety.

### IMPLEMENTATION

This technical FAQs identifies the minimum technical competency requirements for DOE personnel. Although there are other competency requirements associated with the positions held by DOE personnel, this FAQs 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 described by a listing of supporting knowledge and/or skill statements, which although not required, do describe the intent of the competency statement(s). In selected competencies, expected knowledge and/or skills have been designated as "Mandatory Performance Activities." In these competencies, the actions are not optional.

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 recognize the need to seek and obtain appropriate expert advice (e.g., technical, legal, safety) or consult appropriate reference materials 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 DOE personnel possess the competencies required of their position. That includes the competencies identified in this technical FAQs. Documentation of the completion of the requirements of the Standard shall be included in the employee's training and qualification record.

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Equivalencies should be used sparingly and with the utmost rigor and scrutiny to maintain the spirit and intent of the TQP. Equivalencies may be granted for individual competencies based on objective evidence of previous education, training, certification, or experience. Objective evidence includes a combination of transcripts, certifications, and in some cases, a knowledge sampling through a written and/or oral examination. Equivalencies shall be granted in accordance with the TQP Plan of the Site/Office/Headquarters organization qualifying the individual. The supporting knowledge and/or skill statements and Mandatory Performance Activities should be considered before granting equivalency for a competency.

Training shall be provided to employees in the TQP who do not meet the competencies contained in the technical FAQs. Training may include, but is not limited to, formal classroom and computer-based courses, self-study, mentoring, on the job training, and special assignments. Departmental training will be based on 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 used to provide individuals with the requisite knowledge and/or skill required to meet the technical FAQs competency statements.

### EVALUATION REQUIREMENTS

Attainment of the competencies listed in this technical FAQs shall be documented in accordance with the TQP Plan or Policy of the Site/Office/Headquarters organization qualifying the individual.

### INITIAL QUALIFICATION, REQUALIFICATION, AND TRAINING

Qualification of STSMs shall be conducted in accordance with the requirements of DOE M 426.1-1A.

DOE Program Managers, Site/Service Center Managers or NNSA Deputy Administrators shall require personnel filling STSM positions to requalify every five (5) years. The DOE STSM Departmental Sponsor/Lead FTCP Agent shall establish the specific requalification training designed to update and maintain the qualifications of STSMs. DOE Program Managers, Site/Service Center Managers, or NNSA Deputy Administrators shall document the requalification process which shall, at a minimum include the following:

1. Items added to the STSM FAQs since the individual's last qualification or requalification.
2. A combination of written examinations, oral examination, or facility/site walkthroughs, as necessary, to demonstrate competency on the new material and those areas from the initial qualification where the STSM has not demonstrated ongoing experience during the past five (5) years.

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DOE 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:

- DOE
- Other government agencies
- Outside vendors
- Educational institutions

Beyond formal classroom or computer-based courses, continuing training may include:

- Self-study
- Attendance at symposia, seminars, exhibitions
- Special assignments
- On-the-job experience

A description of suggested learning activities and the requirements for the continuing education and training program for STSMs are included in Appendix A of this document.

## DUTIES AND RESPONSIBILITIES

The following are the typical duties and responsibilities expected of personnel assigned to the STSM Functional Area:

1. Integrate safety into management and work practices to accomplish mission objectives, while ensuring worker and public health and safety, and the protection of the environment. This includes assuring that safety is fully integrated into design and construction early in a project.
2. Comply with Departmental directives, Federal and State regulations and other binding agreements.
3. Direct and provide support, and allocate resources to meet the Department's mission safely.
4. Manage people, implement policies and procedures, perform technical reviews, and provide technical direction and feedback to contractor and federal employees.
5. Integrate monitoring and assessment activities and provide feedback to the contractors.
6. Recruit, select, train, and qualify employees to establish and maintain technical competence.
7. Effectively communicate technical safety expectations and issues.

Position-specific duties and responsibilities for STSMs are contained in their Office/facility-specific qualification standard and/or position description.

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## BACKGROUND AND EXPERIENCE

The OPM 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 STSMs are:

1. Education:

An STSM shall possess a scientific or engineering degree with a major in an academic area that supports the functional responsibilities of the position. (Exceptions to this requirement should be considered only in rare circumstances, and then in accordance with OPM Qualification Standards Handbook.) An advanced technical degree is considered to be an advantage. Additionally, professional credentials (e.g., Professional Engineer) and industry certifications are desirable.

2. Experience:

STSMs should show a demonstrated capability to manage technical issues at the level the position requires. For example, for a management position that is narrow in scope with significant detail work, the STSM shall have a level of expertise close to that of a subject matter expert. For a management position that is very broad in scope, STSMs shall possess an interdisciplinary background, and shall also have demonstrated technical competence in a specific area at a previous point in their careers. For supervisory or managerial positions, STSMs should also have demonstrated leadership skills. Previous or current experience as a qualified DOE Facility Representative, Safety System Oversight, Industry (Architect Engineering or Nuclear Steam Supply System) or Commercial Nuclear Utility Technical or Project Manager, Senior Reactor Operator (Licensed or Certified), Nuclear Regulatory Commission Senior Resident Inspector, or equivalent position shall be considered highly beneficial.

There may be situations where the incumbent in an identified senior technical safety management position does not meet the education and experience requirements as discussed above. In these cases, management has various options to address or compensate for this situation. In developing and implementing compensatory measures, it should be recognized that management has the responsibility to create a situation where there is an unbroken chain of fully qualified STSMs in positions of authority. Examples of various options for compensatory measures can be found in DOE M 426.1-1A.

## REQUIRED TECHNICAL COMPETENCIES

The competencies contained in this Standard are distinct from those competencies contained in the General Technical Base Qualification Standard. All STSMs must satisfy the competency requirements of the General Technical Base Qualification Standard prior to or in parallel with 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 Standard. Each of the competency statements is further described by a listing of supporting knowledge and/or skill statements, which although not requirements, do describe the

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intent of the competency statement(s). In selected competencies, expected knowledge and/or skills have been designated as “Mandatory Performance Activities.” In these competencies, the actions are not optional.

**Note:** When regulations, DOE directives, or other industry standards are referenced in the FAQs, the most recent revision should be used.

**1. An STSM shall demonstrate the ability to effectively communicate technical safety expectations and issues, both orally and in writing.**

Supporting Knowledge and/or Skills:

- a. Discuss the means of developing and/or enhancing alliances with external groups (e.g., other agencies and governments, U.S. Congress, and clientele groups).
- b. Represent and speak for the organizational unit on safety management issues (e.g., presenting, explaining, selling, defending, and negotiating) to those inside and outside the Department.
- c. Discuss the benefits to safety management of promoting effective communication and exchange across the Department including:
  - Focused sharing of information;
  - Interaction and resolution of issues; and
  - Use of lessons learned.
- d. Describe how the following expectations are effectively communicated within an organization to build a continuous improvement culture:
  - Development and exploration of new ideas are encouraged;
  - Process quality and safety responsibilities within the organization are understood;
  - Individuals know how their work contributes to safety objectives and strategic goals;
  - Unsafe practices, nonconforming items and potential areas for improvement are readily identified; and
  - Enhanced product and process safety and reliability are emphasized.
- e. Prepare and present a briefing to senior management or stakeholders on the state of safety for a given facility or site.

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2. **An STSM shall have a working level knowledge of the policies and procedures used to recruit, select, train, and qualify employees to establish and maintain technical competency.**

Supporting Knowledge and/or Skills:

- a. Discuss planning, recruitment, and selection processes that can be used to acquire a technically competent workforce with the necessary knowledge, skills, abilities, and/or potential to accomplish the goals of the organization.
- b. Discuss the parameters of the Excepted Service Authority (ies), the circumstances which would dictate use of an Excepted Service Authority, and the process and procedures for using an Excepted Service Authority to recruit and hire.
- c. Discuss ways to motivate, reward, recognize, and retain excellent employees or recognize a major contribution to the organization using local rewards programs or programs described in the Departmental *Administrative Flexibilities* guide.
- d. Discuss the roles and responsibilities of the FTCP Panel and Panel Agents in the recruitment, selection, training, and retention of technical personnel.
- e. Describe methods used to assess an employee's unique developmental needs and why providing developmental opportunities to employees could contribute to the achievement of organizational goals.
- f. Describe in general, the training and qualification requirements for contractors specified in DOE O 5480.20A, *Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities*.
- g. Discuss the responsibilities of DOE elements in meeting the requirements for the Technical Qualification Program as described in DOE M 360.1-1B.
- h. Describe the Federal Technical Capability Program as defined in DOE M 426.1-1A, *Federal Technical Capability Manual*, and discuss that application of the program in your organization.
- i. Describe the following three types of mentoring relationships and discuss the types of goals that an organizationally sponsored mentoring program is intended to meet:
  - Supervisor;
  - Informal; and
  - Structured-Facilitated.
- j. Discuss the benefits to the Department and individual organizational units which could be realized through use of the following:
  - Mentoring Program; and
  - Special assignment/detail.

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- k. Describe the process to obtain technical assistance and the types of assets available.
- l. Describe the process for enrolling or participating in the Department's technical assistance units.
- m. Describe the process for obtaining the technical assistance of an individual from another office on a temporary or detail basis.
- n. Describe other Departmental capabilities/resources that could be utilized to solve short-term technical safety issues.
- o. Conduct a workforce analysis to determine the gap in needed critical technical competencies for a given facility or site.
- p. Participate as member of an oral examination board for qualification in a TQP functional area.
- q. Review and evaluate the succession plan for a given facility or site.
- r. Lead or participate in a self-assessment of the implementation of an organization's technical qualification program in accordance with DOE M 426.1-1A.

**3. An STSM shall have a working level knowledge of the INPO *Principles for a Strong Nuclear Safety Culture* and their application to DOE.**

Supporting Knowledge and/or Skills:

- a. Compare, contrast, and describe organizational culture, safety culture, and safety conscious work environment as they relate to nuclear missions in DOE.
- b. Identify and discuss the safety culture lessons learned from the Columbia Space Shuttle Accident and their applicability to DOE.
- c. Identify and discuss the safety culture lessons learned from the Davis-Besse Reactor Vessel Head Degradation Incident and their applicability to DOE.
- d. Given a scenario, analyze, identify, and describe potential signs of a strong or weak safety culture within an organization.
- e. Explain how INPO Safety Culture Principles are applied for a given organization and its associated mission in DOE.



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4. **An STSM shall have a working level knowledge of the mechanisms used to develop, approve, implement, and improve contractor Integrated Safety Management (ISM) systems.**

Supporting Knowledge and/or Skills:

- a. Describe the overall objective of the Department-wide DOE M 411.1-1C, *Safety Management Functions, Responsibilities, and Authorities Manual* and the similar lower-tier organization-level manuals developed by Headquarters Offices and Field elements.
- b. Give an example of a circumstance that might make it necessary or reasonable to deviate from the responsibilities and authorities identified in the Functions, Responsibilities, and Authorities Manual and describe the exemption process in DOE M 251.1-1A, *Directives System Manual*.
- c. Discuss in detail the requirements contained in Department of Energy Acquisition Regulations (DEAR) Clauses 970.5223-1, *Integration of Environment, Safety and Health into work planning and execution*, DEAR 970.5204-2, *Laws, Regulations and DOE Directives*, and DEAR 970.5215-3, *Conditional Payment of Fee*.
- d. Discuss in detail the process used to review and approve contractor ISM System Descriptions.
- e. Discuss the implementing mechanisms, including work planning and control, contained in the contractor's approved ISM System Description.
- f. Discuss in detail the DOE mechanisms used to oversee implementation of the contractor's ISM System Description.
- g. Discuss the process used to maintain and update the contractor's approved ISM System Description.
- h. Describe the approach used to assess the effectiveness of the contractor's approved ISM System.
- i. Discuss the process used to develop and approve contractor annual ISM performance objective, measures, and commitments.

Mandatory Performance Activities:

- a. Lead or participate in an assessment of a site or facility's implementation of Integrated Safety Management.

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5. **An STSM shall have a working level knowledge of the DOE Principles of Human Performance Improvement described in the Human Performance Fundamentals Course (National Academy for Nuclear Training).**

Supporting Knowledge and/or Skills:

- a. Explain the significance of human error in the incidences of occurrences and events.
- b. Name three of the five principles of human performance and provide a workplace example of each principle in action.
- c. Explain how individual behavior affects the frequency and severity of an occurrence or an event.
- d. Given an accident scenario, explain how latent errors in the organization affect the active errors and mistakes that lead to an accident.

6. **An STSM shall have a working level knowledge of the content of the safety basis requirements, as described in 10 Code of Federal Regulations (CFR) 830, Subpart B, and the related DOE orders, standards, and guides.**

Supporting Knowledge and/or Skills:

- a. Discuss the purpose and objectives of the nuclear facility safety basis program.
- b. Discuss each of the following nuclear safety orders, standards, guides, and handbooks and relate each of them to establishing and maintaining the safety basis requirements for a given facility:
  - DOE O 420.1A, *Facility Safety*;
  - DOE G 421.1-2, *Implementation Guide For Use in Developing Documented Safety Analyses to Meet Subpart B of 10 CFR 830*;
  - DOE G 423.1-1, *Implementation Guide For Use In Developing Technical Safety Requirements*;
  - DOE G 424.1-1, *Implementation Guide For Use In Addressing Unreviewed Safety Question Requirements*;
  - DOE O 425.1C, *Startup and Restart of Nuclear Facilities*;
  - DOE O 460.1B, *Packaging and Transportation Safety*;
  - DOE G 460.1-1, *Implementation Guide for Use with DOE O 460.1A, Packaging and Transportation Safety*;
  - DOE-STD-1020-2002, *Natural Phenomena Hazards Design and Evaluation Criteria for Department of Energy Facilities*;
  - DOE-STD-1021-93, *Natural Phenomena Hazards Performance Categorization Guidelines for Structures, Systems, and Components [SSCs]*;
  - DOE-STD-1022-94, *Natural Phenomena Hazards Characterization Criteria*;

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- DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Reports [SAR];*
  - DOE-STD-1083-95, *Requesting and Granting Exemptions to Nuclear Safety Rules;*
  - DOE-STD-1104-96, *Review and Approval of Nonreactor Nuclear Facility Safety Analysis Reports;*
  - DOE-STD-1120-2005, *Integration of Environment, Safety, and Health into Facility Disposition Activities, Volumes 1 and 2;*
  - DOE-STD-1186-2004, *Specific Administrative Controls;*
  - DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Safety Analysis Reports;*
  - DOE-HDBK-3010-94, *Airborne Release Fractions/Rates and Respirable Fractions for Nonreactor Nuclear Facilities;*
  - DOE-STD-3011-2002, *Guidance For Preparation Of Basis For Interim Operation (BIO) Documents;*
  - DOE-EM-STD-5502-94, *Hazard Baseline Documentation;*
  - 10 CFR 820, *Procedural Rules for DOE Nuclear Activities;* and
  - 10 CFR 830, Subpart B, *Safety Basis Requirements.*
- c. Discuss the development and maintenance of the requirements described in 10 CFR 830, Subpart B, *Safety Basis Requirements,* for DOE and contractors authorized to operate nuclear facilities.
- d. Discuss the following items in the context of safe operation of a nuclear facility:
- Authorization Agreements;
  - Authorization Basis;
  - Documented Safety Analysis;
  - Fire Hazard Analysis;
  - Graded approach;
  - Limiting conditions for operation;
  - Limiting control setting;
  - Operational Readiness Review;
  - Preliminary Documented Safety Analysis;
  - Potential Inadequacies of the Safety Analysis (PISA);
  - Readiness Assessment;
  - Safety Significant Components (SSCs);
  - Safe Harbor Methodologies;
  - Safety Analysis Report for Packaging;
  - Safety Basis;
  - Safety Class SSCs;
  - Safety Evaluation Report;
  - Safety limit;
  - Safety significant SSCs;
  - Shipper Receiver Agreements;

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- Specific Administrative Controls;
  - Startup Notification Report;
  - Surveillance requirements;
  - TSR;
  - Design Basis; and
  - USQ process.
- e. Describe how the TSR is derived, how it is used, and what constitutes a violation.
- f. Discuss the hazard categorization levels, chemical hazard classification levels, and the process utilized to determine the facility hazard category or classification.
- g. Discuss the reasons for performing a USQ determination.
- h. Discuss the responsibilities of DOE and contractors authorized to operate nuclear facilities for the performance of USQ determinations.
- i. Discuss the actions to be taken by a contractor and DOE upon identifying information that indicates a potential inadequacy of the safety analysis.
- j. Discuss the actions to be taken by a contractor and DOE if it is determined that a PISA exists.
- k. Describe the safety basis documents for the facilities in the STSM's organization and how they are prepared, reviewed, approved, and updated:
- The safety basis documents for the facilities under the purview of the STSM's organization;
  - The scope of operations, hazards, postulated accidents, and controls/requirements for the assigned facilities as documented in the safety basis documents;
  - The safety basis documentation preparation, revision, and update processes and the associated responsibilities of the contractor and DOE;
  - The review and approval processes for safety basis documents and the associated responsibilities of the contractor and DOE;
  - The level of approval authority as it relates to Facility Hazard Categorization and Classification and safety basis documents;
  - The steps in the preparation, review, and approval of a safety evaluation report;
  - The process for flow down of controls and requirements and the derived operating procedures, processes, and programs; and
  - Identify the conditions and procedures used to maintain and modify safety documents.

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- I. Discuss the purpose, content, and philosophy, as appropriate to the position, of the following safety management standards for nuclear explosive safety:
- DOE O 452.1B, *Nuclear Explosive and Weapons Surety Program*;
  - DOE O 452.2B, *Safety of Nuclear Explosive Operations*;
  - DOE O 461.1A, *Packaging and Transfer or Transportation of Materials of National Security Interest*;
  - DOE O 5610.13, *Joint Department of Energy/Department of Defense Nuclear Weapon System Safety, Security, and Control Activities*; and
  - DOE O 5660.1B, *Management of Nuclear Materials*.

### Mandatory Performance Activities:

- a. Review and evaluate a USQ Determination, including walking down the proposed change/potential inadequacy.
- b. Review and evaluate an Authorization Agreement.
- c. Review and evaluate a Safety Evaluation Report (SER).
- d. Walk down a facility with Safety System Oversight person, safety analyst or SME identifying the safety controls contained in a TSR.
- e. Complete a review of a hazard analysis or accident analysis including walking down the scope of work area or accident scenario.

### **7. An STSM shall have a working level knowledge of the application of environmental standards, laws, and regulations.**

#### Supporting Knowledge and/or Skills:

- a. Demonstrate awareness of sources of environmental rules, such as Federal and state statutes, regulations, and DOE orders.
- b. Describe the organization, and mission, and enforcement authorities of the U.S. Environmental Protection Agency (EPA).
- c. Discuss the *National Environmental Policy Act* process and the role of the Department and its contractors in implementation.
- d. Describe the role(s) of a DOE contractor with respect to compliance with environmental laws and regulations, and discuss the responsibilities of the Federal staff employees for management and oversight of the DOE contractor for such compliance.
- e. Demonstrate awareness that environmental requirements are enforceable criminally and civilly.

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- f. Discuss ISO 14001, *Environmental Management Systems Standards*, and their relevance to DOE and contractor performance.
- g. Discuss DOE O 450.1 and the requirements for DOE sites to implement Environmental Management Systems as part of the Integrated Safety Management System (ISMS), including goals for pollution prevention and sustainable environmental stewardship.
- h. Describe the role(s) the contractor plays in compliance with environmental regulations.
- i. Participate on an environmental assessment team, preparing and reporting the team's results to senior federal and contractor management.

**8. An STSM shall have a working level knowledge of the application of worker protection standards and the Employee Concern's Program.**

Supporting Knowledge and/or Skills:

- a. Demonstrate awareness of sources of occupational safety and health rules, such as Federal and state statutes, regulations, and orders (e.g., DOE O 440.1A, Worker Protection Management for DOE Federal and Contractor Employees, and 10 CFR 851, Worker Safety and Health Program).
- b. Describe how the ISM core functions and principles and the quality assurance (QA) criteria are integrated into the activity-level work planning and control processes for protection of the workers at a given facility or site.
- c. Describe the organization, and mission and enforcement authorities of the Occupational Safety and Health Administration (OSHA) and interface with the Atomic Energy Act through MOU's and 10 CFR851.
- d. Demonstrate awareness that occupational safety and health requirements are enforceable criminally and civilly.
- e. Describe the role(s) the contractor plays in implementing occupational safety and health regulations.
- f. Describe the purpose, scope, and importance of the Department's Employee Concerns Program.
- g. Describe the responsibilities of the following in implementing DOE O 442.1A, *Department of Energy Employee Concerns Program*:
  - Headquarters and Field Office Managers; and
  - Employee Concerns Manager.
- h. Describe how employee concerns are reported, processed, and documented as stated in DOE O 442.1A and the DOE G 442.1-1, *Department of Energy Employee Concerns Program Guide*.

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- i. Describe the criteria for designating and processing occupational health and safety concerns.
- j. Participate in an assessment of worker protection standards at a given facility or site and report the results to senior federal and contractor management.

**9. An STSM shall have a working level knowledge of the Department's Emergency Management resources including emergency plans, external agency involvements, interagency relationships, and the command and control function during an emergency.**

Supporting Knowledge and/or Skills:

- a. Discuss the Department's three-tiered organizational approach to managing Operational Emergencies.
- b. Discuss the roles and responsibilities of the Departmental elements for management of the Department's Emergency Management System as defined in DOE O 151.1C, *Comprehensive Emergency Management System*.
- c. Define "Operational Emergencies" and the circumstances to which they apply as defined in DOE O 151.1C, *Comprehensive Emergency Management System*.
- d. Discuss the concept of Emergency Public Information and the different roles of the Department's Public Relations Office and the Joint Information Center in disseminating information in an emergency.
- e. Discuss the involvement of external agencies in the Department's Emergency Management System.
- f. Describe the contents, the requirements for, and where each of the following types of emergency plans can be located on-site:
  - Site Emergency Plan;
  - Facility Emergency Plan;
  - Building Emergency Plan;
  - Security Emergency Plan;
  - Fire Prevention/ Suppression Plan;
  - Worker Safety Plan(s); and
  - Continuity of Operations Plan.

Mandatory Performance Activities:

- a. Complete Emergency Manager Training or Emergency Operations Center (EOC) training.
- b. Participate in the EOC during a site emergency management drill.

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- c. Complete and pass the Federal Emergency Management Administration (FEMA) Emergency Management Institute IS-00700 “National Incident Management System (NIMS) and Introduction” course.

### 10. An STSM shall have working level knowledge of conduct of operations.

#### Supporting Knowledge and/or Skills:

- a. Describe the reason for implementing conduct of operations at DOE facilities.
- b. Discuss the requirements for implementing conduct of operations at DOE facilities and the associated impact on safety and efficiency of operations.
- c. Discuss the purpose and describe the roles and responsibilities of the STSM in implementing DOE O 5480.19, *Conduct of Operations Requirements for DOE Facilities*.
- d. Discuss the concept of “graded approach” and how it applies to the implementation of conduct of operations.
- e. For each of the 18 chapters in Attachment I to DOE O 5480.19, describe how each activity contributes to an effective and safe operational environment.
- f. Describe the types of operations where formal conducts of operations apply.
- g. Discuss how the self-assessment process is applied to ensure safe operations.
- h. Working with a qualified DOE Facility Representative in a given facility, review/assess the conduct of operations or work in progress in the facility. Develop a report of your findings and discuss it with the contractor facility management.

### 11. An STSM shall have a working level knowledge of waste management principles and practices.

#### Supporting Knowledge and/or Skills:

- a. Discuss awareness of definitions of the following types of waste that may be provided in Federal laws and regulations:
  - Low level waste;
  - High level waste;
  - Transuranic waste; and
  - Mixed waste.
- b. Discuss the Department’s policies and practices regarding the handling and management of waste as described in DOE O 435.1, *Radioactive Waste Management*.



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- c. Discuss the Department's performance objectives and performance assessment requirements as outlined in DOE O 435.1.
- d. Discuss the Department's policies on waste management including:
  - Generation reduction;
  - Segregation;
  - Minimization;
  - Pollution prevention; and
  - Disposal.
- e. Discuss how the following Acts apply to and impact the Department's waste management programs:
  - *Federal Facility Compliance Act (FFCA)*;
  - *Pollution Prevention Act of 1990*; and
  - *Superfund Amendment Reauthorization Act*.
- f. Demonstrate an understanding of the general requirements of Section 3116 of the 2005 *National Defense Authorization Act* regarding appropriate classification of waste.
- g. Demonstrate an understanding of the general requirements of the *Resource Conservation and Recovery Act* of 1976 as it applies to hazardous and mixed waste.
- h. Discuss the process for determining whether or not waste is hazardous.
- i. Describe the general requirements and issues associated with the transportation and packaging of radioactive wastes.
- j. Conduct an assessment of waste management practices at a given site/facility and prepare a report on how these practices can be improved.

**12. An STSM shall have a working level knowledge of maintenance management as it relates to safety.**

Supporting Knowledge and/or Skills:

- a. Describe DOE O 433.1, *Maintenance Management Program for DOE*, to explain:
  - DOE's role in the oversight of contractor maintenance operations;
  - The intent of maintenance management programs;
  - The Department's policy and objectives for maintenance management; and
  - The responsibilities and authorities for maintenance management programs.

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- b. Discuss the requirements for the control and integration of contractor and subcontractor personnel in maintenance activities.
- c. Discuss the graded approach process by which Department line management determines an appropriate level of coverage by facility maintenance management personnel.
- d. Discuss how maintenance activities interface with the following as it relates to safety:
  - Conduct of operations;
  - Quality assurance;
  - Configuration management;
  - Safety SSCs;
  - Authorization Basis;
  - Design Basis; and
  - Suspect/counterfeit items.
- e. Review and evaluate the adequacy of a work package
- f. Observe in the field and evaluate the conduct of maintenance work utilizing a work package from start to finish.

**13. An STSM shall have a working level knowledge of formal configuration management as it relates to safety.**

Supporting Knowledge and/or Skills:

- a. Discuss the roles and responsibilities of the STSM related to implementing and maintaining configuration management programs.
- b. Discuss the concept of configuration management and its importance in ensuring operational safety.
- c. For the elements identified above, describe the possible effects on safe operations if they are ineffectively implemented.
- d. Describe a typical configuration management process.
- e. Given the current version of DOE-STD-1073 or its successor, discuss the system engineer concept as it applies to oversight of safety systems. Specifically address the areas of configuration management, assessment of system status and performance, and technical support for operations, maintenance activities and for Documented Safety Analysis reviews.

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- f. Discuss each of the following elements of configuration management and how they contribute to safety and an effective configuration management program.
  - Program management;
  - Document control;
  - Change control;
  - Graded approach;
  - Design requirements; and
  - Assessments.
- g. Discuss approved/recommended compensatory actions where inadequate configuration management exists and work is ongoing or to be initiated.
- h. Using system drawings walk down and assess the configuration management, operability, and reliability of a safety-class or safety-significant system in a facility with system engineer/safety system oversight (SSO) personnel.

**14. An STSM shall have a working level knowledge of safeguards and security as it relates to safety practices.**

Supporting Knowledge and/or Skills:

- a. Define the terms “safeguards” and “security” as they apply to the DOE Safeguards and Security Program.
- b. Discuss a Site Safeguards and Security Plan (SSSP), to include:
  - Content and purpose;
  - Review/approval cycle;
  - Design Basis Threat (DBT);
  - Process (e.g., vulnerability assessments); and
  - System effectiveness ( $P_E$ ) reporting.
- c. Discuss in detail the purpose, interrelationship, responsibilities, and basic requirements for the following:
  - Physical security;
  - Personnel security; and
  - Material Control and Accountability.
- d. Describe the use of information security systems within DOE.
- e. Discuss the interrelationship between safeguards and security to safety practices and facility operations.
- f. Discuss the security requirements associated with the Department’s foreign visitor and assignments program.

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- g. Participate in an audit of safeguards and security practices at a given facility or site.

**15. An STSM shall have a working level knowledge of DOE directives structure and their relationship to applicable laws, rules, Federal/state regulations and industry standards.**

Supporting Knowledge and/or Skills:

- a. Demonstrate an understanding of the purpose and the relationship between DOE Orders, directives, Federal regulations, and State regulations.
- b. Discuss the DOE directives process.
- c. Demonstrate an understanding of the DOE rule-making process.
- d. Demonstrate an understanding of the relationship between the DOE and OSHA and EPA.
- e. Demonstrate an understanding of the purpose of the FFCA.
- f. Discuss the use of Memoranda of Understanding (MOU) and Memoranda of Agreement (MOA) with external agencies and organizations.
- g. Discuss the purpose and scope of Standards/Requirements Identification Documents (S/RIDs), Work Smart Standards, and directives flowdown and their relationship to Contract List A and List B.
- h. Demonstrate an understanding of Public Law 104-113 regarding the use of industry consensus standards.
- i. Demonstrate an understanding of the purpose of the *Federal Advisory Committee Act* (FACA).

**16. An STSM shall have a working level knowledge of the Price-Anderson Amendments Act of 1988 (PAAA) and its impact on DOE nuclear safety activities.**

Supporting Knowledge and/or Skills:

- a. Demonstrate an understanding of the PAAA.
- b. Demonstrate an understanding of the Act's applicability to the Department's nuclear safety activities, and specifically to each of the site's facilities and major activities.
- c. Demonstrate an understanding that violations of applicable nuclear safety rules and regulations are enforceable criminally and civilly.

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- d. Demonstrate an understanding of the topics below, associated with the PAAA:
  - Procedural Rules for DOE Nuclear Activities (10 CFR 820);
  - Documented Safety Analyses (10 CFR 830 Subpart B);
  - Un-reviewed Safety Questions (10 CFR 830 Subpart B);
  - Quality Assurance Requirements (10 CFR 830 Subpart A);
  - Technical Safety Requirements (10 CFR 830 Subpart B); and
  - Occupational Radiation Protection (10 CFR 835).
- e. Discuss the role of Federal line management with respect to implementing the requirements of the PAAA.
- f. Discuss the role of the site's PAAA Coordinator.
- g. Review the recent PAAA notices and decisions with the site's PAAA Coordinator to determine close-out status and verification of corrective actions.

**17. An STSM shall have a working level knowledge of the Defense Nuclear Facilities Safety Board's (DNFSB) purpose and their interaction with the DOE.**

Supporting Knowledge and/or Skills:

- a. Discuss the enabling legislation and the purpose of the DNFSB.
- b. Identify and discuss applicable DNFSB Recommendations.
- c. Identify and discuss Department Implementation Plans and commitments made in response to DNFSB Recommendations.
- d. Discuss the roles and responsibilities of the Departmental Representative to the DNFSB as described in DOE M 140.1-1B, *Interface with the Defense Nuclear Facilities Safety Board*.
- e. Prepare and/or participate in a briefing to the DNFSB on the status of a Departmental activity or initiative.

**18. An STSM shall have a working level knowledge of problem identification, solving, and decision making techniques.**

Supporting Knowledge and/or Skills:

- a. Describe and explain the application of problem analysis techniques in:
  - Root cause analysis;
  - Causal factor analysis;
  - Change analysis; and
  - Barrier analysis.

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- b. 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; and
  - Recommendation generation.
- c. Describe the elements of an effective issue management system and its importance to safety.
- d. Describe the following types of accident investigations and discuss an example of the application of each:
  - Type A; and
  - Type B.
- e. Discuss the necessary considerations that must be addressed when developing a corrective action.
- f. Discuss the immediate, short-term, and long-term actions taken as the result of problem identification or an occurrence.
- g. Describe the assessment requirements and limitations associated with the interface with contractor employees.
- h. Explain the essential of the below activities including:
  - Investigation;
  - Fact finding;
  - Reporting;
  - Tracking to closure;
  - Follow-up; and
  - Corrective Action Implementation.
- i. Describe the actions to be taken if the contractor challenges the assessment findings and explain how such challenges can be avoided.
- j. Discuss the key processes used in the trending and analysis of operations.
- k. Discuss the key process to develop and implement metrics and performance measures, validate performance against metrics and performance measures, and trend/analyze data to establish a continuous improvement program.
- l. Discuss the importance and key elements of the following:
  - Maintenance history;
  - Operational incident/occurrence report data;
  - Security infractions;
  - Safety incidents;

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- Radiation exposure and incident reporting;
  - Schedule variances; and
  - Counterfeit and suspect parts.
- m. Using DOE O 231.1A, *Environment, Safety, and Health Reporting*, and DOE M 231.1-2, *Occurrence Reporting and Processing of Operations Information*, discuss the role of an STSM related to reportable occurrences. Given an occurrence report, determine whether:
- Review processes are adequate;
  - Causes are appropriately defined;
  - Corrective actions address causes;
  - Lessons learned are appropriate; and
  - Corrective actions are completed.
- o. Discuss the process for preparing a minority report and explain the importance of encouraging and evaluating differing professional/technical opinions.
- p. Lead a team to conduct compliance-based and performance-based assessments. Identify the differences in outcomes and the reasons for these differences.
- q. Write, or review and approve, an assessment report.
- r. Based on an evaluation of contractor activities, review and approve corrective actions and recommendations, and communicate the results to contractor management.
- s. Participate in formal meetings between Department management and assessed organizations management to discuss the results of the assessments.
- t. Given incident/occurrence report data for a specified period, analyze the information for contributing factors and safety trends.
- u. Given the data for an event, determine the root cause and develop corrective actions. Compare the results with that of the originator. Discuss any differences.
- 19. An STSM shall have a working level knowledge of contract management to assess contractor technical performance.**

### Supporting Knowledge and/or Skills:

- a. Identify the three major DOE contract types and describe the characteristics, and the advantages and disadvantages of each.
- b. Identify and discuss the types of contracting processes that are used to put major contracts in place.
- c. Discuss how the Statement of Work is developed and contract deliverables are identified, including:

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- Technical Specification(s);
  - Quality Assurance requirements; and
  - Technical review and acceptance of deliverables.
- c. Discuss the following terms as they apply to financial accountability:
- Incentives;
  - Fines and penalties;
  - Third-party liabilities;
  - Loss of, or damage to, Government property; and
  - Allowable and non-allowable costs.
- d. Discuss the technical oversight and qualifications required to assess contractor performance and the training of contractor employees.
- e. Discuss the fee-based evaluation process including the development of performance criteria, conduct of the evaluation, and documentation and transmittal requirements for performance.
- f. Identify who can make contractual requests or approvals of contract provisions, and the qualifications required of that individual(s).
- g. Discuss the intent of the revised DEAR Clause, 970.5223-1, regarding environment, safety, and health (ES&H) and the impact of contract reform on ES&H.
- h. Participate on a team reviewing the contractor's subcontracting practices.
- 20. An STSM shall demonstrate the ability to effectively manage programs and projects utilizing the processes and procedures necessary to ensure the safety of departmental activities, including some knowledge of the mission and key programs.**

### Supporting Knowledge and/or Skills:

- a. Discuss the Department's policy for planning, programming, budgeting, and acquisition of capital assets as described in DOE P 413.1, *Program and Project Management Policy for the Planning, Programming, Budgeting, and Acquisition of Capital Assets*.
- b. Define the following terms:
- Baseline;
  - Graded approach;
  - Infrastructure;
  - Life-cycle;
  - Programmatic management; and
  - Metrics and performance measures.



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- c. Describe the key elements of supervising/monitoring program activities and contractors.
- d. Describe the purpose of schedules, and discuss the use of milestones and activities.
- e. Define and compare the terms cost estimate and budget.
- f. Describe the process for preparing cost estimates and budgets.
- g. Define and explain the relationship between following terms:
  - Budgeted Cost of Work Scheduled (BCWS);
  - Budgeted Cost of Work Performed (BCWP); and
  - Actual Cost of Work Performed (ACWP).
- h. Discuss how priorities should be balanced to achieve the following:
  - Resources are effectively allocated to address safety, programmatic, and operational considerations; and
  - Protecting the public, the workers, and the environment is a priority whenever activities are planned and performed.
- i. Discuss DOE's budgeting process to capture funding decisions based on prioritization of work.
- j. Discuss the requirements to procure external products and services for DOE projects.
- k. Describe the methods for procuring DOE or other government products and services.
- l. Explain what is meant by "Make-or-Buy" in procuring products or services.
- m. Discuss the Davis-Bacon Act as it relates to DOE financial management issues.
- n. Discuss the responsibilities, authorities, and implementation requirements for DOE O 430.1B, *Real Property Asset Management*, at defense nuclear facilities.
- o. Compare and contrast the project manager and program manager qualification requirements at a given office or site.
- p. Manage or oversee the performance of a given project or program that has a minimum duration of six months.

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21. **An STSM shall have a working level knowledge of quality assurance policies, programs, and processes.**

Supporting Knowledge and/or Skills:

- a. Describe the general requirements, purpose, interrelationships, and importance of DOE O 414.1C; 10 CFR 830, Nuclear Safety Management; 10 CFR 830.120, *Quality Assurance*; and national or international consensus standards on quality assurance.
- b. Describe how ASME NQA-1-2004 is applied to implement the QA criteria.
- c. Describe how the QA requirements are related to the Documented Safety Analysis.
- d. Describe the DOE and contractor responsibilities and requirements for implementing a Quality Assurance Program (QAP).
- e. Discuss the role of STSMs with respect to DOE O 414.1C, 10 CFR 830, Nuclear Safety Management and 10 CFR 830 Subpart A, *Quality Assurance*.
- f. Describe the 10 quality assurance criteria of DOE O 414.1C and 10 CFR 830 Subpart A which address the following:
  - Management;
  - Performance; and
  - Assessment.
- g. Referring to the following DOE Guides supporting DOE O 414.1C and 10 CFR 830 Subpart A, discuss the implementation of an effective QAP.
  - DOE G 414.1-1A, Management and Independent Assessment Guide;
  - DOE G 414.1-2A, *Quality Assurance Management System Guide for Use with 10 CFR 830 Subpart A, Quality Assurance Requirements*, and DOE O 414.1C, *Quality Assurance*;
  - DOE G 414.1-3, *Suspect/Counterfeit Items Guide for Use with 10 CFR 830 Subpart A, Quality Assurance Requirements*, and DOE O 414.1B, *Quality Assurance*; and
  - DOE G 414.1-4, *Safety Software Guide for Use with 10 CFR 830, Subpart A, Quality Assurance Requirements*, and DOE O 414.1C, *Quality Assurance*.
- h. Describe the scope, purpose, and application of the safety software quality assurance requirements and work practices.

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- i. Discuss how the approved Quality Assurance Program at a given DOE site office or contractor is applied to safety system design, construction and operations, and implementation of its Integrated Safety Management System. Address in the report how the 10 QA criteria and the 12 safety management principles/functions are integrated and the approach used, and effectiveness of the flow-down of QA criteria to subcontractors.

**22. An STSM shall have a working level knowledge of radiation protection program requirements described in 10 CFR 835; and a familiarity level of knowledge of the related DOE Orders, Standards, and Guides.**

Supporting Knowledge and/or Skills:

- a. Discuss the purpose and objectives of a DOE Radiation Protection Program.
- b. Identify and explain the general and unique radiological hazards associated with the following (as applicable to the STSM):
  - Plutonium operations;
  - Uranium operations;
  - Tritium operations;
  - Nuclear explosive operations;
  - Production/experimental reactors;
  - Accelerator operations;
  - Waste handling/processing operations;
  - Decontamination and decommissioning;
  - Use of radiation generating devices; and
  - Environmental restoration activities.
- c. Discuss how the radiation protection program is related to the nuclear safety basis (and Documented Safety Analysis) for the STSM's cognizant facility(s) and activities.
- d. Identify and discuss the required elements of a radiation protection program including the requirements for internal audits.
- e. Discuss the role of the following radiation protection policy, guides and standard in establishing and maintaining a radiation protection program for a given DOE nuclear facility/activity:
  - DOE P 441.1, DOE Radiological Health and Safety Policy;
  - DOE G 441.1-series; and
  - DOE-STD-1098-99, Radiological Control.
- f. Discuss the requirements delineated in DOE Order 5400.5, *Radiation Protection of the Public and the Environment*.

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### Mandatory Performance Activities (perform either a or b below):

- a. Conduct an assessment of the radiation protection program at a given site/facility and report the results to DOE management.
- b. Review a radiation protection program assessment for a DOE nuclear facility/activity; evaluate proposed corrective actions and discuss the results of the review with the DOE radiation protection program subject matter expert.

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## APPENDIX A CONTINUING EDUCATION, TRAINING AND PROFICIENCY PROGRAM

The following list represents suggested continuing education, training, and other opportunities that are available for STSMs after completion of the competency requirements in this technical Functional Area Qualification Standard. It is extremely important that STSMs with this program maintain their proficiency primarily by regularly demonstrating their STSM competencies through on-the-job performance, supplemented with 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 the following activities support the maintenance of proficiency in the STSM 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

1. Technical training
  - a. Nuclear Executive Leadership Training
2. Management training
  - a. Federal Executive Institute
  - b. Executive Leadership Forum
  - c. Management Development Seminar(s)
  - d. Media Skills for Executives
  - e. Integrated Safety Management (ISM) seminars or training activities
  - f. EEO and diversity training
  - g. Federal appropriations law/updates
  - h. Employee performance and conduct
  - i. Program/project management seminars or training activities

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## CONCLUDING MATERIAL

### Review Activity:

EM  
NNSA  
EH  
NE  
SC

### Preparing Activity:

EH-2

### Project Number:

TRNG-0047

### Field and Operations Offices

CBFO  
CH  
ID  
OH  
OR  
ORP  
RFFO  
RL  
SR

### Area and Site Offices

Argonne Area Office  
Brookhaven Area Office  
Fermi Area Office  
Kansas City Site Office  
Livermore Site Office  
Los Alamos Site Office  
Nevada Site Office  
Pantex Site Office  
Princeton Area Office  
Savannah River Site Office  
Sandia Site Office  
Y-12 Site Office