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DOE STANDARD

WEAPON QUALITY ASSURANCE QUALIFICATION STANDARD

NNSA Weapon Quality Assurance 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 (DOE) managers responsible for overseeing the Federal Technical Capability Program. This Panel is responsible for reviewing and approving the qualification standard for Department-wide application. Approval of this qualification standard by the Federal Technical Capability Panel is indicated by signature below.



Karen L. Boardman, Chairperson
Federal Technical Capability Panel

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ACKNOWLEDGMENT

The Y-12 Site Office is the sponsor for the Weapon Quality Assurance (WQA) Qualification Standard. The sponsor is responsible for coordinating the development and/or review of the Functional Area Qualification Standard (FAQS) by subject matter experts to ensure that the technical content of the standard is accurate and adequate for National Nuclear Security Administration (NNSA)-wide application for those involved in the Weapon Quality Assurance program. The sponsor, in coordination with the Federal Technical Capability Panel, is also responsible for ensuring that the FAQS 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**

Weapon Quality Assurance (WQA)

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 FAQs.

The technical qualification standards are not intended to replace the OPM qualifications standards or 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 NNSA personnel responsible for the production, design, and maintenance of nuclear weapons which support the safe operation of defense nuclear and non-nuclear facilities.

APPLICABILITY

The Weapon Quality Assurance FAQs establishes common functional area competency requirements for all National Nuclear Security Administration (NNSA) Weapon Quality Assurance personnel who provide assistance, direction, guidance, oversight, or evaluation of contractor activities that could impact the production, maintenance, and design of nuclear weapons. The technical FAQs has been developed as a tool to assist NNSA program and field offices in the development and implementation of the TQP in their organization. For ease of transportability of qualifications between NNSA elements, program and field offices are expected to use this technical FAQs without modification or addition. 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 (see the Federal Technical Capability Program [FTCP] Directives and Standards page at <http://www.hss.energy.gov/deprep/ftcp/directives/directives.asp> for an example of the Weapon Quality Assurance FAQs qualification card) ensures that personnel possess the minimum requisite competence to fulfill their functional area duties and responsibilities common to the DOE complex. Additionally, office-/site-/facility-specific qualification standards 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

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knowledge, regulations, administrative capability, and assessment and oversight are all embodied in the competencies listed in this standard. All these factors have a bearing on weapon quality. Although the focus of this standard is technical competence, competencies 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 critical aspects of Weapon Quality.

IMPLEMENTATION

This technical FAQs identifies the minimum technical competency requirements for DOE Weapon Quality Assurance personnel. These positions are the Weapon Quality Assurance Specialist, and the Weapon Quality Assurance Engineer/Scientist. Although there are other competency requirements associated with the positions held by NNSA personnel, this FAQs is limited to identifying the specific, common technical competencies required. The competency requirements define the expected knowledge and/or skill that an individual must meet. Each of the competency requirements is further described by a listing of supporting knowledge and/or skill statements. The supporting knowledge and/or skill statements for each competency requirement are provided to challenge the employee in the breadth and depth of his/her understanding of the subject matter. For each position, expected knowledge and/or skills have been designated as “mandatory performance activities” which are not optional.

The terms “shall,” “must,” and “will” denote mandatory requirements in this standard. “Should” denotes a recommended practice that is not required. “May” denotes an option.

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, quality, safety) or consult appropriate reference materials required to ensure the quality of DOE 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 DOE practices.

Headquarters and field elements shall establish a program and process to ensure that DOE personnel possess the competencies required by their position, including the competencies identified in this technical FAQs. Documentation of the completion of the requirements of the standard shall be included in the employees’ training and qualification records. Satisfactory attainment of the competency requirements contained in this technical FAQs may be documented using the example Weapon Quality Assurance FAQs qualification card that can be obtained from the Federal Technical Capability Program Directives and Standards page at <http://www.hss.energy.gov/deprep/ftcp/directives/directives.asp>.

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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 an equivalency for a competency.

Training shall be provided to employees in the TQP who do not meet the competencies contained in this 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 requirements. 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 requirements.

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 and the requirements in DOE M 360.1-1B, *Federal Employee Training Manual*, and DOE M 426.1-1A.

The immediate supervisor should ensure that the candidate meets the background and experience requirements of this FAQs. Unless stated otherwise within the program or site TQP Plan, attainment of the competencies listed in the Weapon Quality Assurance FAQs should be evaluated and documented by a qualifying official or immediate supervisor (note: if the immediate supervisor is not a Weapon Quality Assurance Engineer/Scientist or Specialist, it is expected the supervisor will consult with a qualified Weapon Quality Assurance Engineer/Scientist or Specialist) using one or a combination of the following methods.

- Satisfactory completion of a written examination
- Satisfactory completion of an oral examination
- Satisfactory accomplishment of an observed task, walkthrough, survey/assessment, or activity directly related to a competency
- Documented evaluation of equivalencies (such as applicable experience in the field) without a written examination.

Field element managers/Headquarters program managers shall qualify candidates as possessing the basic technical knowledge, technical discipline competency, and position-specific knowledge, skills, and abilities required for their positions. Final qualification should be performed using one or a combination of the following methods:

- Satisfactory completion of a comprehensive written examination. The minimum passing grade should be 80 percent.

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- Satisfactory completion of an oral examination by a qualified Senior Technical Safety Manager (STSM) or a qualification board of technically qualified personnel to include at least one qualified STSM.
- Satisfactory completion of a walkthrough with a qualifying official for the purpose of verifying a candidate's knowledge and practical skills of selected key elements.

Guidance for oral interviews and written exams is contained in DOE-HDBK-1205-97, *Guide to Good Practices for the Design, Development, and Implementation of Examinations*, and DOE-HDBK-1080-97, *Guide to Good Practices for Oral Examinations*.

For oral examinations and performance demonstrations, qualifying officials or board members should ask critical questions intended to integrate identified learning objectives during qualification.

Field element managers/Headquarters program managers or designees should develop formal guidance for oral examinations, survey/assessments, and walkthroughs that includes:

- Standards for qualification
- Use of technical advisors by a board
- Questioning procedures or protocol
- Pass/fail criteria
- Board deliberations and voting authorization procedures
- Documentation process

INITIAL QUALIFICATION, REQUALIFICATION, AND TRAINING

Qualification of Weapon Quality Assurance personnel shall be conducted in accordance with the requirements of DOE M 426.1-1A and this FAQs.

Weapon Quality Assurance personnel shall requalify to the requirements of this technical standard every five years. The NNSA Departmental sponsor/Lead NNSA FTCP Agent shall establish the specific requalification training designed to update and maintain the qualifications of Weapon Quality Assurance personnel. NNSA 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 Weapon Quality Assurance FAQs since the individual's last qualification or requalification.
2. Written examinations, oral examination, or performance demonstrations are used, as necessary, to demonstrate competency on the new material and those area(s) from the initial qualification where the individual has not demonstrated ongoing experience in the past 5 years.

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NNSA 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:

- NNSA
- 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 the Weapon Quality Assurance FAQs 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 Weapon Quality Assurance Functional Area:

Note: These responsibilities may vary at different NNSA sites and are not all inclusive. Site-specific Position Descriptions (PDs) will provide additional details. This list is not intended to circumvent the PDs, only provide guidelines.

A. **Weapon Quality Assurance Specialist**

- a. Monitors, inspects, analyzes and investigates complex electrical, electronic, mechanical, electro-mechanical, and nuclear components, subassemblies, and assemblies associated with the manufacture of nuclear weapons and other non-nuclear components as applicable.
- b. Conducts Quality Assurance Surveys (QAS) and oversight activities of contractor operations.
- c. Performs verification acceptance of product manufactured by the DOE Weapons Complex.
- d. Investigates quality and manufacturing problems and ensures corrective actions are appropriate for the identification and control of product and process deficiencies.
- e. Conducts other activities as defined in the Quality Assurance Procedures Manual (QAPM).

B. **Weapon Quality Assurance Engineer/Physical Scientist**

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- a. Monitors nuclear weapons and non-nuclear components assembly and surveillance activities of the Management and Operating (M&O) contractor to assure that the production processes and quality control operations for nuclear weapon assemblies, subassemblies, and components (nuclear and non-nuclear) are adequate and result in acceptable product quality.
- b. Provides production support and weapons program (nuclear and non-nuclear) direction to M&O contractor contracting officer representatives when appropriate.
- c. Ensures surveys and technical studies conducted by weapon quality staff adequately cover the contractor production processes and quality control operations for assigned weapons activities.
- d. Ensures assigned weapons activities comply with weapon quality policies, procedures, specifications, and other requirements and that these policies, procedures, specifications, and other requirements are adequate.
- e. Schedules and conducts QAS surveys on assigned weapons activities (nuclear and non-nuclear) that require engineering judgment and expertise to interpret policies, procedures, specifications, and other requirements assuring that the life cycle processes and quality control operations for nuclear weapon assemblies, subassemblies, and components (nuclear and non-nuclear) are adequate and result in acceptable product quality. Reviews QAS criteria checklists, survey guidelines, and non-nuclear verification instructions for assigned weapons activities.
- f. Initiates, responds, and provides technical and status information on assigned weapons activities (nuclear and non-nuclear) by interfacing with NNSA Headquarters, Service Center/site offices, on-site NNSA personnel, design/production agency, and site contractor technical personnel. Provides policy guidance or interpretation in situations where guidelines exist and do not exist to contractor personnel.
- g. May perform the responsibilities of a Weapon Quality Assurance Specialist as applicable.

Position-specific duties and responsibilities for Weapon Quality Assurance personnel are contained in a site's respective office/site/facility specific qualification standard and/or PD.

BACKGROUND AND EXPERIENCE

The OPM *Qualification Standards 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.

The preferred education and experience for **Weapon Quality Assurance Specialists** are:

1. Education:

The education requirements are a High School Diploma or equivalent with emphasis on technical or vocational curriculum. Emphasis preferred on quality assurance, statistics,

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mathematics, production management, industrial management, computer science, engineering, engineering technology, physical sciences, textiles, or other fields related to the position. Other disciplines and employer training may also be appropriate based on the duties to be performed and considering the experience gained in performing related quality assurance activities.

Note: The 1910 Series Quality Assurance Specialist position may have equivalencies appropriate to the function to be performed.

2. Experience:

Two to three years of related work experience where quality assurance, quality control, quality inspection, quality systems, product realization, or other quality functions were used/employed. Military, inspection, Federal, State, or other directly related background that has provided specialized experience relative to weapon quality assurance may also be considered. Specialized experience can be demonstrated through possession of the competencies outlined in this standard.

Note: In addition to the above stated education and experience, a national Lead Auditor Certification (e.g., NQA-1, ISO 9001 and ASQ), Certified Quality Engineer (CQE), or Certified Quality Manager (CQM) may serve as the basis for equivalency of competencies in portions of this standard.

The preferred education and experience for **Weapon Quality Assurance Engineers/Scientists** are:

1. Education:

Bachelor's degree in engineering or physical science that include studies of quality assurance, statistics, mathematics, production management, industrial management, computer science, engineering, engineering technology, physical sciences, or other fields related to the position. Or, meet the alternative requirements specified for engineers or scientists and as required by the OPM to satisfy educational requirements. Bachelor's degree in other disciplines may also be appropriate based on the duties to be performed and considering the experience gained in performing related quality assurance activities.

Note: The 1910 Series Quality Assurance Specialist position may have equivalencies appropriate to the function to be performed.

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2. Experience:

Experience in fields such as quality control, quality inspection, product realization, supply and storage, industrial or production planning, research and engineering, and test evaluation that provided (1) familiarity with quality assurance or related work, (2) pertinent product or process knowledge and skill, (3) ability to interpret and apply contract requirements and engineering specifications, (4) experience in fields such as inspector, auditors, or formal assessors. Industrial, military, Federal, State, or other directly-related background that has provided specialized experience relative to weapon quality assurance may be considered. Specialized experience can be demonstrated through completion of the competencies outlined in this standard.

Note: In addition to the above stated education and experience, a national Lead Auditor Certification (e.g., NQA-1, ISO 9001), CQA, CQE, or CQM may serve as the basis for equivalency of competencies in portions of this standard.

REQUIRED TECHNICAL COMPETENCIES

The competencies contained in this standard are distinct from those competencies contained in the General Technical Base (GTB) Qualification Standard. All Weapon Quality Assurance personnel must satisfy the competency requirements of the GTB 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 requirements is further described by a listing of supporting knowledge and/or skill statements that describe the intent of the competency statement(s). For each position, expected knowledge and/or skills have been designated as “mandatory performance activities” which are not optional.

Note: When regulations, DOE directives, or other industry standards are referenced in the FAQs, the most recent revision should be used. It is recognized that some Weapon Quality Assurance personnel may oversee facilities that utilize predecessor documents to those identified. In those cases, such documents should be included in local qualification standards via the TQP.

Weapon Quality Assurance Specialist

General Technical

1. **Weapon Quality Assurance Specialists shall demonstrate a working level knowledge of geometric dimensions and tolerances.**

Supporting Knowledge and/or Skills

- a. Explain the purpose and use of dimensions and tolerances.
- b. Demonstrate knowledge and use of the dimensions and tolerances on product drawings and specifications.

2. **Weapon Quality Assurance Specialists shall demonstrate a working level knowledge of testing and inspection methods and processes used in weapons certification activities.**

Supporting Knowledge and/or Skills

- a. Discuss the types and applications of nondestructive/destructive testing.
- b. Discuss a typical lot sample selection method for destructive testing.
- c. Describe the use of test data and reporting.

3. **Weapon Quality Assurance Specialists shall demonstrate a working level knowledge of a nonconformance and the Suspect/Counterfeit Item Program identified in DOE O 414.1C, *Quality Assurance*, and DOE/NNSA *Weapon Quality***

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Policy (QC-1).

Supporting Knowledge and/or Skills

- a. Discuss the purpose of a nonconformance and the Suspect/Counterfeit Item Program.
- b. Describe the process and/or procedures used to implement nonconformance requirements.
- c. Describe the requirements and method for reporting nonconforming material delivered between NNSA agencies.
- d. Describe the purpose for the disposition of nonconforming and suspect material/items.

4. Weapon Quality Assurance Specialists shall demonstrate a working level knowledge of Software Quality Assurance (SQA).

Supporting Knowledge and/or Skills

- a. Discuss the requirements for SQA specific to DOE/NNSA, *Weapon Quality Policy (QC-1)*.
- b. Identify the procedure/process used by the M&O contractor for SQA development, testing, use control, and error reporting and correction.

5. Weapon Quality Assurance Specialists shall demonstrate a working level knowledge of metrology and calibration used in the weapons program from the following documents:

- **DOE/NNSA 56XB, *Nuclear Weapon Development and Production Manual***
- **Primary Standards Laboratory Memorandum**
- **DOE/NNSA *Weapon Quality Policy (QC-1)***

Supporting Knowledge and/or Skills

- a. Describe the purpose of instrument and equipment calibration.
- b. Describe the function the Primary Standards Laboratory performs on behalf of NNSA.
- c. Discuss the measurements and control of calibrated instruments used in weapon production.

6. Weapon Quality Assurance Specialists shall demonstrate a working level knowledge of process control and statistical sampling methods for product inspection.

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Supporting Knowledge and/or Skills

- a. Discuss examples of process control used in weapon production processes.
 - b. Discuss the statistical sample methods applicable to product acceptance used by the Quality Assurance Procedures Manual.
7. **Weapon Quality Assurance Specialists shall demonstrate a working level knowledge of NNSA product acceptance.**

Supporting Knowledge and/or Skills

- a. Describe the use of the Quality Instruction List (QIL).
 - b. Describe the use of the Certification of Inspection (COI).
 - c. Describe the verification inspection process including Quality Assurance Inspection Procedures (QAIPs), where the requirements come from, reviewing certification documentation, reviewing drawings, performance of verification inspection, etc.
 - d. Describe stamping activities (i.e., which stamps are used for what).
 - e. Describe source acceptance.
 - f. Describe the process for rejection of submitted material using a Quality Assurance Defect Report (QADR).
8. **Weapon Quality Assurance Specialists shall demonstrate a working level knowledge of product specification/design agency requirements (drawings).**

Supporting Knowledge and/or Skills

- a. Describe the applicable production specifications used in weapon production.
- b. Describe the engineering authorizations identified in the Technical Business Practices (TBPs).
- c. Discuss the applicability of product specification use in verification inspection.
- d. Demonstrate ability to identify applicable product specifications and drawings.

Regulatory

9. **Weapon Quality Assurance Specialists shall demonstrate a working level knowledge of the NNSA quality assurance policy and other regulatory requirements contained in the following documents:**
- **10 CFR 830, Subpart A, *Quality Assurance***
 - **DOE O 414.1C, *Quality Assurance***
 - **DOE/NNSA 56XB, *Nuclear Weapon Development and Production Manual***

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- **DOE/NNSA *Weapon Quality Policy (QC-1)***
- **DOE/NNSA *Technical Business Practices***
- **DOE/NNSA *Quality Assurance Procedures Manual***

Supporting Knowledge and/or Skills

- a. Explain the hierarchy of NNSA and regulatory documents used in the Weapon Quality Assurance Program.
- b. Explain the purpose of each of the documents listed above.
- c. Discuss the responsibilities of the NNSA, production agencies, and design agencies for acceptance of weapons related product per the Quality Assurance Program Manual.

Management, Assessment, and Oversight

- 10. Weapon Quality Assurance Specialists shall demonstrate a working level knowledge of how to oversee the effective implementation of quality assurance criteria as contained in the following documents:**

- **DOE/NNSA *Weapon Quality Policy (QC-1)***
- **DOE/NNSA *Quality Assurance Procedures Manual (QAPM)***

Supporting Knowledge and/or Skills

- a. Discuss the Weapon Quality Assurance Specialist's role in effective oversight.
- b. Describe process(es) used to conduct oversight.

- 11. Weapon Quality Assurance Specialists shall demonstrate a working level knowledge of assessment requirements, principles and techniques as defined in the following documents.**

- **DOE/NNSA *Quality Assurance Procedures Manual***
- **DOE/NNSA *Weapon Quality Policy (QC-1)***
- **DOE O 414.1C, *Quality Assurance***
- **DOE G 414.1-1B, *Management and Independent Assessments Guide for use with 10 CFR 830, Subpart A, and DOE O 414.1C***

Supporting Knowledge and/or Skills

- a. Describe the different types and purpose of assessments.
- b. Describe performance methods/techniques.

Mandatory Performance Activities

- 12. Participate in a minimum of one product specification/design agency requirements (drawings) review.**

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13. **Participate in product acceptance activities using a QAIP or a survey.**
14. **Perform a minimum of one QAS 4 survey.**

Weapon Quality Assurance Engineer/Scientist

General Technical

1. **Weapon Quality Assurance Engineers/Scientists shall demonstrate a working level knowledge of product specification/design agency requirements (drawings).**

Supporting Knowledge and/or Skills

- a. Describe the applicable production specifications used in weapon production.
- b. Describe the engineering authorizations identified in the TBPs.
- c. Discuss the applicability of product specification use in verification inspection.

2. **Weapon Quality Assurance Engineers/Scientists shall demonstrate a working level knowledge of process control and statistical sampling methods for product inspection.**

Supporting Knowledge and/or Skills

- a. Discuss examples of process control used in weapon production processes.
- b. Discuss the statistical sample methods applicable to product acceptance used by the Quality Assurance Procedures Manual.

3. **Weapon Quality Assurance Engineers/Scientists shall demonstrate a working level knowledge of the DOE/NNSA 56XB, *Nuclear Weapon Development and Production Manual* and DOE/NNSA *Technical Business Practices* used to evaluate product and production quality and to qualify product and production methods, processes, and equipment.**

Supporting Knowledge and/or Skills

- a. Describe the requirements of the weapons program evaluation and qualification process.
- b. Discuss the methods for evaluation and qualification of product (e.g., destructive and non-destructive).
- c. Discuss how production processes/methods and equipment are evaluated and qualified.

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d. Demonstrate ability to locate and explain evaluation and qualification documentation.

4. Weapon Quality Assurance Engineers/Scientists shall demonstrate a working level knowledge of a nonconformance and the Suspect/Counterfeit Item Program identified in:

- **DOE O 414.1C, *Quality Assurance***
- **DOE/NNSA *Weapon Quality Policy (QC-1)***

Supporting Knowledge and/or Skills

- a. Discuss the purpose of the nonconformance and the Suspect/Counterfeit Item Program.
- b. Explain the process requirements for nonconforming material.
- c. Describe the requirements and method for reporting nonconforming material delivered between NNSA agencies.
- d. Describe the purpose for the disposition of nonconforming and suspect material/items.

5. Weapon Quality Assurance Engineers/Scientists shall demonstrate a working level knowledge of metrology and calibration used in the weapons program from the following documents:

- **DOE/NNSA 56XB, *Nuclear Weapon Development and Production Manual***
- **Primary Standards Laboratory Memorandum**
- **DOE/NNSA *Weapon Quality Policy (QC-1)***

Supporting Knowledge and/or Skills

- a. Describe the purpose of instrument and equipment calibration.
- b. Describe the function the Primary Standards Laboratory performs on behalf of NNSA.
- c. Discuss the measurements and control of calibrated instruments used in weapon production.

6. Weapon Quality Assurance Engineers/Scientists shall demonstrate a working level knowledge of SQA.

Supporting Knowledge and/or Skills

- a. Discuss the requirements for SQA specific to DOE/NNSA, *Weapon Quality Policy (QC-1)*.
- b. Identify the procedure/process used by the M&O contractor for SQA development,

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testing, use control, and error reporting and correction.

7. Weapon Quality Assurance Engineers/Scientists shall demonstrate a **working level knowledge** of geometric dimensions and tolerances.

Supporting Knowledge and/or Skills

- a. Explain the purpose and use of dimensions and tolerances.
- b. Demonstrate knowledge and use of the dimensions and tolerances on product drawings and specifications.

8. **Weapon Quality Assurance Engineers/Scientists shall demonstrate a working level knowledge of Federal product acceptance.**

Supporting Knowledge and/or Skills

- a. Describe the use of the Quality Instruction List (QIL).
- b. Describe the use of the Certification of Inspection (COI).
- c. Describe the verification inspection process including Quality Assurance Inspection Procedures (QAIPs), where the requirements come from, reviewing certification documentation, reviewing drawings, performance of verification inspection, etc.
- d. Describe stamping activities (i.e., which stamps are used for what).
- e. Describe source acceptance.
- f. Describe the process for rejection of submitted material using a Quality Assurance Defect Report (QADR).

Regulatory

9. **Weapon Quality Assurance Engineers/Scientists shall demonstrate a working level knowledge of the NNSA quality assurance policy and other regulatory requirements contained in the following documents:**

- **10 CFR 830, Subpart A, *Quality Assurance***
- **DOE O 414.1C, *Quality Assurance***
- **DOE/NNSA 56XB, *Nuclear Weapon Development and Production Manual***
- **DOE/NNSA *Weapon Quality Policy (QC-1)***
- **DOE/NNSA *Technical Business Practices***
- **DOE/NNSA *Quality Assurance Procedures Manual (QAPM)***

Supporting Knowledge and/or Skills

- a. Explain the hierarchy of NNSA and regulatory documents used in the Weapon Quality Assurance Program.

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- b. Explain the purpose of each of the documents listed above.
- c. Discuss the responsibilities of the NNSA, production agencies, and design agencies for acceptance of weapons related product per the Quality Assurance Procedures Manual.

Management, Assessment, and Oversight

10. **Weapon Quality Assurance Engineers/Scientists shall demonstrate a working level knowledge of assessment requirements, principles and techniques as defined by the following documents:**
 - *DOE/NNSA Quality Assurance Procedures Manual*
 - *DOE/NNSA Weapon Quality Policy (QC-1)*
 - *DOE O 414.1C, Quality Assurance*
 - *DOE G 414.1-1B, Management and Independent Assessments Guide for use with 10 CFR 830, Subpart A, and DOE O 414.1C*

Supporting Knowledge and/or Skills

- a. Describe the different types and purpose of assessments.
- b. Describe performance methods/techniques.

11. **Weapon Quality Assurance Engineers/Scientists shall demonstrate a working level knowledge of how to oversee the effective implementation of quality assurance criteria as contained in the following documents:**

- *DOE/NNSA Weapon Quality Policy (QC-1)*
- *DOE/NNSA Quality Assurance Procedures Manual (QAPM)*

Supporting Knowledge and/or Skills

- a. Discuss the Weapon Quality Assurance Specialist's role in effective oversight.
- b. Discuss the Weapon Quality Assurance Engineer/Scientist's role in effective oversight.
- c. Describe the process(es) used to conduct oversight.

Mandatory Performance Activities

12. **Participate in a minimum of one product specification and design agency drawing review.**
13. **Participate in product acceptance activities using a QAIP or a survey.**
14. **Participate/Perform at least one QAS 1.0, 3.0, and 4.0 Survey.**

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

The following list represents suggested continuing education, training, and other opportunities that are available for NNSA personnel after completion of the competency requirements in this technical FAQs. It is extremely important that personnel involved with this program maintain their proficiency primarily by regularly demonstrating their competency 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 FAQs 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 Weapon Quality Assurance Functional Area after completion of the competencies in the standard and other requirements of the TQP.

LIST OF CONTINUING EDUCATION, TRAINING, AND OTHER ACTIVITIES

1. Continuing technical education and/or training covering topics directly related to the Weapon Quality Assurance area as determined appropriate by management. This may include courses/training provided by DOE, other government agencies, outside vendors, or local educational institutions. Continuing training topics should also address identified weaknesses in the knowledge or skills of the individual personnel.
2. Actively perform the duties of Weapon Quality Assurance Specialist or Weapon Quality Assurance Engineer/Scientist at an NNSA site for a minimum of 0.75 full time equivalent per year.
3. Attend seminars, symposia, or technical meetings related to Weapon Quality Assurance as determined appropriate by management.
4. Engage in self-study of new regulations, requirements, or advances related to Weapon Quality Assurance in accordance with the site-specific program.
5. Participate in practical activities such as product acceptance, product definition reviews, and QASs.
6. Specific continuing training requirements shall be documented in the site-specific standard(s) and the Individual Development Plans (IDPs).

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CONCLUDING MATERIAL

Review Activity:

NNSA

Preparing Activity:

DOE-YSO

Project Number:

TRNG-0063

Site Offices

Kansas City Site Office

Livermore Site Office

Los Alamos Site Office

Nevada Site Office

Pantex Site Office

Savannah River Site Office

Sandia Site Office

Y-12 Site Office