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DOE-STD-1138-2000
July 2000

DOE STANDARD

INDUSTRIAL HYGIENE FUNCTIONAL AREA QUALIFICATION STANDARD

DOE Defense Nuclear Facilities Technical Personnel

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

AREA TRNG

APPROVAL

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

Chairman
Federal Technical Capability Panel

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ACKNOWLEDGMENT

The Office of Environment, Safety and Health is the Sponsor for the Industrial Hygiene Functional Area 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 industrial hygiene. 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 (SMEs) participated in the development and/or review of this qualification standard:

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U.S. DEPARTMENT OF ENERGY
FUNCTIONAL AREA QUALIFICATION STANDARD

FUNCTIONAL AREA:

Industrial Hygiene

PURPOSE

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

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

APPLICABILITY

The Industrial Hygiene Functional Area Qualification Standard establishes common functional area competency requirements for Department of Energy industrial hygiene personnel who provide assistance, direction, guidance, oversight, or evaluation of contractor technical activities having an impact on the safe operation of defense nuclear facilities. The technical functional area qualification standard has been developed as a tool to assist DOE program and field offices in the development and implementation of the Technical Qualification Program in their organization. Program and field offices may choose to use this technical functional area qualification standard as-is, or they may use parts of it to facilitate the development of their own unique technical qualification standards. In either case, satisfactory and documented attainment of the competency requirements contained in this technical functional area qualification standard or similar standards ensures that industrial hygiene personnel possess the requisite competence to fulfill their functional area duties and responsibilities. Office- or facility-specific qualification standards supplement this technical functional area qualification

standard and establish unique operational competency requirements at the headquarters or field element, site, or facility level.

IMPLEMENTATION REQUIREMENTS

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

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

> **Familiarity level** is defined as basic knowledge of or exposure to the subject or process adequate to discuss the subject or process with individuals of greater knowledge.
>
> **Working level** is defined as the knowledge required to monitor and assess operations/activities, to apply standards of acceptable performance, and to reference appropriate materials and/or expert advice as required to ensure the safety of Departmental activities.
>
> **Expert level** is defined as a comprehensive, intensive knowledge of the subject or process sufficient to provide advice in the absence of procedural guidance.
>
> **Demonstrate the ability** is defined as the actual performance of a task or activity in accordance with policy, procedures, guidelines, and/or accepted industry or Department practices.

Headquarters and Field elements shall establish a program and process to ensure that federal industrial hygiene personnel possess the competencies required of their position. That includes the competencies identified in this technical Functional Area Qualification Standard or a similar Standard developed by the organization. Documentation of the completion of the requirements of the Standard shall be included in the employee's training and qualification record.

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

Training shall be provided to employees in the Technical Qualification Program that do not meet the competencies contained in the technical Functional Area Qualification Standard. Departmental training will be based upon appropriate supporting knowledge and/or skill statements similar to the ones listed for each of the competency statements. Headquarters and

Field elements should use the supporting knowledge and/or skill statements as a basis for evaluating the content of any training courses used to provide individuals with the requisite knowledge and/or skill required to meet the technical Functional Area Qualification Standard competency statements. Undergraduate and graduate level industrial hygiene courses offered by the educational institutions listed in Appendix A may be supplemented by industrial hygiene courses at accredited institutions to meet the minimum requirements of OPM Occupation Series.

EVALUATION REQUIREMENTS

Attainment of the competencies listed in this technical functional area qualification standard should be documented by a qualifying official or the immediate supervisor of industrial hygiene personnel using any of the following methods:

CONTINUING EDUCATION, TRAINING AND PROFICIENCY

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

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

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

DUTIES AND RESPONSIBILITIES

The following are the typical duties and responsibilities expected of DOE defense nuclear facility technical personnel assigned to the industrial hygiene functional area:

1. Maintain communication with Headquarters, field elements, regulatory agencies, the public, and other stakeholders.

2. Inform Department of Energy management of applicable industrial hygiene project status, activities, and issues.

3. Plan, observe, and evaluate industrial hygiene activities and contractor performance to ensure the adequacy and effectiveness of contractor programs such as:

    - Technical performance
    - Plans, policies, and procedures
    - Management controls
    - Worker training and qualification programs
    - Occurrence reporting and corrective actions
    - Worker and public health and safety programs

4. Develop, review, and assess industrial hygiene documentation.

5. Develop, manage, and assist in the negotiations for regulatory agreements and permits.

6. Resolve or facilitate the resolution of industrial hygiene issues.

7. Develop, implement, and evaluate industrial hygiene strategic, baseline, project, and program plans.

8. Promote the sharing of information and technology.

9. Conduct site-specific technology implementation evaluations.

10. Evaluate the adequacy and effectiveness of Federal and contractor industrial hygiene programs to ensure program compliance with Department Orders, standards, and guides; Federal regulations, statutes, and codes; and applicable state and local regulations.

Additional duties and responsibilities specific to the site, facility, operational activities, and/or involved organizations shall be contained in the facility-specific qualification standard(s).

BACKGROUND AND EXPERIENCE

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

The preferred education and experience for industrial hygiene personnel is:

1. Education:

    Bachelor of Science degree in engineering, science, or a related discipline or meeting the alternative requirements specified for engineers, or scientists in the OPM Qualification Standards Handbook.

2. Experience:

   Industrial, military, Federal, State, or other directly related background that has provided specialized experience in industrial hygiene. Specialized experience can be demonstrated through possession of the competencies outlined in this standard.

REQUIRED TECHNICAL COMPETENCIES

Each of the competency statements defines the level of expected knowledge and/or skill that an individual must possess to meet the intent of this technical qualification standard. **The supporting knowledge and/or skill statements further describe the intent of the competency statements but are not requirements.**

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

Anticipation of Health Stressors Associated with the Workplace

1. Industrial hygiene personnel shall demonstrate a working level knowledge of health stressors that may be found in the workplace and the community.

Supporting Knowledge and/or Skills

a. Discuss the following types of health stressors and provide examples of hazards that may be anticipated.
- Chemical
- Biological
- Physical
- Ergonomic

b. Describe how the following sources of information can be used to assist in the anticipation of health stressors.
- Standards
- Regulations
- Standard texts and references
- Site Material Safety Data Sheet (MSDS) inventories

2. Industrial hygiene personnel shall demonstrate the ability to anticipate health stressors during the planning and design phases of a work activity or from an operational description.

Supporting Knowledge and/or Skills

a. Discuss how a review of the following can be used to anticipate potential health stressors.
   - Process raw materials
   - A description of process chemical reactions
   - Process products and by-products

- Process equipment
- Process operating procedures

b. In planning a work activity, anticipate the ergonomic hazards that may result from the following:
   - Workplace/equipment/tool design
   - Repetitive motion tasks
   - Work/rest cycle
   - Temperature and other environmental extremes

c. Read and interpret relevant portions of design drawings, plans, and specifications.

Recognition of Health Stressors Associated with the Workplace

3. Industrial hygiene personnel shall demonstrate a working level knowledge of study and observation methods required to recognize and evaluate potential workplace health stressors.

Supporting Knowledge and/or Skills

a. Discuss how the presence and use of existing control measures affect the evaluation of health stressors.

b. Describe how the following sensory indications may help with the identification of exposures.

   - Odor
   - Hearing
   - Sight
   - Touch

4. Industrial hygiene personnel shall demonstrate a working level knowledge of occupational illnesses and their sign and symptoms and what their presence may indicate about past and current workplace exposure.

Supporting Knowledge and/or Skills

a. Discuss common signs and symptoms that may demonstrate an occupational illness or exposure.

b. Describe the following occupational illnesses and explain their workplace cause:

   - Asbestosis
   - Mesothelioma
   - Pneumoconiosis
   - Dermatitis
   - Cumulative Trauma Disorder
   - Chronic Beryllium Disease
   - Dermatosis
   - Hypersensitivity Pneumonitis
   - Chronic Obstructive Lung Disease

- Occupational Asthma
- Bronchogenic Carcinoma
- Glomerulonephritis
- Cirrhosis of Liver
- Jaundice

c. Discuss the following basic epidemiological terms and provide examples of how each is used:

- Retrospective
- Case control
- Cohort

d. Discuss how a health and safety complaint should be investigated.

5. Industrial hygiene personnel shall demonstrate a working level knowledge of the recognition of potential ergonomic and office health hazards.

Supporting Knowledge and/or Skills

a. Ability to use accepted protocol to identify jobs with potential ergonomic problems.

b. Ability to recognize and evaluate the following potential ergonomic factors:

- Equipment/tool design and selection
- Work layout
- Visual displays
- Work/rest cycles
- Work area illumination and color
- Human capacity/job demands
- Requirement for manual handling
- Alternative work schedules and shift work

c. Ability to recognize and evaluate the following with respect to indoor air quality:

- Temperature and humidity control
- Proper heating, ventilation, and air conditioning (HVAC) design and maintenance
- HVAC filter selection
- Risk communication skills
- Introduction of sources of air contaminants into the office environment
- Water leaks

Evaluation of Health Stressors Associated with the Workplace

6. Industrial hygiene personnel shall demonstrate a working level knowledge of data collection plans for collecting data that accurately reflect exposure conditions.

Supporting Knowledge and/or Skills

a. Discuss the following factors as they relate to sampling strategy:

- Usefulness of bulk samples
- Degree to which operations being sampled are representative of normal conditions
- Duration of sample
- Level of detectability
- Exposure control methods in use during sampling
- Sample handling
- Data recording and management
- Sample chain of custody
- Statistical significance of sample
- Exposure criteria and limits
- Consent needs for biological samples
- Uses and limitations of personal and area sampling

7. Industrial hygiene personnel shall demonstrate a working level knowledge of sampling techniques.

Supporting Knowledge and/or Skills

a. Describe the significance of instrument calibration and operation and data collection methods during sampling.

b. Describe how multiple exposures affect sampling techniques.

c. Describe the factors (e.g., concentration, duration, frequency) that determine the adequacy of samples

d. Describe how environmental factors (e.g., wind, rain, temperature extremes) affect the need for further sampling.

8. Industrial hygiene personnel shall demonstrate a working level knowledge of sample analysis, including the use of appropriate laboratory techniques.

Supporting Knowledge and/or Skills

a. Describe the following:

- Selection of proper analytical instruments and techniques
- Sensitivity and specificity of the analytical technique
- Precision versus accuracy
- Instrument bias
- Interferences in sampling
- Principles of instrument operation

b. Discuss laboratory data recording requirements.

c. Discuss the fundamentals of operating analytical equipment, including zeroing and the use of standards.

d. Discuss the following laboratory concerns and their effect on sample analysis.

- Quality assurance
- Chain of custody (samples and results)
- Physical security of samples
- Personnel safety
- Equipment maintenance
- Laboratory management

e. Discuss the value and limitations of sampling during indoor air quality investigations for the following:

- Environmental conditions
- Chemical exposure
- Bioaerosols

9. Industrial hygiene personnel shall demonstrate a working level knowledge of the analysis and interpretation of sample results.

Supporting Knowledge and/or Skills

a. Discuss how the following are used in the analysis of sampling results:

- Mathematical and statistical computations
- Units and conversions

b. Discuss how the following affect the significance of exposures.

- Selection of exposure criteria (e.g., action levels)
- Individual susceptibility to identified hazards
- Importance of non-occupational exposures
- Other occupational exposures
- Biological sampling results
- Worker population demographics

c. Discuss the role standards, guidelines, and legal requirements have on analyzing and interpreting results.

d. Discuss the methods of sampling and their limitations for the following:

- Heat stress (ambient conditions and biological monitoring)
- Ergonomic hazards
- Bioaerosols

Control of Health Stressors in the Workplace

10. Industrial hygiene personnel shall demonstrate a working level knowledge of the methods used to educate people about how to protect themselves from health stressors.

Supporting Knowledge and/or Skills

a. Discuss the importance of the following as they relate to employee training in industrial hygiene:

- Regulatory training and educational content requirements
- Qualifications and credibility of course instruction
- Audience receptivity of educational materials, format, and classroom conditions
- Audience educational level and language skills
- Bottom-line goals of the education being provided

b. List the fundamental assumptions of public and workplace risk communication and explain in general both how risk should be explained to a nontechnical audience and what should be avoided in risk communication.

c. Identify the potential non-occupational hazards associated with employee lifestyle that may contribute to occupational illness.

11. Industrial hygiene personnel shall demonstrate a working level knowledge of personal protective equipment (PPE) programs for controlling exposure, including their use and limitations.

Supporting Knowledge and/or Skills

a. Discuss how to recognize when personal protective equipment is an acceptable and appropriate alternative to other control mechanisms.

b. Discuss how to recognize when PPE is a necessary companion to other control measures.

c. Discuss the selection, use, maintenance, limitations, and capabilities of respiratory equipment and other types of PPE (e.g., eye protection, protective clothing, personal hearing protection).

d. Discuss how the properties of absorption, adsorption, and filtration mechanisms (respiratory protection) affect the selection of PPE.

e. Describe the major elements of the hearing conservation program.

f. Discuss limitations in the use of personal protective equipment.

g. Discuss how codes, regulations, standards, and certification procedures affect the use of PPE.

h. Discuss the difficulties of optimizing PPE in a complex, multiexposure environment.

i. Discuss the use and limitations of PPE in a heat stress environment.

12. Industrial hygiene personnel shall demonstrate a working level knowledge of the design of engineering measures to control exposure.

Supporting Knowledge and/or Skills

a. Discuss basic design principles for heating, ventilation, and air conditioning (HVAC) systems, including the following:

- Local exhaust ventilation
- Dilution ventilation
- Air recirculation
- Make-up air supply

b. Describe the design principles and performance of air cleaners and explain the roles they play in minimizing worker exposure to chemicals and biological hazards.
c. Discuss the interpretation and applicability of regulations and standards governing ventilation systems.

d. Describe the following environmental factors:

- Atmospheric dispersion modeling
- Control of hypo- and hyper-baric conditions
- Psychometry

e. Discuss the principles of isolation and enclosure as they relate to the following:

- Noise
- Air contaminants
- Radiation

f. Discuss the economic feasibility parameters of the following:

- Engineering controls, including process change and substitution
- Administrative controls
- Personnel protective equipment

g. Discuss how engineering controls may be implemented for each of the following:

- Non-ionizing radiation
- Ionizing radiation
- Noise
- Vibration
- Repetitive motions
- Lifting heavy objects
- Biological hazards
- Heat and humidity
- Cold stress

h. Describe the control features (e.g., backflow prevention) of potable water supply distribution.

i. Discuss the importance of engineering controls as they relate to sanitation of food service facilities and equipment.

13. Industrial hygiene personnel shall demonstrate a working level knowledge of the design of administrative measures to control exposure or protect employees.

Supporting Knowledge and/or Skills

a. Describe how the following administrative measures may contribute to exposure control:

- Procedural modifications (work practices)
- Operations and scheduling
- Standard operating procedures
- Reduction of exposure time
- Work/rest regimen for heat stress control
- Personal hygiene practices
- Promoting and implementing good housekeeping practices

b. Discuss how the following may be needed to implement effective exposure control:

- Medical surveillance of exposed employees
- Medical removal protection for sensitive workers
- Genetic screening
- Preplacement exams and periodic medical screening

14. Industrial hygiene personnel shall demonstrate a working level knowledge of the methods used to communicate control action recommendations.

Supporting Knowledge and/or Skills

a. Describe how to prepare a technical report.

b. Discuss major record keeping requirements.

c. Discuss how to describe and recommend preferred control measures (including the desired hierarchy of controls), alternatives, and/or interim control measures.

d. Discuss development of a schedule for the implementation of control measures.

e. Discuss how the safety aspects of a required task, and the imposition of controls and their related costs necessary for safety during the task, may affect management's prioritization of work or the completion of work that is affected by that task.

Management of Industrial Hygiene Programs

15. Industrial hygiene personnel shall demonstrate a working level knowledge of industrial hygiene programs.

Supporting Knowledge and/or Skills

a. Describe the major components of sound industrial hygiene programs.

b. Discuss management of industrial hygiene resources.

c. Discuss the impact of legal requirements.

d. Discuss the implications of noncompliance.

e. Discuss how industrial hygiene programs relate to other environmental, safety, and health programs, and to the broad goals of protecting not only the worker, but also the public and the environment.

Professional and Ethical Issues

16. Industrial hygiene personnel shall demonstrate a working level knowledge of professional and ethical issues.

Supporting Knowledge and/or Skills

a. Discuss the Code of Ethics developed by the American Industrial Hygiene Association (AIHA), the American Conference of Governmental Industrial Hygienists (ACGIH), the American Board of Industrial Hygiene (ABIH), and the American Academy of Industrial Hygiene (AAIH).

b. Discuss the Adverse Actions section of the American Board of Industrial Hygiene (ABIH) Bulletin, current edition.

c. Discuss legal issues affecting the practice of Industrial Hygiene, including confidentiality of medical data and restraint of trade (antitrust).

d. Discuss ethical behavior in scientific data gathering and reporting.

e. Discuss personal ethical behavior, including the following:
   - Misrepresentation of qualifications and credentials
   - Conflict of interest

17. Industrial hygiene personnel shall demonstrate a familiarity level knowledge of the principle external committees, agencies, and associations relating to the field of industrial hygiene.

Supporting Knowledge and/or Skills

a. Describe the purpose and significance of the following:
   - American Industrial Hygiene Association (AIHA)

- American Conference of Governmental Industrial Hygienists (ACGIH)
- American Board of Industrial Hygiene (ABIH)
- American National Standards Institute (ANSI)
- Mine Safety and Health Administration (MSHA)
- Occupational Safety and Health Administration (OSHA)
- Environmental Protection Agency (EPA)
- National Institute of Occupational Safety and Health (NIOSH)

18. Industrial hygiene personnel shall demonstrate the ability to evaluate the adequacy of local compliance with the following document sections:

29 CFR 1910, Occupational Safety and Health Standards such as the following:

- Subpart G — Occupational Health and Emergency Response
- Subpart H — Hazardous Materials (including 1910.120 — Hazardous waste operations and emergency response)
- Subpart I — Personal Protective Equipment
- Subpart J — General Environmental Controls (including 1910.146 — Permit-required confined spaces)
- Subpart K — Medical and First Aid
- Subpart Q — Welding, Cutting, and Brazing
- Subpart Z — Hazardous Substances (including 1910.1020 — Access to employee exposure and medical records)

29 CFR 1926, Safety and Health Standards such as the following:

- Subpart D — Occupational Health and Environment Control
- Subpart E — Personal Protective and Life Saving Equipment
- Subpart H — Material Handling, Storage, Use, and Disposal
- Subpart J — Welding and Cutting
- Subpart Y — Record keeping
- Appendixes A&B to Subpart Y — Examples of conditions that may restrict or limit exposure to hyperbaric conditions and guidelines for scientific diving
- Subpart Z — Toxic and Hazardous Substances

Industrial hygiene-related technical standards such as the following:

- 10 CFR 850 — Chronic Beryllium Disease Prevention Program; Proposed Rule
- 40 CFR 763 — Asbestos
- ANSI Z88.2 — Practices for Respiratory Protection
- ANSI Z88.6 — Respiratory Protection, Respirator Use, and Physical Qualifications for Personnel
- ANSI Z136.1 — Safe Use of Lasers
- ANSI Z117.1 — Safety Requirements for Working in Tanks and Other Confined Spaces
- ANSI Z358.1 — Emergency Eyewash and Shower Equipment
- ANSI C95.1 — Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz
- ACGIH TLV Booklet — American Conference of Governmental Industrial Hygienists Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices.

Supporting Knowledge and/or Skills

a. Describe the purpose, scope, and application of the requirements detailed in the listed document sections.

b. Discuss the process by which Department line management determines an appropriate level of coverage by industrial hygienists. Include in this discussion factors that may influence the level of coverage.

c. Discuss what constitutes acceptable contractor work performance consistent with the requirements of the above regulations and technical standards.

d. Using selected sections from 29 CFR 1910, 29 CFR 1926, and technical standards, prepare an action plan that adequately outlines interviews and observations to conduct, and details documents to review, during an evaluation of contractor compliance against the requirements of the selected sections.

e. Using an appropriate level of coverage, evaluate contractor compliance with the requirements of selected sections of 29 CFR 1910, 29 CFR 1926, and technical standards. During this evaluation, demonstrate the ability to conduct interviews, make observations, and review documents properly.

f. Given data from an evaluation, analyze the results of the evaluation to determine contractor compliance or noncompliance with the requirements.

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

19. Industrial hygiene personnel shall demonstrate the ability to determine the adequacy of local compliance with the industrial hygiene-related sections and/or requirements of Department of Energy (DOE) Orders such as the following:

- DOE O 151.1, “Planning and Preparedness for Operational Emergencies”
- DOE O 232.1A, “Occurrence Reporting and Processing of Operations Information”
- DOE O 440.1A, “Worker Protection Management for DOE Federal and Contractor Employees”
- DOE N 440.1, “Interim Chronic Beryllium Disease Prevention Program” (Notice)
- DOE G 440.1–7, “Interim Chronic Beryllium Disease Prevention Program” (Implementation Guide)
- DOE O 3790.1B, “Federal Employee Occupational Safety and Health Program”
- DOE O 5480.4, “Environmental Protection, Safety, and Health Protection Standards”
- DOE O 5480.19, “Conduct of Operations Requirements for DOE Facilities”
- DOE O 5480.20A, “Personnel Selection, Qualification, and Training Requirements for DOE Nuclear Facilities”
- DOE O 5480.22, “Technical Safety Requirements”
- DOE O 5480.23, “Nuclear Safety Analysis Reports”
- DOE O 5484.1, “Environmental Protection, Safety, and Health Protection Information Reporting Requirements”

Supporting Knowledge and/or Skills

a. Describe the purpose, scope, and application of the requirements detailed in the listed Orders and guides with respect to industrial hygiene.

b. Discuss what constitutes acceptable contractor compliance and work performance consistent with the requirements and recommendations of the Orders and guides above.

c. Using an appropriate level of coverage, evaluate contractor compliance with the requirements of the selected Orders. During this evaluation, demonstrate the ability to conduct interviews, make observations, and review documents properly.

d. Given data from an evaluation, analyze the results of the evaluation to determine contractor compliance or noncompliance with the requirements.

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

20. Industrial hygiene personnel shall demonstrate a familiarity level knowledge of industrial hygiene-related data management requirements.

Supporting Knowledge and/or Skills

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

Assessment and Appraisal Performance

21. Industrial hygiene personnel shall demonstrate a working level knowledge of assessment performance, including assessment planning and the use of field observations, employee interviews, and document reviews in the assessment of industrial hygiene performance.

Supporting Knowledge and/or Skills

a. Describe the role of an industrial hygienist with respect to oversight of contractor-operated Department of Energy facilities and operations.

b. Describe the assessment requirements and limitations associated with the interface with contractor employees.

c. Describe the action to be initiated or taken if the contractor challenges the assessment findings, and explain how such challenges may be avoided.

d. Demonstrate knowledge of assessment performance through the completion of at least one assessment in accordance with the local DOE procedures, practices, and

expectations. The scope of the assessment shall encompass site specific methods of hazard analysis and employee exposure assessment.

Assessment Report Preparation

22. Industrial hygiene personnel shall demonstrate the ability to prepare assessment reports that document assessment results, support assessment conclusions, and clearly communicate conclusions and recommendations for corrective action.

Supporting Knowledge and/or Skills

a. Ability to distinguish between compliance-based and performance-based assessments.

b. Completion of an assessment appraisal report. The appraisal report shall be completed in the local DOE format or in accordance with local procedures, practices, and expectations. The report shall demonstrate specific knowledge of the site's methods of hazard analysis and employee exposure assessment.

c. Ability to develop corrective actions and recommendations and communicate these to contractor management.

23. Industrial hygiene personnel shall demonstrate the ability to trend and analyze industrial hygiene-related information.

Supporting Knowledge and/or Skills

a. Identify and discuss the principal performance indicators that are normally used to review industrial hygiene performance and effectiveness.

b. Trend and analyze relevant facility operations information and discuss the relationship of operations information to industrial hygiene performance.

24. Industrial hygiene personnel shall demonstrate a working level knowledge of the interrelationship between quality assurance programs and industrial hygiene.

Supporting Knowledge and/or Skills

a. Describe how an industrial hygiene program may be evaluated for quality assurance activities, including the following:
   - Industrial hygiene program procedures
   - Sampling methods and chain of custody
   - Laboratory accreditation
   - Evaluation and maintenance of documentation
   - Independent verification
   - Technical staff qualifications

25. Industrial hygiene personnel shall demonstrate the ability to apply recognized technical practices and guidance properly to DOE nonindustrial or nonrepetitive work activities.

Supporting Knowledge and/or Skills

a. Ability to apply DOE Order and standards logically and appropriately to environmental management and restoration sites.

b. Ability to apply industrial hygiene technical practices to the DOE Integrated Safety Management (ISM) initiative and its validations.

APPENDIX A
LIST OF CONTINUING EDUCATION, TRAINING, AND OTHER ACTIVITIES

Appendix A will be developed at a later date and is not included as part of the initial issuance of the standard.

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CONCLUDING MATERIAL

Review Activity:

DOE
DP
EH
EM
NE
NN
SC

Field Offices
AL
CH
ID
NV
OR
RL
OAK
SR
Fernald

National Laboratories
BNL
LLNL
LANL
PNL
Sandia

Area Offices
Amarillo Area Office
Kirtland Area Office
Princeton Area Office
Rocky Flats Area Office

Preparing Activity:
DOE–EH–51

Project Number:
TRNG–0012